September 2024

The Role of Data Exchange in Financial Inclusion

Lessons from Leading Markets and Emerging Policy Approaches

AUTHORS | Edoardo Totolo, Ivan Mortimer-Schutts, Alex Rizzi, Colin Rice, and Anindita Chakraborty

CENTER *for* FINANCIAL INCLUSION | ACCION

CENTER *for* FINANCIAL INCLUSION | ACCION

ACKNOWLEDGEMENTS

The authors extend their sincere gratitude to the Bill and Melinda Gates Foundation for their generous support of this project. We are particularly thankful to Ariadne Plaitakis and Hillary Miller-Wise for their invaluable guidance throughout the process. We also wish to acknowledge the editorial assistance provided by Aeriel Emig and Rima Patel, and express our appreciation to Natasa Goronja for her overall guidance and Jayshree Venkatesan for her insightful inputs. Any errors in this report are the responsibility of the authors.

Executive Summary

The ability to exchange a wide range of data about consumers, SMEs, and their activities can enable financial institutions to design more efficient and personalized services, positioning data exchange as a key driver of future financial inclusion efforts. Over the past few decades, data exchange has transformed from basic credit information sharing to more advanced frameworks such as open banking, open finance, and open data initiatives. Today, approximately 68 countries, representing about 35 percent of the world's nations, are either implementing or developing these frameworks. This report provides an in-depth analysis of the current state of data exchange, with a particular focus on four leading markets — Brazil, the EU, India, and Singapore — selected for their innovative and varied approaches in building robust data exchange ecosystems. This report provides a comprehensive overview of the experiences in the four markets analyzed. For detailed insights on the 11 data exchange initiatives covered across four markets, click here.

This report enhances the existing body of knowledge on data exchange by shifting the focus from foundational design elements to the practical challenges of implementation. While much attention has been given to the foundational design elements — for example, whether data sharing should be mandatory or voluntary and the standardization of APIs — this report explores the more intricate challenges that arise during the implementation phase in leading markets. The study shows that success is dependent on many factors, including incentivizing participation and addressing resistance from key stakeholders — particularly incumbent banks — and on enabling the creation of a vibrant ecosystem of third-party providers. The study also contributes to the literature by offering detailed case studies and insights into how these markets have addressed key barriers to financial inclusion and the policy choices they have made. The findings provide practical examples and emerging policy approaches, addressing a critical gap in research on the real-world application of data exchange and digital public infrastructure.

Key implementation barriers identified in this study include incentivizing incumbent banks to actively participate in data exchange, fostering a competitive ecosystem for third-party providers, ensuring interoperability across digital infrastructure layers, preventing the formation of data silos, and building trust through transparency and robust governance. The insights from understanding these barriers are crucial for various audiences, including policymakers, regulators, financial institutions, researchers, donor organizations, and financial inclusion programs.

Contents

01 Introduction

The role of data exchange in finance has been long debated, starting with early conversations about credit information sharing and secure transaction regimes and their role in financial inclusion. The core driver of this discussion goes back to a long-discussed debate in economics about information asymmetry as a key market failure in finance, and how a better system of data exchange could help address this failure. This discussion has evolved in recent years to include various applications in open banking, open finance, and open data initiatives.[1] Today, 68 countries, representing approximately 35 percent of the world's nations, have either implemented or are in the process of developing open banking or open finance frameworks.[2] Some markets such as India, the EU, and Singapore have launched initiatives to create interindustry interoperability, allowing data exchange in sectors such as agriculture, ecommerce, and trade to intersect with open finance initiatives.

Yet despite the global interest and growing momentum, we are still in the early stages of this transformation. Research published by CGAP in 2020 established a critical knowledge base about the foundational design features in open banking and their link to financial inclusion goals.[3] These foundational choices include whether data sharing should be mandatory or voluntary, whether governments should mandate the standardization of APIs,[4] and the types of data to include.

1 The Basel Committee on Banking Supervision (2019) describes open banking as "the sharing and leveraging of customer-permissioned data by banks with third party developers and firms to build applications and services." Expanding on this concept, open finance extends the sharing of customer-permissioned data beyond banks to include other financial institutions with third parties.

2 Konsentus. (2023). The World of Open Banking and Open Finance. https://www.konsentus.com/open-banking-world-map-oct-2023

3 This foundational work was extensively discussed in a seminal CGAP study in 2020: Plaitakis, A. & Stachen, S. (2020). Open Banking: How to Design for Financial Inclusion. https://www.cgap.org/research/publication/open-banking-how-to-design-for-financial-inclusion

4 APIs are sets of rules and protocols that allow different software applications to communicate with each other. In the context of financial services, APIs enable the secure exchange of data between banks, fintechs, and other third-party providers, facilitating services like open banking and personalized financial solutions.

As the implementation of open finance initiatives progresses, policymakers now face a range of additional barriers and key policy decisions with significant implications for financial inclusion. In markets like the EU, Singapore, India, and Brazil — often considered exemplars for their success in data exchange — regulators are grappling with a series of key policy choices and policy design issues for which best practices have yet to emerge. Key policy choices in the implementation stage include, among others, promoting participation among incumbent banks, enabling a vibrant ecosystem of third-party providers (e.g., data intermediaries, data aggregators, technology providers), and ensuring interoperability between different building blocks, such as various layers of digital public infrastructure, like digital ID and fast payments.

The goals of this report are threefold:

1. To provide an in-depth analysis of the different models of data exchange that have emerged in several leading markets, linking this discussion to the global discussions on digital public infrastructure;
2. To outline key barriers faced by leading markets in the implementation of data exchange initiatives, alongside the policy choices being adopted to address these barriers; and
3. To provide recommendations to policymakers, regulators, and other relevant stakeholders, with the aim of guiding future research in this domain by providing emerging evidence and insights from these advanced implementations.

The paper begins by providing a "primer" on data exchange, discussing the evolution of the data exchange over time, tracing its origins from early discussions on credit information sharing and secure transaction regimes to current conversations about open banking and open data economies. It presents findings from four leading markets — India, Brazil, Singapore, and the EU — that have adopted different models of data exchange. Following this, the paper explores the key choices that governments and regulators are currently grappling with. The paper concludes with recommendations for governments and suggestions for further research.

For more details on the data exchange platforms and initiatives analyzed in this study, see the companion paper Data Exchange Market Deep Dives: In-Depth Exploration of Data Exchange Models and Initiatives in Brazil, India, Singapore, and the European Union, available here.

02 Data Exchange in Inclusive Finance: A Primer

2.1 A BRIEF HISTORY

Data exchange in the financial sector has a long history, beginning with discussions on credit information sharing. A significant impediment to accessing credit is asymmetric information; firms and individuals seeking to borrow have better knowledge about their financial state and their ability and willingness to repay the loan than the lender. This asymmetry can result in adverse selection, where borrowers with less intention of repaying loans are more inclined to apply for them, and moral hazard, where borrowers utilize the borrowed funds in ways that do not align with the lender's interests. Seminal work by Stiglitz and Weiss[5] shows t hat in contexts of asymmetric information, the equilibrium interest rate causes demand for credit to exceed supply, resulting in credit rationing, where even borrowers willing to pay the market equilibrium interest rate cannot get a loan.

Credit information sharing has been a key focus in international development circles. Research by the World Bank indicates that the introduction of credit bureaus through credit information sharing reforms has positively impacted firm financing. These reforms have increased access to finance for small firms, reduced interest rates, and extended loan tenures.[6] As a result, numerous initiatives have been implemented to promote the establishment of credit bureaus in developing countries. Institutions such as the International Finance Corporation (IFC) and Financial Sector Deepening (FSD) programs in Africa have funded advisory services and technical assistance to support governments in these efforts.[7]

However, credit information sharing is not the only method of exchanging customer data that existed in the financial sector before the advent of open finance (see Figure 1). Secure transaction regimes emerged since the 1990s , introducing mechanisms like movable collateral registries and receivable

5 Stiglitz, J., & Weiss, A. (1981). Credit Rationing in Markets with Imperfect Information. The American Economic Review, 71(3), 393-410. https://www.jstor.org/stable/1802787

6 Martinez Peria, M., & Singh, S. (2014). The Impact of Credit Information Sharing Reforms on Firm Financing. World Bank. https://openknowledge.worldbank.org/server/api/core/bitstreams/eea27746-1fcd-5a12-b94b-94b71a9e00cd/content

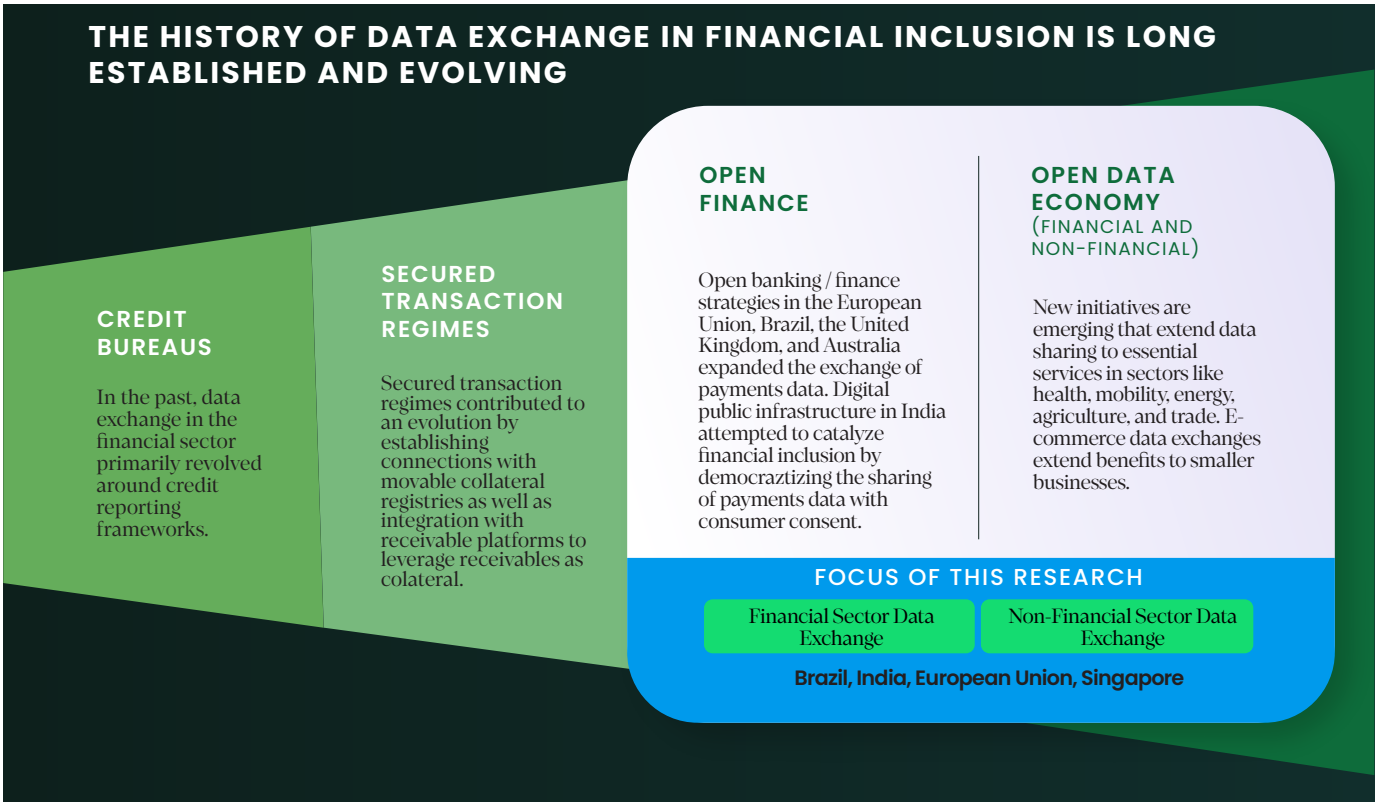
7 Gwer, F. (2023, March 21). Credit, where it is due: Kenya's credit information sharing journey. FSD Kenya. https://www.fsdkenya.org/blogs-publications/blog/credit-where-it-is-due-kenyas-credit-information-sharing-journey/; IFC. (n.d.). Focus Area: Credit Infrastructure. Retrieved January 2024, from https://www.ifc.org/en/what-we-do/sector-expertise/financial-institutions/credit-infrastructure#tabs-a8372c7846-item-c11d01d478-tab

platforms.[8] These systems, while not purely data exchange platforms, relied heavily on the exchange of data to function effectively. They improved information flows regarding collateral and invoices, thereby enhancing the ability of lenders to assess and secure financing against movable assets. Integrating these legacy systems with new open finance initiatives ensures a cohesive and comprehensive approach to data exchange in the financial sector.

In recent years, open banking has gained prominence, enabling data exchange about accounts and payments. This model has been implemented in various jurisdictions such as the European Union, Australia, the United Kingdom, and Brazil, among others. Open banking represents a significant shift as it allows third-party providers (TPPs) to access financial data with consumer consent, promoting competition and innovation in financial services.

The trajectory now extends from open banking to open finance, encompassing a broader range of financial services, including insurance, investments, and pensions. The current focus, as analyzed in this study, is toward an open data ecosystem. This ecosystem involves interoperability with sectors beyond finance, such as agriculture and the digital economy, where finance serves as one input to the real economy. This broader integration aims to harness data from various sectors to drive financial inclusion and economic development.

FIGURE 1: A HISTORY OF DATA EXCHANGE IN THE FINANCIAL SECTOR



8 For more information, see: Wilson et al. (2019). Secured Transactions, Collateral Registries and Movable Asset-Based Financing : Knowledge Guide (English). World Bank. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/193261570112901451/knowledge-guide

2.2 DATA EXCHANGE AS A KEY COMPONENT OF DIGITAL PUBLIC INFRASTRUCTURE

Data exchange is one piece of a broader ongoing conversation around digital public infrastructure (DPI). DPI recently came into focus as a topic of public discussion during India's 2023 G20 presidency, when it was prioritized and resulted in a G20 endorsement of DPI as a means to achieve the Sustainable Development Goals.[9] Over the past year, DPI has attracted significant interest globally, leading to numerous new studies and implementation initiatives. These efforts aim to explore the potential of DPI in enhancing digital inclusion, improving service delivery, and fostering economic growth across various sectors.[10]

DPI is built upon three foundational layers (see Figure 2) that work together to enable secure and efficient digital interactions.

FIGURE 2: THE THREE LAYERS OF DIGITAL PUBLIC INFRASTRUCTURE

digital ID systems like Aadhaar in India and Singpass in Singapore. These systems provide citizens with unique identifiers, enhancing security and accessibility through methods like biometric authentication and simplifying access to a wide range of services.

The second layer is **payments**, supported by robust systems like UPI in India, Pix in Brazil and PayNow in Singapore. These payment systems allow citizens to conduct financial transactions seamlessly and support various payment methods, ensuring that financial services are accessible and convenient for all users.

The third layer, and a critical yet less frequently discussed component, is **consent-based data exchange.** This layer involves frameworks that facilitate the secure sharing of personal or financial data with user consent, empowering consumers and businesses. Examples include account aggregato rs in India (see Box 1) and open finance initiatives in Brazil and the U.K. By giving users control over their data, these frameworks enable informed financial decisions and access to tailored financial products.

While identity and payment systems are often highlighted in discussions about DPI, data exchange systems play an equally vital role by enabling the secure and efficient flow of information across financial and non-financial sectors. This enhances the development of financial products and services and empowers users. For instance, Agri Stack in India leverages agricultural

9 UNDP. (2023, August 19). G20 Digital Ministers Recognize Digital Public Infrastructure as an Accelerator of the Global Goals [Press release]. https://www.undp.org/press-releases/g20-digital-ministers-recognize-digital-public-infrastructure-accelerator-global-goals

10 For an overview on DPI, see: Rizzi, A., Totolo, E., Venkatesan, J., & Michaels, L. (2024). Responsible DPI for Improving Outcomes Beyond Inclusion. Center for Financial Inclusion. https://www.centerforfinancialinclusion.org/responsible-dpi-for-improving-outcomes-beyond-inclusion/

data to provide better financial services to farmers, while platforms like ONDC in India and SGTraDex in Singapore f acilitate ecommerce and trade by enabling seamless data sharing among different entities. These examples are covered in detail in the Data Exchange Market Deep Dives report available at [link placeholder]. The interaction between financial and non-financial data exchanges is proving to be very important for the scaling of open finance to underserved segments of the economy — a topic rarely analyzed in the literature. It is discussed in more depth in Chapter 3.

Box 1: The Account Aggregator Framework in India

India's account aggregator (AA) framework represents a novel approach to open banking and financial data sharing. Launched in 2021 and regulated by the Reserve Bank of India (RBI), this framework is designed to give individuals and businesses greater control over their financial data.

Key elements of the AA framework include:

- **Consent-Based Data Sharing:** Users can securely share their financial information across institutions through AAs, but only with their explicit consent, ensuring privacy and control.[11]
- **RBI-Regulated Entities:** Account aggregators are licensed as non-banking financial companies (NBFC-AAs) by the RBI, ensuring they operate under strict regulatory oversight.
- **API-Based Infrastructure:** The framework employs open APIs to enable seamless data transfer between financial information providers (FIPs) and financial information users (FIUs), facilitating efficient and secure transactions.
- **Financial Inclusion:** By supporting cash flow-based lending, the AA framework aims to improve credit access for underserved segments, particularly micro, small, and medium enterprises (MSMEs).
- **Ecosystem Participants:** The AA network includes major public and private sector banks, as well as regulatory bodies like SEBI, demonstrating broad industry support.

The World Bank has recognized India's AA framework as a significant innovation in financial services, emphasizing its potential to enhance financial inclusion and streamline lending processes. By 2023, the AA ecosystem had grown to include over 1.1 billion AA-enabled accounts and 2.05 million users actively sharing their financial data.

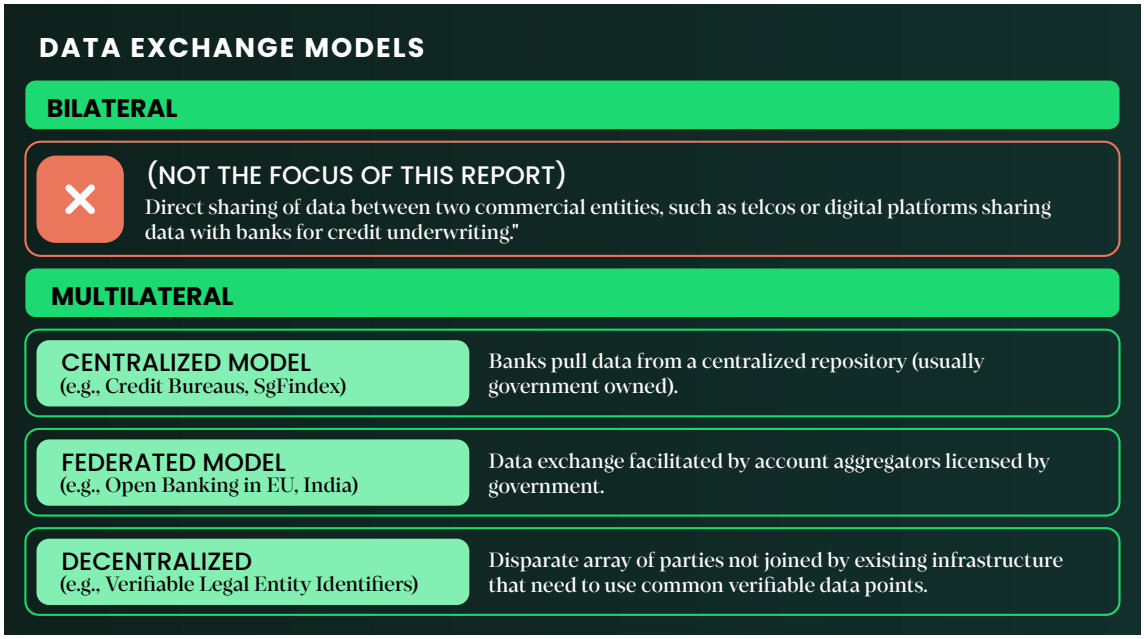
11 See more details at https://sahamati.org.in/

2.3 MODELS OF DATA EXCHANGE

The term "data exchange" is broad and encompasses various models, each with distinct characteristics and applications. Understanding these models is crucial for appreciating the complexity and potential of data exchange initiatives in inclusive finance.

CFI breaks data exchange models into two categories: bilateral and multilateral models (see Figure 3). **Bilateral models** involve a direct exchange of data between two parties, such as a telecommunications company sharing customer data with a bank to develop credit products. While crucial for many embedded finance models, this report does not focus on bilateral exchanges because, in many cases, these agreements are not scalable nor do they distribute gains from data sharing efficiently or equitably. Data often remains isolated within its original platforms, creating barriers to its application outside of corporate groups.[12] Instead, we focus here on the multilateral models of data exchange, which refer to frameworks that facilitate the sharing of data among multiple parties under the consent of consumers, ensuring interoperability, standardization, and mutual benefits for participants involved.

FIGURE 3: TYPES OF DATA EXCHANGE MODEL



There are three types of multilateral models: centralized, federated, and decentralized.

1. **Centralized Models:** In these models, a central authority, often a government entity, manages a central data repository. Financial institutions and other stakeholders can access this repository to retrieve data. An example is Singapore's SGFinDex, which allows banks to pull data from a government-managed repository.

12 Croxson, C., Frost, J., Gambacorta, L., & Valletti, T. (2021). Platform-based business models and financial inclusion. Bank for International Settlements. https://www.bis.org/events/20211006_bigtech/croxson.pdf

2. **Federated Models:** These models do not involve a single central repository. Instead, data is managed by licensed intermediaries such as account aggregators. Examples include the EU's account information service providers (AISPs) and India's account aggregator ecosystem. These intermediaries facilitate data exchange by aggregating and managing data from multiple sources.

3. **Decentralized Approaches:** This model involves a network of disparate parties that use common verifiable data points to facilitate data exchange without a centralized infrastructure. An example is the use of verifiable legal entity identifiers (vLEIs), which ensure that data is trustworthy and verifiable across different entities.

2.4 DATA EXCHANGE IN THE FINANCIAL SECTOR: OPEN BANKING AND OPEN FINANCE

Open banking initiatives provide controlled third-party access to consumer data regarding activities at financial institutions. While there are different scopes of application for the data, use cases tend to focus on enabling consumers to provide permission-based access to account balance and transaction records as well as KYC data across different types of accounts and assets. Open banking arrangements are still at an early stage of development. We have reviewed information about select markets and institutions to take stock of learnings to date and implications for inclusive finance.

Alongside other markets such as Australia, Israel, and the U.K., the EU, India, and Brazil have taken steps in varying degrees to foster access not only by banks but also new third partie s to bank-held consumer data. Other markets have been more conservative in initially focusing on incumbent financial institutions before potentially opening the market further to new non-bank actors.

A review of the four exemplar markets (see Table 1) included in this study identifies three primary policy approaches to enabling open finance type data exchanges:

1. **Regulatory-driven models** as seen in the EU and Brazil, where formal regulations set the framework for data sharing. This approach typically involves specific legislation and guidelines that define how data can be exchanged between entities.

2. **Use case-driven models** as exemplified by Singapore and, to some extent, the U.S. and other markets without stringent regulations. This model focuses on providing guidance and fostering environments conducive to bilateral data sharing. In these markets, the evolution of data exchange is often organic and driven by practical needs and specific use cases rather than predefined regulatory structures. Unregulated practices like screen-scraping are more common in such environments.

3. **Technology-driven models** as illustrated by India, where the development of a technology stack and related protocols acts as the foundation for data exchange. In this model, the technology infrastructure comes first, setting the stage for subsequent regulatory and governance frameworks to emerge.

Each of these models presents unique advantages and challenges, reflecting the diverse strategies countries can adopt to enable effective data exchange within their financial ecosystems. While the paths differ, there is potential for these models to eventually converge, particularly as data sharing becomes more ingrained in banking practices. As data exchange becomes routine and integrated across various sectors, the need for strict regulatory enforcement may diminish, with market forces and competition driving the expansion to a broader range of data sets and financial products. This evolution could see the initial regulatory tools and incentives used to encourage compliance becoming less critical as the ecosystem matures and adapts to new demands.

TABLE 1: SUMMARY COMPARISON OF OPEN BANKING ARRANGEMENTS

PHASE	INDIA	EU	SINGAPORE	BRAZIL
Policy Drivers	Innovation and inclusion	Competition and innovation	Innovation and efficiency	Innovation, competition, efficiency, and inclusion
Key Legislation	RBI has issued guidelines for the registration and operation of NBFC account aggregators (AAs), detailing the requirements and processes necessary to obtain AA licenses.	PSD2 and GDPR are the cornerstone regulations, with upcoming updates including PSD3 and the Financial Data Access (FIDA) framework.	There is no specific legislation on open banking. Personal Data Protection Act came into effect in phases starting from January 2013.	Governed by Central Bank Resolutions alongside the General Data Protection Law (LGPD).
Types of Data	A wide array of banking deposit and securities data related to customer assets.	Payment account balances and transactions, but now expanding.	Bank balances, assets including retirement funds.	Broad array of product, service, channel, account, and transaction data, coupled with payment initiation.
Role of Intermediaries	Account aggregators manage consent and flow of data. They are required to be "data-blind," meaning they cannot store, process or sell user data. They act solely as intermediaries.	Data intermediaries need an AISP license under PSD2 to aggregate and share financial data.	No specific licensing; data intermediaries operate based on industry guidelines and agreements.	No specific licensing for data intermediaries, but they enable data exchange under open finance guidelines.

PHASE	INDIA	EU	SINGAPORE	BRAZIL
Governance	Governed by the Reserve Bank of India, with Sahamati acting as an industry association to promote self-regulation and best practices.	Overseen by national regulators with coordination from the European Banking Authority, ensuring compliance with PSD2 and GDPR. No central authority for operating APIs or reporting.	Primarily governed by the Monetary Authority of Singapore, which sets guidelines and oversees compliance through industry collaboration.	Managed by a governance structure led by the Central Bank of Brazil, involving multiple stakeholder councils for decision making.

The study analyzed data exchange initiatives in exemplar markets — Brazil, the EU, India, and Singapore — each adopting distinct strategies.

We define India's approach as a technology-driven, "platform-first" approach. It leverages digital public infrastructure within a techno-legal framework[13] and is supported by account aggregators. This method prioritizes building a robust digital infrastructure before implementing comprehensive regulatory frameworks. Notably, India developed its data exchange framework before passing its data protection legislation — the Digital Personal Data Protection Act of 2023.

This is different from the approach taken in most other countries. The European Union has taken a regulation-driven approach, which began with the General Data Protection Regulation (GDPR) in 2018 to establish a stringent baseline for data protection. This was followed by initiatives like the Payment Services Directive 2 (PSD2), which created a framework for third-party providers to access and use financial data, thus facilitating financial data exchange within a highly regulated environment.

Singapore's model is driven by public-private partnerships (PPPs), focusing on practical implementations like Singapore Financial Data Exchange (SGFinDex). SGFinDex enables individuals to consolidate their financial information from various banks and government agencies using their national digital identity (Singpass), providing a unified view of their financial health. This approach, which operates without comprehensive legislation, relies heavily on partnerships to drive innovation and implementation. The Monetary Authority of Singapore (MAS) plays a crucial role in coordinating these efforts and ensuring that stakeholders align with the broader strategic vision. However, the challenge lies in ensuring widespread adoption and effective integration with financial services to maximize the benefits of these data exchange initiatives. Ensuring data security, user trust, and seamless interoperability among different financial systems remains a critical focus to achieve the full potential of this PPP-driven model.

Brazil's strategy combines regulatory

13 Massally, K., Matthan, R., & Chaudhuri, R. (2023). What is the DPI Approach? Carnegie Endowment for International Peace. https://carnegieendowment.org/research/2023/05/what-is-the-dpi-approach?lang=en

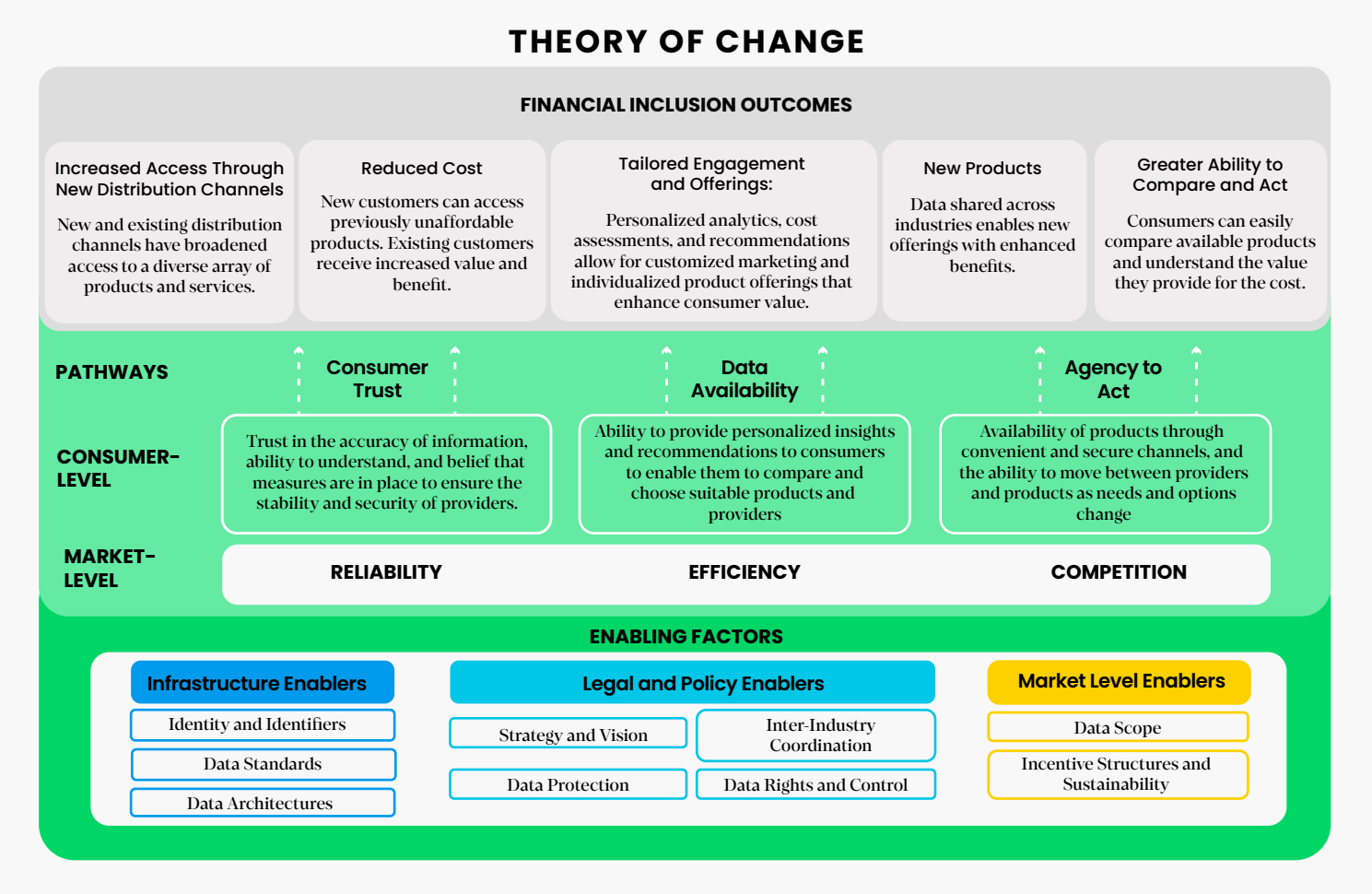
and participatory elements, involving stakeholders in the development of standardized APIs. This inclusive approach engages various financial institutions, fintech companies, and other stakeholders, although it presents challenges in ensuring data quality and completeness. The General Data Protection Law (LGPD) of 2020, aligned with the EU's GDPR, provides a robust framework for data protection and exchange, supporting Brazil's efforts to create a secure and inclusive data exchange environment. Brazil's approach to open banking is based on mandating the sharing of customer data among financial institutions with customer consent. This regulatory push aims to enhance competition, foster innovation, and improve financial inclusion by providing consumers with more choices and better services.

Each of these markets demonstrates a unique pathway to developing effective data exchange systems, reflecting their respective regulatory environments and technological infrastructures. By examining these varied approaches, this study highlights the diverse strategies that can be employed to enhance financial data exchange and the implications these have for other markets aiming to implement similar initiatives.

2.5 DATA EXCHANGE FOR FINANCIAL INCLUSION: A THEORY OF CHANGE

The benefits of data exchange for financial inclusion are significant and multifaceted. By enhancing the flow of information, data exchange can drive positive outcomes at both the market and consumer levels. To demonstrate the potential outcomes that can come from data exchange efforts, CFI created a theory of change to show the various factors and pathways that drive change. The theory of change has three core layers: the enabling factors, the impact pathways, and the resulting financial inclusion outcomes.

The theory of change hypothesizes that if data exchange is enabled, then reliable, efficient, and competitive market pathways will be strengthened, leading to improved consumer trust, data availability, and agency to act for the ultimate benefit of financial inclusion outcomes



1. **Enabling factors underpin the efficacy and potential of financial inclusion efforts.** Key enabling factors are categorized into three groups: infrastructure, legal and policy, and market level. Developments in any area can contribute to inclusive outcomes, but significant and sustainable impact depends on coordination between the three. Effective infrastructure requires consensus on standards and clear attribution of data provenance and subjects to ensure reliability and accountability. Efforts must be driven by clear and consistent objectives, and consideration should be given early on as to how data sources across industries (and geographies) can provide enhanced visibility of excluded groups and result in expanded and improved products and services. Underlying all these factors is the critical need for data protection — ensuring that as the financial inclusion ecosystem grows, it maintains the integrity and confidentiality of consumer data, as well as consumers' ability to manage and enforce data rights. At a market level, appropriate incentives for providers to drive participation and ensure

sustainability are key, as benefits compound with network effects in terms of the scope of data available, resulting in greater benefits for all stakeholders.

2. **Consumer and market pathways are essential for building trust and efficiency.** At the consumer level, trust is paramount. Trust is built on the accuracy of information, the ability for consumers to understand services, and the belief that robust security measures are in place. Data availability and the agency to act are central pathways that empower consumers. Market-level reliability, efficiency, and competition, on the other hand, drive the functionality and smooth operation of financial services. Data availability and the agency to act are central pathways that empower consumers. The ability to provide personalized insights and recommendations enhances consumer engagement, while the availability of products through secure channels and the agility to switch providers as needs change are critical for maintaining a dynamic market.

3. **Outcomes reflect the impact of financial inclusion on accessibility and choice.** The outcomes at the top of the financial inclusion framework illustrate the real-world outcomes of these efforts. Increased access through new distribution channels and reduced costs of services are direct benefits to consumers. Tailored engagement and offerings, arising from personalized data analysis, allow for customized solutions that prioritize consumers' benefit. The introduction of new products, through cross-industry data sharing and a greater ability for consumers to compare and act, not only fosters innovation but also reinforces the competitive environment, leading to a more vibrant and inclusive financial marketplace.

03 From Design to Implementation: Insights and Emerging Policy Approaches

This section focuses on the implementation approaches and barriers faced by policymakers in four leading markets. Despite growing policy research and industry insights, there is limited analysis on the practical challenges and policy responses in data exchange. While not exhaustive, this report attempts to provide a detailed analysis of key emerging debates in this rapidly evolving field.

Design features in open banking and their link to financial inclusion were analyzed in a seminal CGAP paper in 2020 , covering decisions about mandatory versus voluntary data sharing, standardization of APIs, and types of data included.[14] Revisiting this debate four years later, this study expands from open banking to the broader notion of data exchange. As markets move from design to implementation, they face new complex and nuanced policy choices critical for success and impact on inclusion. These policy choices are essential for the effective and sustainable operation of data exchange systems, addressing issues not fully resolved during the design phase.

The remainder of this chapter focuses on five key policy choices that emerged in the implementation phase in the four markets analyzed:

14 Plaitakis & Staschen (2020)

1. **Promoting the Participation of Incumbent Banks :** The four markets struggle to get large incumbent banks to fully participate in data exchange systems, despite holding crucial consumer data. While Brazil and India face issues like incomplete data and inconsistent participation, Singapore encourages API adoption through non-mandatory interventions, and the EU is exploring novel API compensation models to incentivize data sharing. These varied approaches highlight the ongoing challenge of making open finance both competitive and inclusive.

2. **Enabling a Vibrant Ecosystem of Third-Party Providers:** A key challenge in data exchange systems is the viability of third-party providers like data intermediaries and aggregators, which are essential for reducing friction in open finance. In India, the slow uptake of account aggregators and low revenue potential raise sustainability concerns, while in the EU, a decline in TPPs has prompted regulators to reconsider revenue models under frameworks like PSD3 and FIDA. Ensuring a vibrant TPP ecosystem is crucial, requiring regulatory support to balance market dynamics with sustainable business models, especially as markets mature and the role of intermediaries evolves.

3. **Promoting the Development of Cross-Sectoral and Interindustry Interoperability:** Open finance currently benefits primarily those who are financially included, as underserved segments lack the necessary data trails to participate. To broaden its reach, open finance must integrate with systems that capture data from sectors like agriculture and the digital economy. While non-financial data exchanges, such as Agri Stack in India, show promise for inclusive finance, the landscape is fragmented, with risks of siloed development. Achieving interoperability between sectors like agriculture and trade is essential for providing financial services with richer data and enhancing economic inclusion.

4. **Creating Convergence Between Open Finance and Legacy Data Exchange Frameworks:** As open finance grows, integrating it with traditional credit reporting is crucial but risks creating silos within the data ecosystem. While these systems are often seen as complementary, there's uncertainty and a lack of clear integration plans, varying across regions. Policymakers must ensure they work together to build a cohesive, inclusive financial ecosystem without undermining trust.

5. **Building Trust Through Increased Transparency and Clear Governance Mechanisms:** Success in data exchange hinges on building trust through transparency and clear governance. Transparency ensures all participants have access to critical performance data, as demonstrated by India's Sahamati and the U.K.'s Open Banking Implementation Entity (OBIE). Clear governance, with varied approaches across markets like India and Brazil, establishes the standards needed for confidence and collaboration among stakeholders.

3.1 ADDRESSING RESISTANCE FROM INCUMBENT BANKS

3.1.1 Challenges in Engaging Incumbent Banks

All four of the studied exemplar markets grapple with a similar problem: getting large, incumbent banks to fully participate in the data exchange systems. Incumbent banks hold vast amounts of consumer data, making their participation crucial. However, incentives for these banks to actively engage in data exchange initiatives are often lacking.

Brazil's annual Open Banking Report 2023 reports success rates over 90 percent with some variability of the course of the year, an improvement compared to the 80–85 percent reported the previous year.[15] However, our discussion with market participants highlighted that there are multiple challenges in addition to failed API transactions. Members of the Fintech Association reported that the official figures underreport the problem that their members experience — even though the transactions may not completely fail, the data received is often incomplete, difficult to interpret, or lacking the necessary structures. There is no data available on these partially failed or incomplete transactions, but discussions with various stakeholders agree that this is a problem that requires attention from regulators. At the 2024 Responsible Finance Forum, Nubank's head of public policy said that while open finance has enabled a wide variety of new functionalities and products, the problem of failed or partially failed transactions is a core risk that limits the potential for innovation and trust by customers.

India has faced similar problems. Despite the government initiatives to promote participation and Sahamati's role in establishing recommended technical and commercial standards for the ecosystem, lack of incentives for incumbent banks continues to be a challenge. According to stakeholders, several providers have established links with the account aggregator ecosystem but are not actively involved. For instance, it has been reported that some banks experienced error rates exceeding 99 percent in data retrieval processes.[16] Sahamati's dashboards focused on the "API health" show inconsistent participation. At the time of our analysis, almost half of the institutions had high failure rates.[17] Additionally, interviews revealed that the data obtained is sometimes incomplete or lacking the necessary structure, making further analysis challenging. Experts interviewed indicate that the challenges are both technical and related to the lack of sufficient incentives for banks, which significantly contributes to their limited engagement.

3.1.2 Policy Approaches to Incentivize Participation

Different approaches have been taken to address the lack of incentives for incumbent banks to facilitate data sharing. Many banks seem to view client data as an asset that, if shared, can erode their market power. Markets like Singapore have chosen to engage with banks through multiple

15 Open Finance Brazil. (2024). Annual Report 2023. https://ob-wp-media-files.s3.amazonaws.com/wp-content/uploads/2024/05/07141334/2023_OFB-Annual-Report.pdf

16 Singh, A. (2023, December 13). Tariff for NADL Account Aggregator Services. Mint. https://www.livemint.com/industry/banking/how-price-wars-hurt-account-aggregators-11702464234857.html

17 Note that the metrics are calculated weekly, and we collected our observations in January 2024. Metrics analyzed include API calls and linking confirmations among others. See more at: https://sahamati.org.in/saans-api-health-dashboard/

interventions to encourage API adoption, rather than impose an obligation upon them. Othe r markets such as Brazil have chosen to require selected banks to open APIs for consumers, but still struggle with enforcement mechanisms, especially if they do not have an operational role in API management through which to implement controls.

The EU is considering introducing the concept of "reasonable compensation" as a potential vehicle for incumbent financial institutions to monetize their involvement in open finance. This concept is outlined in the Financial Data Access (FIDA) framework, which seeks to enhance and expand upon the existing data sharing regulations set by the PSD2.[18] Unlike PSD2, which required banks to provide access to customer payment data to third-party providers for free, FIDA allows financial institutions to charge a reasonable fee for this access. This change aims to create a more balanced and sustainable business model by covering the costs that financial institutions incur in developing and maintaining the necessary APIs.

"Premium" APIs have become an increasingly common strategy for financial institutions to generate new revenue streams within the open banking framework. Premium APIs are advanced service interfaces that offer functionalities beyond the basic, mandated PSD2 requirements. These can include features such as enriched payment data, sophisticated data analytics, personalized financial products, and enhanced user experiences. Unlike standard APIs, which are provided free of charge to comply with regulatory requirements, premium APIs are monetized by banks, offering specialized services to third-party providers and businesses willing to pay for enhanced capabilities.

An evaluation of PSD2 conducted by the European Commission in 2023[19] acknowledges the increasing use of premium APIs and highlights the need for careful regulation. The evaluation emphasizes that while premium APIs can stimulate innovation and provide competitive advantages, they also pose risks of market imbalance if not properly managed. The review suggests implementing clear guidelines on the pricing and usage of these APIs to ensure they do not create barriers for smaller players or undermine the principles of open banking. Transparency and fairness in the deployment of premium APIs are also recommended to protect consumer interests and maintain a balanced competitive landscape.

Brazil's strategy for promoting participation in open banking prioritizes regulatory compliance over financial incentives to engage incumbent banks. While the EU is considering using reasonable compensation as an incentive to promote full participation from participating institutions, Brazil has been more cautious in taking this approach, arguing that it could develop an additional revenue stream towards large data holders (i.e., incumbent institutions), potentially affecting the objective of competition. In response to the challenges of participation from incumbent banks, the Banco Central do Brazil (BCB) has recently developed a

18 European Commission. (n.d.). Framework for financial data access. Retrieved January 2024, from https://finance.ec.europa.eu/digital-finance/framework-financial-data-access_en

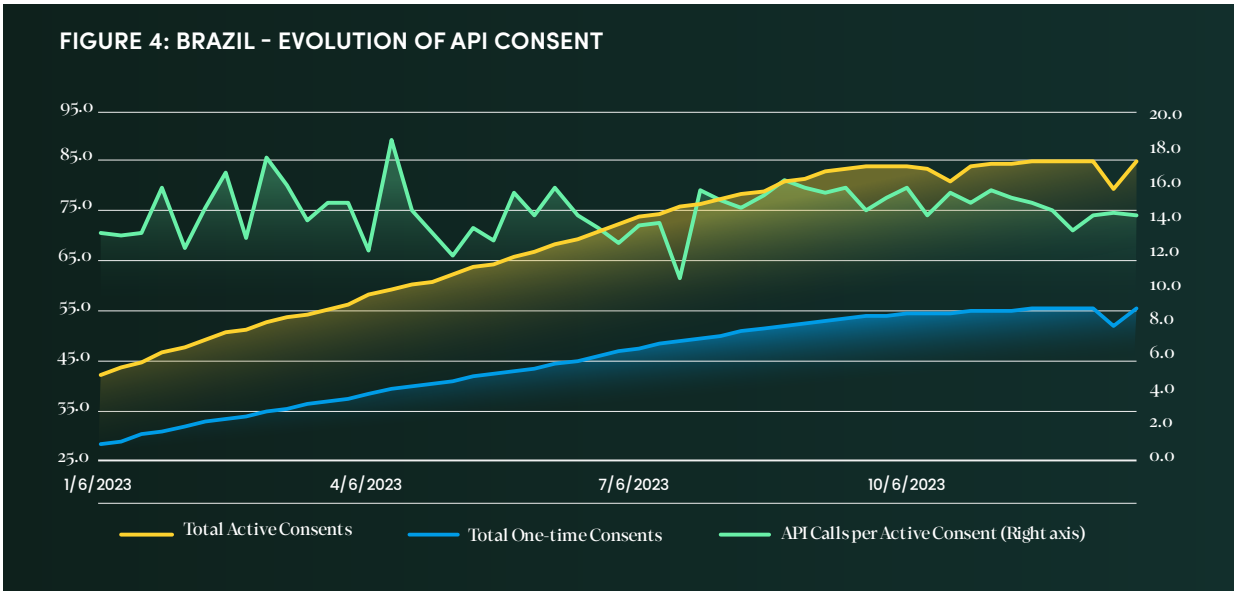
19 Bosch Chen, I., Fina, D., Hausemer, P., Henžel, A. et al. (2023). A study on the application and impact of Directive (EU) 2015/2366 on Payment Services (PSD2). European Commission: Directorate-General for Financial Stability, Financial Services and Capital Markets Union, Publications Office of the European Union. https://data.europa.eu/doi/10.2874/996945

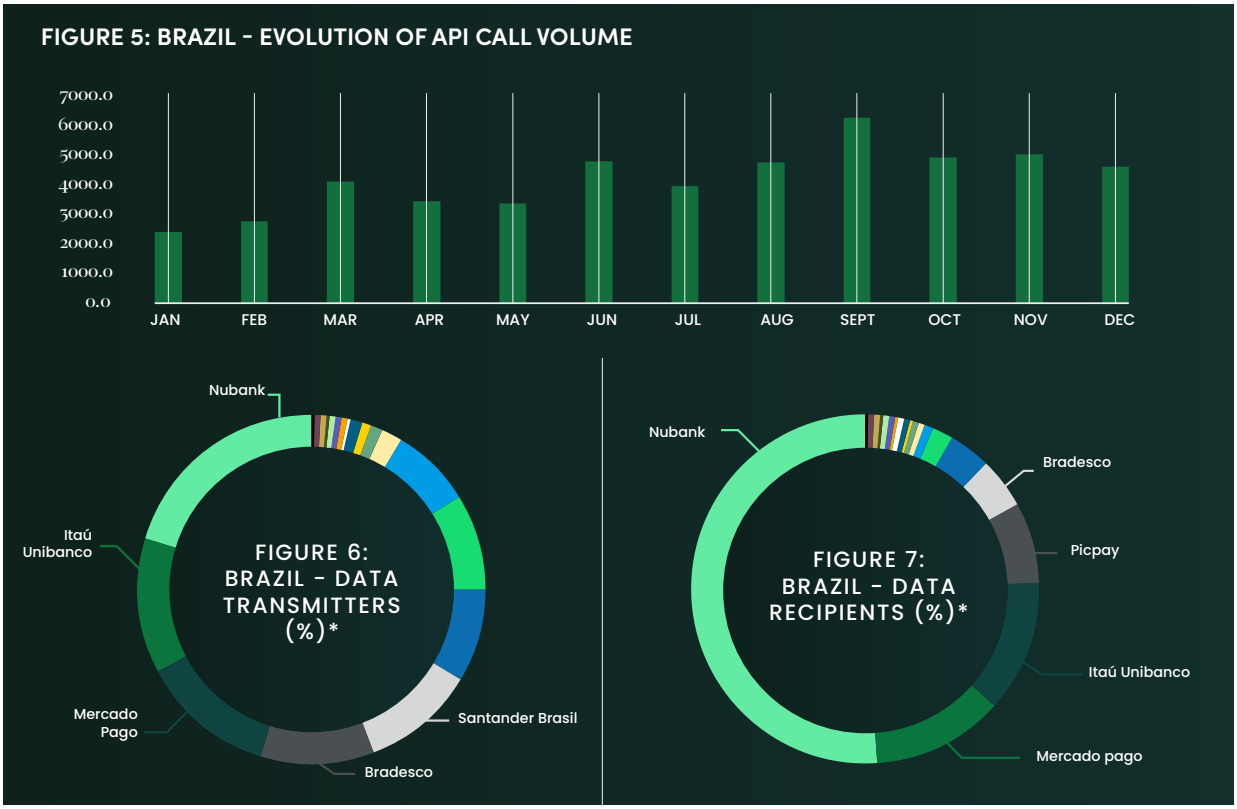
comprehensive sanction approach aimed at enhancing compliance. This regulatory mechanism introduces a phased process, beginning with institutions justifying their noncompliance, followed by submitting a rectification plan, and progressing through warnings to fines for persistent noncompliance. This approach is designed to incrementally encourage institutions to align with regulatory expectations, improving the ecosystem's efficiency and reliability. Furthermore, as the ecosystem evolves, there's ongoing discussion about revising the governance structure and exploring sustainable funding models, including the possibility of usage-based fees, to manage the operational costs associated with open finance participation more equitably across all institutions.

3.1.3 From "Old" to "New" Incumbents?

The question remains whether open finance is enabling a shift to more competitive markets or whether it is creating new types of incumbents in the data economy. Although open finance and open data ecosystems are still in their infancy, we see already some financial institutions better prepared to capitalize on the new opportunities, while others lag behind. In Brazil for example, data from BCB shows that Nubank is by far the most active player in open finance. As shown in the charts below, while the distribution of data transmitters is relatively balanced, Nubank receives over half of API data transfers enabled by open finance. Key use cases developed by Nubank are balance aggregation, which is used by about 20 percent of customers twice a month on average. Overdraft and "idle money" alerts are also growing in importance — Nubank alerts customers when they may avoid incurring fees or gain interest by moving money between accounts.

FIGURE 4: BRAZIL - EVOLUTION OF API CONSENT





Source: BCB, Dec. 2023

3.2 ENABLING A VIBRANT ECOSYSTEM OF THIRD-PARTY PROVIDERS (TPPs)

3.2.1 Challenges Facing Third-Party Providers

A second key barrier affecting data exchange systems concerns the role and viability of business models in the ecosystem of third-party providers (TPPs) such as data intermediaries, technical service providers, and account and data aggregators, among others. These service providers currently play a fundamental role in the data exchange ecosystems, as they help FSPs participate in open finance, reducing frictions linked to low capacity, evolving technical standards, and contractual obligations.

In India, the perception among many local market observers is that uptake of AA services has been slow and revenue potential from them is limited. While the framework is still evolving, some of the issues cited include the continued need for bilateral contracting between FIUs and FIPs, user experience issues including heterogeneous implementations and slow response times for "pulling" data from a financial information provider, and the low level of direct fee-based remuneration of aggregator services. Many of these issues are likely to be addressed over time, as market uptake increases and implementation issues are resolved.

3.2.2 Economic Viability and Revenue Models

Recent assessments point to increased competition and decreasing price levels among account aggregators . While specific figures are not provided via official channels, analysis from the Indian medi a shows that there are questions regarding the viability of business models.[20] The cost per consent for AAs in this landscape was initially in the range of $0.14 to $0.42 in 2021. However, competition has led to a significant reduction in prices, with costs currently as low as $0.07 to $0.14 and potentially even as low as $0.01 per pull for high volumes. For example, the price mentioned by NeSL Asset Data, an aggregator, is only $0.03 per pull.[21] Given the volumes achieved so far (see Figure 8), the sustainability of aggregators will be difficult to achieve in the near future unless AAs identify additional sources of income.

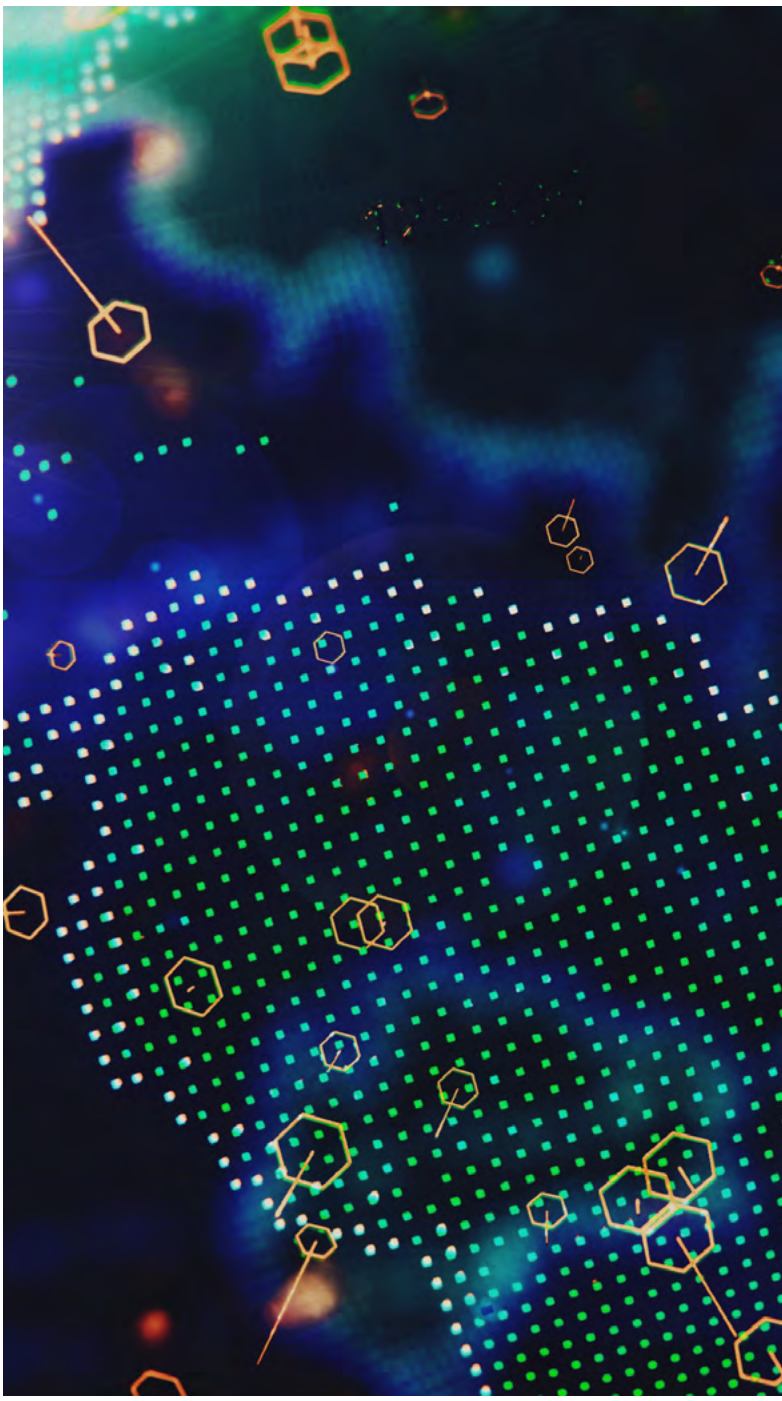


TABLE 2: ESTIMATED REVENUES IN AAS

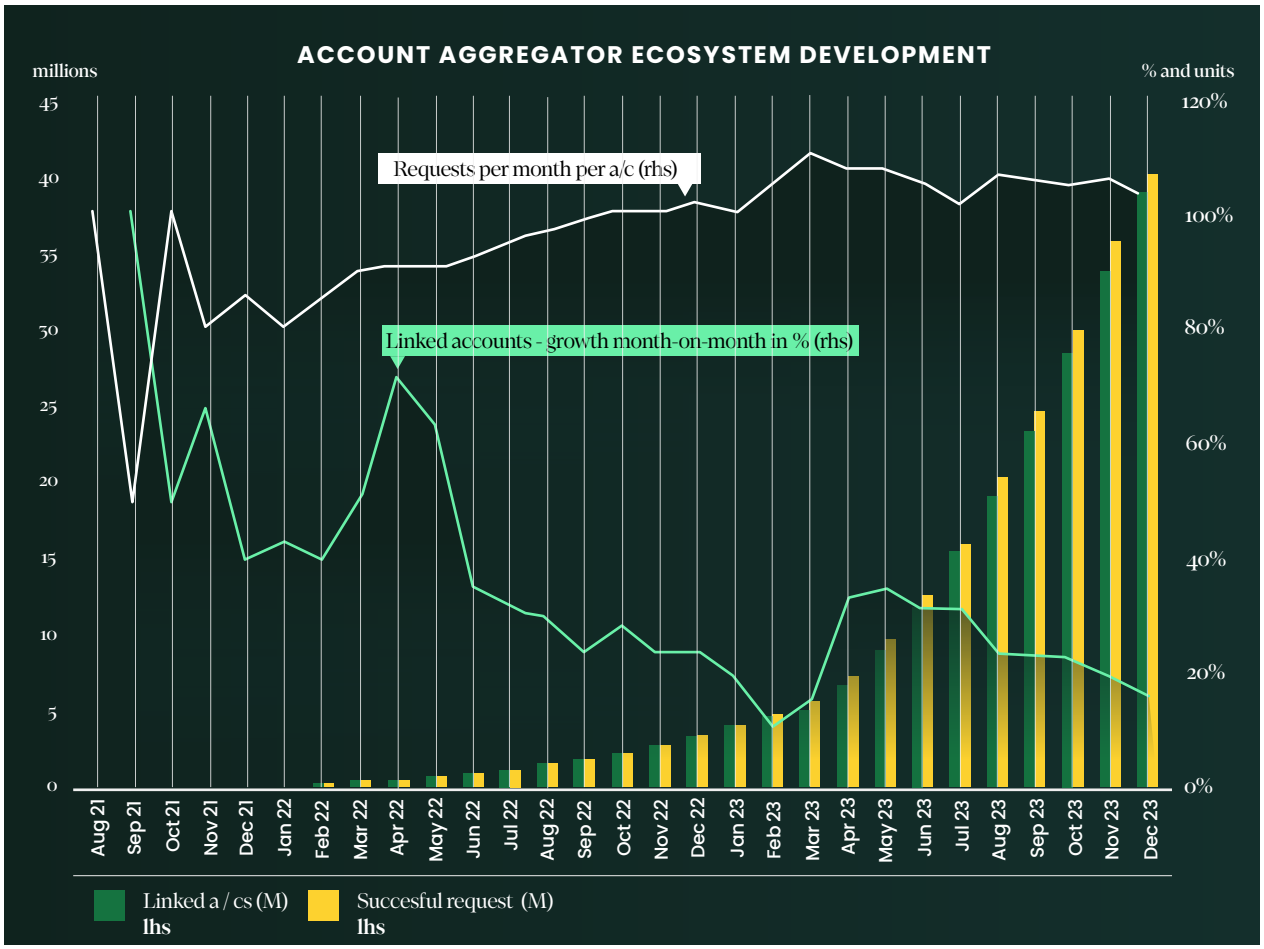
Charges for Data Pulls*	→ Approx. $0.06 (10 INR) to $0.12 (30 INR) in 2021 → Decreased to $0.36 (5 INR) on average in 2024, though variability depending on use case and volume
Volume of Data Pulls	→ Approx. 5 million in December 2023
Estimated Monthly Revenues	→ Approx. $300,000 to $600,000 total AA revenues in December 2023

Source: Singh (2023), Sahamati, Authors' computations

20 Pricing data of account aggregators is not publicly available, but estimates have been reported in various online media outlets. See for example: Singh (2023); Vir, A. (2023). The Account Aggregator Bible. Tigerfeathers. https://tigerfeathers.substack.com/p/the-account-aggregator-bible

21 NESL Asset Data Limited. (n.d.). Tariff for NADL Account Aggregator Services. Retrieved January 2024, from https://www.nadl.co.in/tariff

FIGURE 8: GROWTH IN THE ACCOUNT AGGREGATOR FRAMEWORK



Account aggregators are not the only type of third-party provider in the Indian open finance ecosystem. Technology service provider s are playing an increasingly important role and seem poised to have a growing impact within the ecosystem, offering essential services such as data encryption, decryption, and interpretation, for which they charge premiums ranging from $0.28 to $0.56 per analysis.[22] As the raw data transferred through account aggregators often requires several steps to clean, analyze, and interpret, technology service providers can play an important role in these early stages of market development in facilitating the exchange of data between the various ecosystem participants.

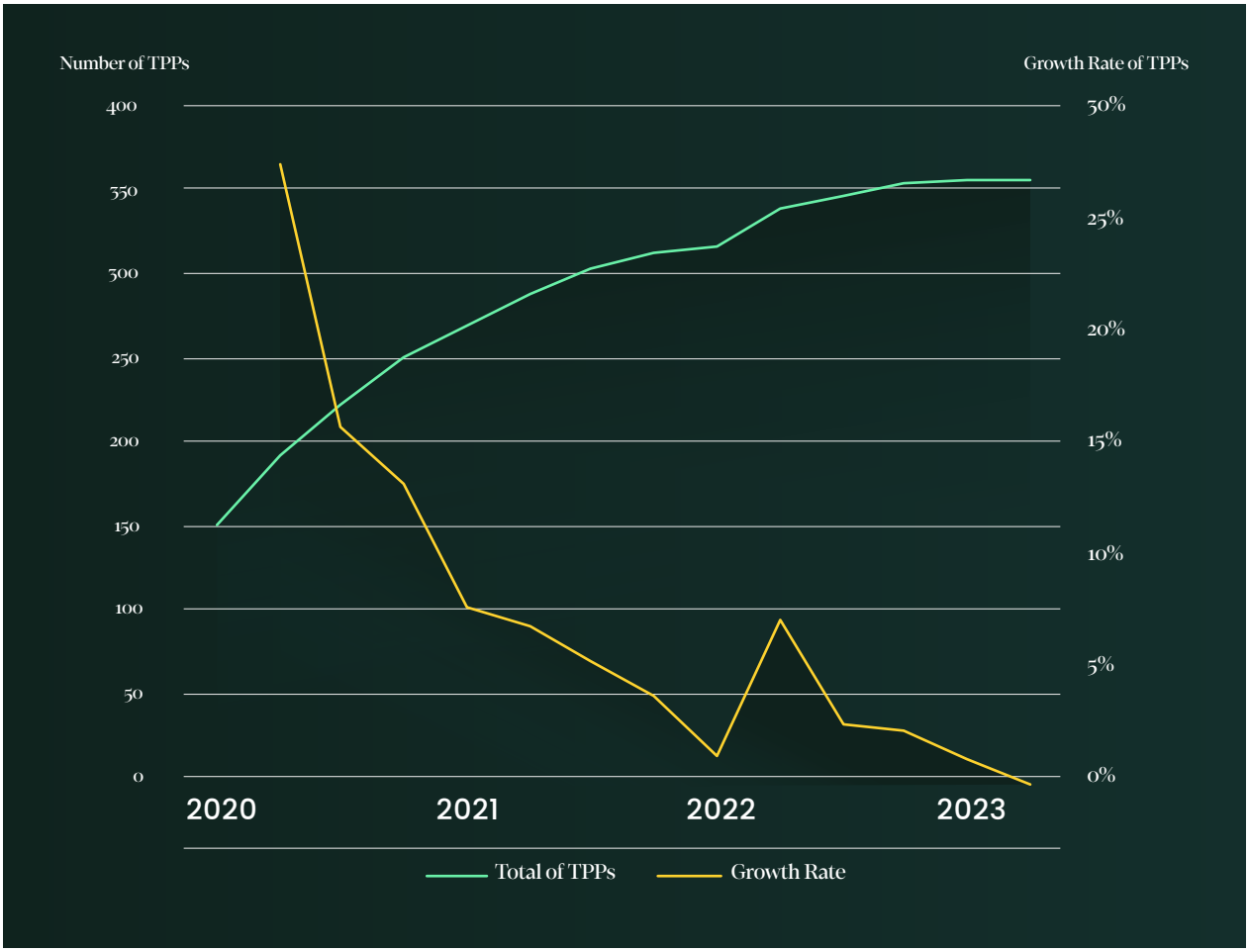
In the EU, an overall decline in the number of TPPs in open banking has raised concerns about their commercial potential. For the first time since the implementation of PSD2, the landscape of TPPs in the financial sector witnessed a slight decline at the end of 2023 (see Figure 9).[23] This decline can be attributed to various factors, including mergers and the intensified competition in the sector. Despite the dynamic nature of the market and the influx of venture capital investments in recent years, there are looming uncertainties surrounding the commercial viability of TPPs in the foreseeable future. A pertinent example is reflected in the performance of prominent market players within the EU and the U.K. Notably, companies such as TrueLayer

22 Singh (2023)

23 Konsentus. (2023, July 24). Q2 2023 Konsentus Third Party Provider Open Banking Tracker. https://www.konsentus.com/tpp-trackers/q2-2023/

and Yapili, which operate across multiple EU markets and the U.K., reported relatively modest revenues in 2022. TrueLayer's estimated revenue for the entire year stood at $5 million, while Yapili recorded approximately $4.1 million in revenue.[24]

FIGURE 9: NUMBER OF LICENSED TPPs IN THE EU



It is critical to enable adjacent services and economic viability for TPPs. Regulatory frameworks must balance market dynamics with viable revenue models for TPPs and consider the contribution of further downstream data aggregation analysis services. The success of data exchange initiatives often hinges on the competitive landscape and the dynamism among licensed TPPs. In the EU, a recent flattening in the growth curve of TPPs suggests a potential saturation in the sector, prompting regulators to reconsider revenue models in upcoming frameworks like PSD3 and FIDA. Unlike the current PSD2, which prohibits fees for data exchange, the new regulations may allow for such charges, indicating a recognition of the need for sustainable revenue streams to encourage active participation and innovation among TPPs. Table 3 outlines the key use cases developed by licensed TPPs in Europe.

24 Barraclough, G. (2023). Yapily results show slow pace of Open Banking growth. Business of Payments. https://businessofpayments.com/2023/10/03/3044/; Barraclough, G. (2023). TrueLayer claims open banking leadership in four markets but generated just £4m sales in 2022. Business of Payments. https://businessofpayments.com/2023/10/04/truelayer-claims-open-banking-leadership-in-four-markets-but-generated-just-4m-sales-in-2022

TABLE 3: USE CASES FOR PISPs AND AISPs, EUROPE

PARTICIPANT USE CASE	CUSTOMER SERVICES			
	PERSONAL CUSTOMERS		BUSINESS CUSTOMERS	
Account Information Sharing (e.g., balance, transaction history)	Account Aggregation	Enable customers to view finances across different institutions via single interface	Accounting Platform Integration	Enable businesses to integrate banking services with their accounting and enterprise resource planning systems
	Credit Decisioning	Enable customers to share financial data with third parties to inform/ enhance credit risk assessment, e.g., for loans	Cash Forecasting	Enable businesses to use third-party analytics for cash management optimization
Payment Initiation Service (e.g., bank transfer)	Wallet	Enable easier, programmed transfers to and balance management of e-wallets or mobile money accounts	Accounts Payable/ Receivable	Enable businesses to better manage cash management and reconciliation processes across different applications
	Credit Card Payments	Enable customers to program credit card balance check and repayments	Merchant Payments	Enable businesses to offer new payment mechanisms to customer, different rates, and loyalty services

In India, account aggregators operate within a framework that limits both use cases and revenue potential, primarily relying on income from API pulls. However, these revenues are modest and necessitate high volumes for sustainability. Despite growth in the sector, it has yet to reach the volume necessary to attract significant investment and innovation. Experts predict a consolidation trend, possibly reducing the aggregators to a third of their current number; this would be contingent on evolving regulations, particularly with the formalization of consent managers.

3.2.3 Future Role and Market Evolution

The role of intermediaries, however, is likely to decrease as the market matures, characterized by enhanced standards, increased capacity, and well-defined governance. Consideration should be given to the changing — and, in many ways, maturing — market context of data sharing and who it influences and how policymakers may need to intervene. For instance, intermediaries such as account aggregators, third parties, or account information service providers may have

an important role to play in helping banks (and other players) to implement common technical standards, processes, and practices at early stages. This is to create a new market standard or set of practices in an evolving market. Laws may be needed to force reticent actors to publish data. But these initial investments do not need to be constantly repeated. Once in place, maintaining standards should require less effort, and customer expectations may motivate banks or other data holders to maintain data sharing arrangements. Data access and portability may become a "hygiene factor" similar to other functions in banking, such as the provision of payment cards or mobile apps.

3.3 BUILDING INTER-SECTOR INTEROPERABILITY

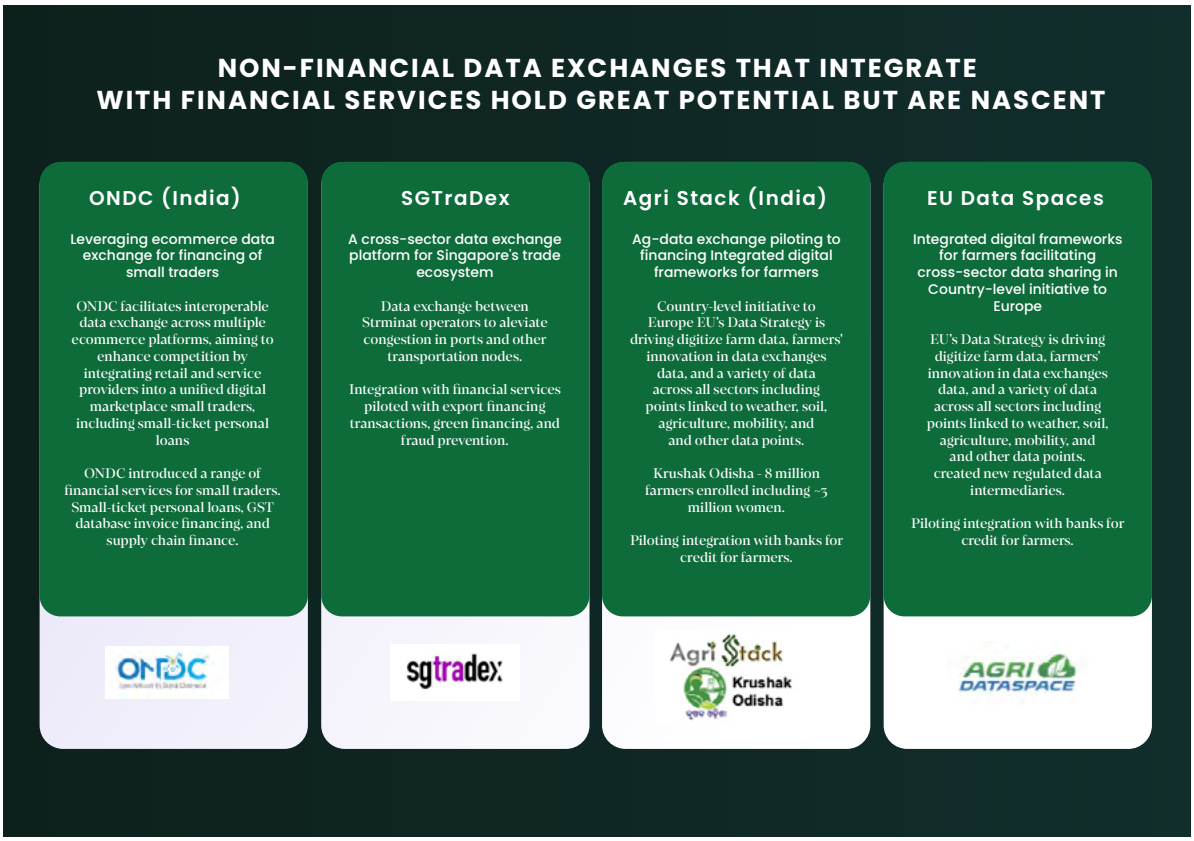
3.3.1 Barriers to Reaching Underserved Segments in Open Finance

At present, the potential of open finance is inherently restricted to those who are already financially included. Open finance's potential is limited because excluded or underserved segments lack the data trails necessary to participate in them. The lack of sufficient data trails for these segments makes data exchange ineffective for them, no matter how efficient the system is. To reach these segments, open finance needs to be integrated with data exchange systems that capture the economic activities of the poor, such as the agricultural sector or rapidly growing sectors of the digital economy that are achieving high levels of penetration in low-income communities.

3.3.2 Emerging Potential of Non-Financial Data Exchanges

The growing field of non-financial data exchanges, which involves the collection and use of non-financial data on individual consumers, accounts, and firms to improve financial service provision, exhibits considerable potential for inclusive finance. However, it remains in an emergent state, marked by ongoing development and exploration. The emergence of various models of data exchange in agriculture, ecommerce, and trade, as well as economy-wide initiatives, are providing valuable lessons on the challenges and potential for further integration with open banking and open finance initiatives (see Figure 10). In the agricultural sector, platforms such as Agri Stack in India and the AgriDataSpace in Europe, along with nascent approaches in Africa, are pioneering new approaches, while ecommerce and trade/logistics sectors are witnessing similar transformations through initiatives like ONDC and SGTraDex. These platforms are instrumental in providing deeper insights into sectors and consumers with poor data trails and who are traditionally underserved by the financial sector. Broader sector-wide data exchange policies, as seen in the EU's common data spaces, underscore a growing trend towards establishing more integrated data ecosystems. These policies and platforms collectively aim to foster a more interconnected and efficient exchange of data, which could significantly enhance economic inclusion.

FIGURE 10: NON-FINANCIAL DATA EXCHANGES THAT INTEGRATE WITH FINANCIAL SERVICES HOLD GREAT POTENTIAL BUT ARE NASCENT



Note: For a detailed analysis of ONDC, Agri Stack, SGTraDex and other data exchanges, see the market deep dives report available here.

In markets such as Brazil and India that have initially embraced open banking, there exists a broader vision of progressing towards open finance and ultimately an open data economy. While this vision holds significant promise, the current landscape reveals a more fragmented reality. Numerous initiatives are unfolding in parallel, each with its own set of objectives, standards, and ecosystems. This parallel development risks the creation of isolated siloes within industries, hindering the potential for seamless interindustry interoperability. However, it is crucial to emphasize that these interconnections are critical, especially in sectors like agriculture, trade, and transport that engage large segments of the population. Achieving interoperability between these sectors can yield mutual benefits — financial sector providers gain access to richer data sources for the development of innovative services, while the real economy gains improved access to working capital and asset ownership in vital segments of the economy.

3.4 INTEGRATING OPEN FINANCE AND CREDIT REPORTING AGENDAS

3.4.1 The Intersection of Open Finance and Credit Reporting

As open finance initiatives progress, understanding the convergence of open finance and traditional credit reporting regulations becomes increasingly important. The research shows that there is a risk of creating silos within the broader data exchange ecosystem, despite the potential for these two initiatives to be closely integrated.

Current studies on the impact of open finance on credit reporting frameworks are limited, but industry reports generally view the two systems as complementary and mutually reinforcing.[25] For instance, a report by Equifax estimates a 500 percent increase in open banking API calls between 2020 and 2023 in the U.K. market, indicating significant growth and potential for innovation in credit risk assessment.[26] Credit reporting is typically governed by well-established regulations specific to credit information sharing, while open banking operates under a different set of regulations that focus more on data sharing and privacy. While coordination between the two areas is not currently considered a material barrier, it is important to note that some stakeholders highlighted that both open finance and credit reporting should be considered components of a broader strategy for data exchange in the financial sector, and coordination will be increasingly important to avoid regulatory fragmentation, uncertainty, and uneven playing fields. Policymakers have yet to develop explicit roadmaps on how open finance and credit reporting frameworks will integrate, even as plans for expanding open finance into areas like insurance and pensions are discussed. This lack of coordination in regulatory approaches and oversight can lead to fragmentation, where data usage and protection rules are inconsistently applied, adding complexity and uncertainty to the integration of these systems.

3.4.2 Regional Variations and Emerging Challenges

The situation varies significantly across different regions. In the EU, several credit bureaus have obtained AISP licenses under the open banking regime, allowing them to offer integrated services that combine credit reporting with open banking data. For example, CRIF became the first credit bureau registered as an AISP in 21 European countries in 2018, enabling the exchange of retail credit payment data among various entities.[27] Experian Ireland Limited was granted an AISP registration by the Central Bank of Ireland in 2022, allowing it to provide regulated open banking services across EU/EEA markets. In contrast, Brazil has no licensing regime for account aggregators in the open finance space due to the structure of its data protection laws, though payment initiation providers are licensed by the Central Bank. In India, the account aggregator space is diverse, with licenses granted to both subsidiaries of credit bureaus like CRIF Connect and

25 For a discussion on the potential of open finance to substitute credit bureaus, see: Rishabh, K. (2024, April 16). Beyond the Bureau: Interoperable Payment Data for Loan Screening and Monitoring. https://ssrn.com/abstract=4782597

26 Equifax. (2025). How Open Banking is transforming lending and credit risk. https://assets.equifax.com/assets/unitedkingdom/open_banking_expo_how_open_banking_is_transforming_lending_and_credit_risk-white_papers.pdf

27 CRIF. (2018, November 29). CRIF becomes the first Open Banking AISP to be registered in 21 European countries through the acquisition of Credit Data Research Realtime Holding Ltd. [Press release].

large platforms such as PhonePe, reflecting varying dynamics within the data exchange landscape. Given the unique characteristics of each market, it is unclear how established credit reporting firms will navigate this uncertainty. Interviews with credit bureaus suggest a risk of lack of coordination, with some expressing concerns that the unique value proposition of credit bureaus compared to open banking operators — particularly their data on negative credit histories — could risk reverting to outdated perceptions of credit information systems as mere "blacklists" for defaulters, although many countries have integrated positive credit information and alternative data sources like utility payments, as seen with Brazil's "Cadastro Positivo."[28]

3.5 BUILDING TRUST THROUGH TRANSPARENCY AND CLEAR GOVERNANCE

3.5.1 The Importance of Transparency in Data Exchange

Success in any data exchange arrangement ultimately hinges on trust, not only from consumers who must consent to move their data across institutions but also from the ecosystem of financial service providers, fintechs, account aggregators, and third-party participants who make the ecosystem vibrant and innovative. The four markets analyzed — Brazil, Singapore, India, and the EU — highlight two main dimensions essential to achieving this trust: transparency and clear governance.

Transparency about the volumes of API calls, the participation of different types of institutions, and the failure rates and overall health of the system have proven to be very valuable. A key example of this is Sahamati in India, which regularly produces in-depth reports and constantly updated dashboards with diverse metrics about the use of account aggregators.[29] In contrast, the U.K.'s Open Banking Implementation Entity (OBIE) has established a comprehensive data collection framework that includes setting target outcomes, determining the scope and frequency of data collection, and defining the data sets to be collected. OBIE publishes updated API performance data on its website, ensuring stakeholders have access to current information.[30] In Brazil, where data exchange occurs either bilaterally between institutions or with the support of third-party providers, the Central Bank has established reporting frameworks. However, measuring performance remains challenging, particularly regarding data quality and structure issues. Despite these challenges, efforts to create transparency through live dashboards and regular market reports[31] have been appreciated by many participants. Identifying good practices in defining open finance metrics and encouraging governments globally to track comparable metrics is crucial.

https://www.crif.com/knowledge-events/press/crif-becomes-the-first-open-banking-aisp-to-be-registered-in-21-european-countries-through-the-acquisition-of-credit-data-research-realtime-holding-ltd

28 Banco Central do Brasil. (2019, August 5). The revitalized Positive Credit Report has become fully operational. https://www.bcb.gov.br/en/pressdetail/2279/nota

29 Sahamati. (n.d.). Ecosystem Dashboard. Retrieved January 2024, from https://sahamati.org.in/aa-dashboard/

30 Open Banking. (n.d.). API Performance Stats. Retrieved January 2024, from https://www.openbanking.org.uk/api-performance/

31 Open Finance Brasil. (n.d.). Dashboard: API Calls. Retrieved January 2024, from https://dashboard.openfinancebrasil.org.br/open-data/api-requests/evolution

3.5.2 Establishing Clear Governance for Trust

A second key dimension in building trust is through the establishment of clear governance mechanisms. The markets analyzed have taken very different approaches. In India, the primary governance mechanism in the account aggregator system is Sahamati, an industry association on a path to being recognized as a self-regulatory organization. Sahamati helps the industry grow through increased awareness and transparency and supports contracting standards to ensure that participating institutions are aware of best practices and responsibilities. In the EU, while the European Banking Authority maintains registers of licensed AISPs and PISPs,[32] there is no centralized data tracking use and adoption of open banking, making it difficult to monitor progress and build trust. The Berlin Group, an industry initiative, has been established to foster harmonization and common standards.[33] Brazil has taken a unique approach to open finance governance, characterized by highly participatory processes and some challenges in implementation and execution. The governance structure of Brazil's open banking system is privately funded by participating institutions, designed to ensure representativeness and plurality. Managed by a deliberative council and various technical groups, this structure approves technical standards. The Central Bank retains a veto right and actively participates in all decision-making processes to maintain regulatory alignment. Initially, the expectation of self-regulation among institutions faced challenges, prompting the Central Bank to intervene directly to establish technical standards. A metrics platform and user experience monitoring are being developed to assess and enhance the performance of participating institutions.

While emerging best practices around transparency and governance are not definitive and require further research, the experience from leading markets shows that achieving success in data exchange arrangements requires a robust foundation of trust built through transparency and clear governance. Transparency ensures that all participants, from consumers to financial institutions, have access to critical information about system performance and data handling practices. This openness fosters confidence and encourages participation. Clear governance structures provide the necessary framework to ensure that all stakeholders operate under agreed-upon standards and regulations, mitigating risks and enhancing collaboration.

32 European Banking Authority. (n.d.). Register of payment and electronic money institutions under PSD2. Retrieved January 2024, from https://www.eba.europa.eu/risk-and-data-analysis/data/registers/payment-institutions-register

33 The Berlin Group. (n.d.). About. Retrieved January 2024, from https://www.berlin-group.org/

04 Conclusions and Recommendations

This study aimed to explore the evolving landscape of data exchange, focusing on the key policy choices that leading markets like the EU, Singapore, India, and Brazil have faced in their i mplementation stages. These choices offer critical insights for countries beginning their journey on data exchange that can learn from global experiences. The research identified five main policy choices that these markets are grappling with, each presenting unique challenges and opportunities for developing robust data exchange ecosystems.

These implementation phase policy choices involve complex decisions that extend beyond the initial foundational steps but are closely related. Key areas include promoting participation among incumbent banks, fostering a vibrant ecosystem of third-party providers, and ensuring interoperability between different digital infrastructure layers. Additionally, maintaining transparency and robust data protection measures, adopting innovative models to extend services to underserved populations, and ensuring seamless integration between financial and non-financial data exchange systems are crucial.

By examining the approaches and challenges faced by these leading markets, this study provides insights for other countries developing their own data exchange frameworks, emphasizing key policy choices needed to create inclusive, secure, and efficient data ecosystems.

1. Addressing Resistance From Incumbent Banks

To effectively address resistance from incumbent banks, regulators and policymakers should adopt a balanced strategy that leverages both incentives and enforcement measures. On the incentive side, creating targeted rewards that align with banks' business goals can motivate their participation in data exchange initiatives. These incentives should be designed to make data sharing attractive without undermining their competitive edge. On the enforcement side, penalties should be applied through a phased approach, such as Brazil's model, which starts with requiring explanations for noncompliance and escalates to fines for continued resistance. Additionally, exploring compensation models in data exchange as a financial incentive can serve as a further reward, provided it fosters competition and innovation without disproportionately benefiting larger institutions. While these policy choices are promising, more research is needed to fully understand their effectiveness and long-term impact, as these approaches are relatively new and their outcomes will become clearer over time.

2. Enable a Vibrant Ecosystem of Third-Party Providers

To strengthen the ecosystem of third-party providers, it is essential to enable sustainable business models through regulatory adjustments that allow for service fees and support the development of new revenue streams. This should be done by carefully calibrating barriers to ensure both competition and robust safeguards around technical standards and data protection. While third-party providers play a critical role in facilitating data exchange at the current stage, it is uncertain whether this role will continue at the same level in the future. As data exchange standards become clearer and simpler, and as financial institutions build their capacity to operate directly in these markets, the role of third-party providers may diminish or evolve into new functions. This potential shift is an important area for policy research, as it will significantly influence the direction of work by policymakers, financial inclusion programs, and donors in this space.

3. Build Inter-Sector Interoperability

Policymakers, regulators, and financial inclusion programs have two main functions to pursue in building inter-sector interoperability. First, they need to set a long-term vision and strategy for the interoperability of data exchanges across sectors. This vision is crucial because it positions data exchange as a series of interconnected building blocks rather than isolated initiatives managed by different regulators.

In addition to setting a vision, it is vital to pilot use cases in the short term. For example, the agricultural data exchange initiative in Odisha, India, piloted a program for exchanging data with local banks to facilitate financing. While these integrations are challenging, they provide valuable insights into the practical implementation

hurdles and the potential benefits of such cross-sector data exchanges. Alongside these efforts, research is needed to identify the potential and key obstacles in implementing these "bridges" across different data sectors. This research will help uncover the critical factors that can either facilitate or hinder successful data exchange, guiding future policy decisions and program designs.

4. Avoid Silos: Integrate Open Finance and Credit Reporting

To avoid creating data silos, it is essential to develop clear roadmaps that define how open finance and credit reporting frameworks will integrate. These roadmaps should ensure that the systems function cohesively rather than in isolation. By emphasizing their complementary roles, policymakers can improve both credit risk assessment and financial inclusion. Treating these frameworks as interconnected within a broader financial ecosystem allows stakeholders to fully leverage data sharing while minimizing fragmentation.

5. Build Trust Through Transparency and Clear Governance

To foster trust among all participants, it is essential to mandate and standardize regular reporting on key indicators such as API performance, data exchange volumes, and system health. This transparency can help ensure that all stakeholders have access to reliable information. Clear governance structures with well-defined roles, responsibilities, and enforcement mechanisms are also critical to ensuring compliance with established standards. Policymakers should monitor and learn from the experiences of leading markets like India, the EU, and Brazil to identify and adopt best practices in transparency and governance.

Furthermore, more research is needed to standardize open finance indicators across markets, which will enhance comparability and make it easier to track the impact of these initiatives. This research will help establish a consistent framework for assessing the effectiveness of open finance systems globally, ensuring that data exchange efforts are both transparent and impactful.

CENTER *for* FINANCIAL INCLUSION | ACCION

The Center for Financial Inclusion (CFI) works to advance inclusive financial services for the billions of people who currently lack the financial tools needed to improve their lives and prosper. We leverage partnerships to conduct rigorous research and test promising solutions, and then advocate for evidence- based change. CFI was founded by Accion in 2008 to serve as an independent think tank on inclusive finance.

www.centerforfinancialinclusion.org

Center for Financial Inclusion (CFI)