
CONTEMPORARY DATA SHARING MODELS: OPEN BANKING AND OPEN FINANCE

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Contemporary data sharing models: open banking and open finance

Ivan Radanović

Abstract: The goal of this paper is to analyse the concepts of open banking and open finance as data sharing models in banking and financial industry. A key idea behind these concepts is to enhance competition among payment service providers, ensure greater transparency of their work, expand the range of choices for consumers and, most of all, add value for the final consumer by improving the quality and reducing the price of services. In Europe, service providers from several European Union countries (Germany, the Netherlands, and Sweden – Sofortüberweisung, iDeal and Trustly) became the key drivers of data sharing models, prompting the European Union to regulate this new type of payment services in order to improve competition in the payment services market and ensure better consumer protection. The Payment Services Directive 2 (PSD2) 2015/2366 was thus adopted, requiring banks to allow access to customer information to all third-party providers such as payment institutions, e-money institutions, FinTech companies and other credit institutions, subject to customer's consent. PSD2 recognises two new types of non-banking market participants – account information service providers (AISP) and payment initiation service providers (PISP). The paper combines the descriptive and comparative methods, as well as the case-study method, to give an outline of important data sharing regulations and models, and of the abovementioned payment service providers. The paper also looks into the experience of applying open banking and open finances in the United Kingdom and Brazil. The final section of the paper deals with institutional assumptions for developing the data sharing model in the Republic of Serbia. The current Law on Payment Services (RS Official Gazette, Nos 139/2014 and 44/2018) is largely harmonised with PSD2, as the original Payment Services Directive 2007/64 was fully transposed into the national legislation. Full harmonisation with PSD2 has been achieved through amendments to the Law on Payment Services (RS Official Gazette, No 64/2024) of 31 July 2024, which lay down measures to further enhance competition, innovation and the range of choices for the end-consumer. This Law will be applied as of 6 May 2025. Among other things, open banking will be introduced, as will the domestic equivalents to AISP and PISP participants.

Keywords: data, open banking, open finance, payment initiation, account information, Law on Payment Services

[JEL Code]: E42, G15, G21, G28

Non-technical summary

Over the past years, banking and financial markets have increasingly relied on an expanding volume of data generated by the global economy and private individuals, mostly by using products and services on the internet. The result is a wide range of modern services which are becoming available to an ever-greater number of users – e- and m-banking, digital or cryptocurrencies, and numerous other financial technologies. Internet and smartphone use has reshaped the way banks and financial institutions organise their business, broadening access to financial services and increasing the transparency of work of payment service providers. Open banking and open finance are among the key financial technologies today.

The goal of this paper is to give an outline of these concepts, starting from their basic features to the benefits and challenges of their application. Introduced by the Payment Services Directive 2 (PSD2), they are the next step in demonopolising data and decentralising the provision of payment services, the hub of which has traditionally been in credit institutions, i.e. banks. By definition, this should mean increased market competition, enhanced transparency of work of payment service providers, wider range of choices for consumers and overall added value growth for end-consumers. The extent to which these intentions are realised depends on the market and characteristics of regulation.

Independent from regulatory details, open banking and open finance models imply two key market participants – account information service providers and payment initiation service providers. By contrast to open banking, which includes payment services and account information services, open finance is broader in scope and includes other financial services such as investment, insurance, etc. By combining the descriptive-comparative method and the case-study method, the paper analyses the features of open banking and open finance, their differences and the experience of their application in advanced markets such as the UK and Brazil. Experiences in these two markets so far indicate that the key factors behind the success of open banking and open finance are digitalisation and the private individuals participating in it, which refers mostly to the understanding and awareness of these concepts. This holds true both for private individuals and for payment service providers which view these models differently and have a different perception of the costs and benefits of their application.

The final section of the paper focuses on institutional assumptions for the introduction of these models, primarily of open banking, in our country. Though at this point domestic legislation, primarily the Law on Payment Services from 2014, is largely harmonised with important European Union regulations in this area, full harmonisation has been achieved with the adoption of the new Law on Payment Services which will, among other things, create the preconditions for introducing open banking and for the start of operation of account information services providers and payment initiation service providers as independent non-banking participants in the payment services market.

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1 Introduction

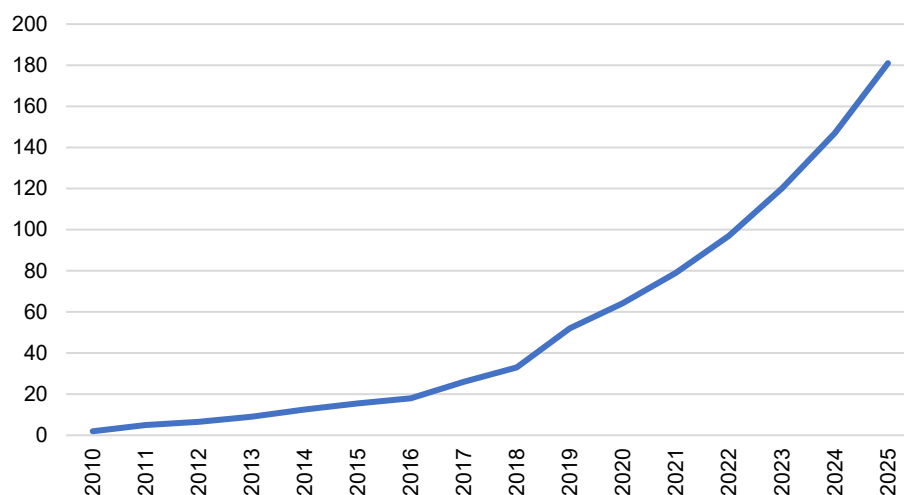
The history of economic development is the history of multiplying information. From the simplest forms of exchange, through the first outlines of a market organisation, to complex financial markets, development is accompanied by exponential growth in the volume and complexity of information. This has shaped decision-making in the market, by companies and private individuals. As the organisation of human societies became more complex, information collection, processing and dissemination techniques were developed, leading to the knowledge-based economies, post-industrial or information societies of today.

The information society is characterised by the integration of information technology as a key factor in all kinds of production (Eriksen, 2001). Information technologies, particularly the internet, are increasingly becoming vital. Over the past decades, the internet has fundamentally transformed market operations and led to greater interconnectedness and speed of exchange of information locally, regionally and globally. The number of internet users rose in the 2005–2023 period from one billion to 5.4 billion people – from 16% to 67% of the global population – with almost 40% of the world’s population now covered by 5G (ITU, 2023). In the services sector, such dynamics boosted the significance of online education, remote work and other ways of earning money remotely. In the industry, the internet enabled automation through AI, integration of robotics and other ways to enhance productivity.

In the financial sector, another harbinger of change is the increased use of contemporary non-cash payment instruments, such as e- and m-banking, digital and cryptocurrencies, and different financial technologies which have broadened access to financial services. Internet and smartphone use has reshaped the way banks and financial institutions organise their business. Already today, a fifth of all commerce takes place online, with e-commerce expected to expand from USD 5.8 trillion to USD 7.9 trillion in the 2023–2027 period (Forbes Advisor, 2024). The global FinTech market was valued at USD 295 bn in 2023 and is projected to be worth as much as USD 1.2 trillion by 2032 (Fortune, 2024), posing a growing threat to the traditional banking market.

The digital transformation of financial services has expanded the business ecosystems, changing the traditional roles in the market and giving rise to new ones. The driving force of change is immense: around 329 billion gigabytes of data are generated daily in the global network, and the total quantity is rising exponentially. Over the last two years alone 90% of the data in the world was generated (Bernard Marr, 2024).

Chart 1 Global amount of data created since 2010, with forecasts to 2025
(in billion gigabytes)



Source: Statista, 2024.

The above amount of data is created through internet searches, exchange of e-mails, use of social networks, online stores or multimedia content, as well as the internet of things products and services and similar. The bulk of these data are stored with data custodians.

As the historical boundaries between sectors and services are getting blurred, new trends are emerging, such as platformisation, where financial service consumers request an increasing variety of services from a limited number of market players.

Data sharing has turned out to be an increasingly important factor of innovation and greater economic efficiency in many activities. The dual nature of data is thus recognised (Krivokapić et al., 2019). The collected and generated data are analysed, aggregated and matched in search of patterns and new insights supporting initiatives and business ideas. Therefore, the collected and generated data can most of all be seen as a tool for making more informed decisions in our work. The second role of data is that of a resource created as we use different digital solutions in our everyday work, i.e. the digital data footprint. Hence data sharing has both a cooperative and a competitive dimension, as data commercialisation is an important factor of competitive advantage.

With the multiplication of information and the integration of business systems, companies have become increasingly aware of the significance of data sharing based on which it is possible to optimise business processes and create new value in the market. This also refers to e-commerce platforms which can use consumer behaviour data to create personalised content, and for research purposes.

In addition to creating benefits, data sharing mechanisms also carry different ethical and security risks or risks relating to consumer privacy. For this reason, one of the greatest business challenges is to strike the subtle balance between benefiting from the power of using a large quantity of data and preserving the integrity and privacy of consumers. The users of internet and internet-based devices for the most part have no access to their digital data footprint. It has therefore become necessary to regulate this area so as to give consumers more control over how data on their behaviour are used and who they can be shared with.

When it comes to financial services, the changeability of preferences of payment and other financial services consumers has prompted governments, central banks and international organisations to upgrade the legislation relating to such services. For this reason, below we present an overview of regulation of the payment products and services market and banking operations in Europe in order to trace the development of the above trends.

2 Data sharing – a regulatory retrospective

A single market for financial services has been under construction in the European Union since 1973 (Kokkola, 2010). Initially, the focus was on the provision of a secure prudential environment for the cross-border activities of banks. Financial markets were still divided along national lines. Integrative processes accelerated after the changeover to the euro in 1999 and the creation of the euro area. The single money market was the first important step in integrating the market of financial services, i.e. the market for the provision of payment and securities services, while ensuring fair competition and appropriate consumer protection.

To achieve this, it was not enough to remove only technical barriers (to upgrade infrastructure), but legal ones as well. Only a modern and efficient legal and regulatory framework is capable of guaranteeing the safety and efficiency of payments and securities transactions. This also entailed the exchange of payments data among payment service providers, and there was a rising awareness of the importance of this exchange. Since the 1980s, the European Commission issued a number of recommendations relating to payment systems, including Commission Recommendation 87/598/EEC on a European Code of Conduct relating to electronic payment, Commission Recommendation 88/590/EEC concerning payment systems, and in particular the relationship between cardholder and card issuer, and Commission Recommendation 97/489/EC concerning transactions by electronic payment instruments and in particular the relationship between issuer and holder. These were non-binding documents.

In late 1990s, as the market became more complex, the internet and internet-based technologies developed and the EU was enlarged, binding legal documents as we know them today were adopted – regulations and directives. The main difference between the two is that regulations are applied directly, in all members states, without intervention by national parliaments, while directives indicate a target to be achieved, and it is up to the national governments to achieve it in the most appropriate manner. Already in 1997, the first Directive 97/5/EC on cross-border payments was adopted, followed by Directive 98/26/EC on settlement finality in payment and securities settlement systems.

Despite the regulatory dynamism of the European Union,¹ at the start of the century it was still difficult to say who was allowed to provide payment services. An entity wishing to provide these services faced widely differing national regulations, with one member state requiring

¹ In March 2000, the importance of responding to the shift to a 'digital, knowledge-based economy, prompted by new goods and services' was recognised. This involved the creation of a more favourable environment for the expansion of e-commerce and for the wider use of the internet and information technologies. In order to help achieve those objectives, a comprehensive 'eEurope Action Plan' was drafted in 2002, and upgraded in 2005 (Athanasios & Mas-Guix, 2008).

customer authorisation and the other not. In some member states, payment services could only be provided by credit institutions (e.g. banks), while in others a special e-money licence or another type of licence was required. In the conditions of dynamic economic growth – which also entails rising demand for cashless payments and increasing diversity of financial services – such heterogeneity required regulation.

2.1 Payment Services Directive – PSD

In 2007, the European Commission adopted the Payment Services Directive 2007/64/EC (PSD), repealing Directive 97/5/EC. The main aim of the Directive was to create a single and homogenous payments market within the European Union, and:

- i)* ensure that cross-border payments are carried out as easily, efficiently and securely as domestic payments within various member states;
- ii)* encourage competition in the payment services market, upgrade consumer protection and enhance the transparency of payment service providers.

The second task was to try to eliminate the exclusivity of banks in payment services provision. For this reason, one of the most obvious consequences of introducing PSD was the definition and regulation of the category of payment institutions and improved regulation of electronic money institutions.²

The Directive was largely successful, because it facilitated market entry for new payment service providers, and increased competition and choice for consumers. It established clarity with regard to the rights and obligations of payment service providers and users, reduced transaction costs and time, reinforced users' right to refund, and ensured that pan-European payments are completed a maximum of one day after the payment order is given. Thanks to the harmonisation of national rules on cashless payments and the resulting economies of scale, PSD established a framework for creating the Single Euro Payment Area (SEPA), its further constitution³ and successful implementation of its rules (European Commission, 2018).

Though it resulted in improvements, PSD had its downsides too. The unclear language and abstract principles led to different approaches of national regulators (Kroes, 2010). This made communication and cooperation between governments difficult, as well as intensifying other problems relating to its implementation, consumer protection and the scope of regulation.

Namely, some authors believe that the Directive has unintendedly strengthened the power of already established actors on the market and therefore made it difficult for new actors to find a way in (Janczuk-Gorywoda, 2015). Namely, companies that wanted to provide a service not regulated or insufficiently regulated by the Directive were often forced to have a contract with a bank to be able to provide this service. On the other hand, when it comes to payment

² E-money institutions were first included in the existing definition of credit institutions under Directive 2000/28/EC and then regulated as a special type of institution under Directive 2000/46/EC.

³ The fundamental and comprehensive SEPA regulation was Regulation 2012/260 establishing technical and business requirements for credit transfers and direct debits in euro and amending Regulation 2009/924 on cross-border payments in the European Community.

services provision, banks were disproportionately affected relative to other payment institutions as they are subject to stricter regulation and supervision. Although this is explained by the fact that payment institutions provide only payment and not other banking services, it still means an additional cost burden for a bank's financial services.

According to some authors, insufficient regulation of payment institutions also became visible through risks for consumer protection. Namely, while credit institutions were still obligated to have sufficient own funds to cover operating and liquidity risks, there was no such protection scheme for payment institutions. And whereas this made sense from the viewpoint of supporting new market players, it also meant a risk that payment institutions' clients would lose their money if these institutions became insolvent. For this reason, many consumers avoided payment institutions and chose banks in order to protect their money, thwarting the good intentions of the regulators (Nilsson, 2018).

When it comes to the scope of regulation, some of the payment services already used in practice were not classified as such or regulated at all,⁴ giving their providers an advantage in the market. On the side of demand for such services, natural persons were affected the most as they used these services much more than legal persons. This mostly referred to online payments. In addition, many provisions of the directive turned out to be too generalised, unclear or even obsolete in light of market development. This has resulted in "legal uncertainty, potential security risks in the payment chain and a lack of consumer protection in certain areas."⁵ In practice, this meant that, in case of unconfirmed fraudulent payments, the payer did not have adequate legal grounds for complaint. For this reason, though the initial intention was to enable users to use payment services provided by any service provider within the European Union, as many as four-fifths of Europeans continued to prefer providers from their home state (Nilsson, 2018; 29). According to Donnelly, perhaps the most obvious disadvantage was missing the opportunity to regulate two important services: payment initiation and account information services.

2.2 Payment Services Directive 2 – PSD2

The Second Payment Services Directive 2015/2366 (PSD2) was created to close the gaps of PSD, provide more legal clarity and ensure a consistent application of the legislative framework, enabling new means of payment to reach a broader market, and, most importantly, ensuring a high level of consumer protection and transparency.⁶ As specified in Article 107 of Directive 2015/2366, this implies the need for full harmonisation to minimise the possibility of different interpretation of the provisions.

This Directive, fully implemented as of 2018, requires banks to allow access to information about their clients to all providers – third parties – payment institutions, FinTech companies and other credit institutions – subject to client's consent. Banks are required to share the transaction data of their clients and to enable payment initiation. The intention was

⁴ Directive (EU) 2015/2366, recital (29).

⁵ Directive (EU) 2015/2366, recital (4).

⁶ Directive (EU) 2015/2366, recital (6).

to ensure a uniform and decentralised payment system as a basis for further development of e-commerce and online payments. This makes PSD2 both an *ex post* response to the development of the payments market, and an *ex ante* driver of further development.

The key difference between PSD and PSD2 is in the scope of regulation. The second directive covers more payment services and more types of market players, allowing access to payment service users' account information to all participants.

2.2.1 *New payment service providers*

The second directive recognised two new types of payment service providers: account information services providers (hereinafter: AISP) and payment initiation service providers (hereinafter: PISP). They belong to the group of third-party providers. These are payment institutions with which consumers do not have payment accounts and which do not hold the funds whose transfer they initiate.

Payment initiation service is defined as “a service to initiate a payment order at the request of the payment service user with respect to a payment account held at another payment service provider” (Directive 2015/2366). In practice, this service is provided when a user selects a product in an online store via his mobile phone and enters his account data. He then gets to choose the payment instrument, such as PayPal, card payment or PISP payment, usually in the form of the Pay by bank, Pay through bank, etc. option. When the user selects payment through a third-party provider, in the next step he chooses the service provider and the account from which to make the payment, if there are several. The user is then offered a choice between traditional banks and new participants such as FinTech companies, neo banks,⁷ etc. Upon selection, the user confirms his identity and the payment is made. Among the largest providers of such services in Europe are the British Volt and the Swedish Trustly.⁸

Account information service is defined as an “online service to provide consolidated information on one or more payment accounts held by the payment service user with either another payment service provider or with more than one payment service provider” (Directive 2015/2366). This information is provided through an application which aggregates data on transactions and balances from several payment accounts in one place. The main idea is to make it easier for the user to manage personal finances. It is precisely the AISPs that develop and offer such applications in the market. Both AISP and PISP services can be provided only subject to clear consent of the client, i.e. payment service user.

New market participants were now able to offer financial services based on the banks' information and infrastructure. However, banks can themselves also become PISPs or AISPs in the market. This is interesting because they are thus given access to information on the accounts of customers of other banks – their competitors.

⁷ Neo banks are financial institutions which base their business on advanced technologies and do not have a network of physical branch offices, but operate on digital banking platforms.

⁸ An interactive animation of the entire process of payment through these service providers is available at the website of the above payment institution: <https://www.volt.io/>.

2.2.2 Application programming interface

The PISPs and AISPs were able to provide their payment services before PSD2 was implemented, but only based on special agreements with financial institutions that held customers' payment accounts and account information. This was a barrier to growth in the number of participants and market competition.

For this reason, Articles 35 and 36 of PSD2 envisage that “payment institutions shall have access to credit institutions' payment accounts services.” This means an obligation for banks to allow access on an objective, non-discriminatory and proportionate basis, in a way that allows payment institutions to operate in an unhindered and efficient manner. Under the Directive, access to accounts and account information no longer depends on a contractual relationship with a bank, as it did when PSD was in force. This is known as the access to account rule – XS2A.

It is important that banks do not apply the XS2A rule at their own discretion, but in line with the Regulatory Technical Standards (RTS) developed by the European Banking Authority (EBA) in cooperation with the European Central Bank. The RTS suggest that banks can allow access to third parties in two ways: by letting the third party apply the bank's own application solutions (e.g. m-banking) or by establishing a dedicated application programming interface. An API is a “set of rules or protocols that enables software and applications to communicate with each other to exchange data and functionalities” (IBM, 2024).

Such interfaces are not a novelty – they have long been used by banks and companies wishing to integrate different applications and facilitate interorganisational information flows. When both the API producer and user belong to the same organisation, this is a private API. When a bank allows a key stakeholder to use an API due to different types of business synergies, this is a partner API. Public APIs are available to all and their use does not depend on a business relationship with the organisation that created them. This type of interface enables all authorised third parties to build new services on top of the existing infrastructure of a bank and it is precisely this type of interface that banks must use to comply with PSD2 (Moen & Helgøy, 2018).

In this way, PSD2 set up a new minimum of information to be shared in the payments market. This minimum refers to information on clients' payment accounts. If they wish, banks may offer a wider range of information, e.g. on savings accounts, loan repayments, etc.

Three approaches can be identified in the response banks took to PSD2 in order to preserve their market position, particularly in the light of new market participants such as FinTech companies. The first is the compliance approach, where the new directive is treated as a regulatory and technical compliance issue. Banks solely focus on implementing the regulatory necessities, such as a basic set of APIs. Though this approach requires the least effort, it is risky in the long run, as it increases the risk of falling behind market development and more agile competitors.

A proactive approach was taken by the banks which decided to provide new, value-added services themselves. They regarded the new regulation as an opportunity rather than a mandatory regulation and used this opportunity by developing their solutions internally, expanding the product catalogue and becoming digitally more competent, e.g. by investing in

internal IT departments. In this way, some banks started providing account information or payment initiation services themselves. Another option of the proactive response was collaboration of banks in the same market, involving a blend of cooperation and competition – co-competition. Though this can be risky because of the potential stealing of clients, benefits prevail – encouraging investment, economies of scale, exchange of knowledge and experiences which can strengthen their competitive position against new market entrants. Some banks have, however, seen an opportunity precisely in new market entrants, through potential synergies resulting from the combination of different key competences: stable infrastructure, user and resource base of banks with innovative culture, digital expertise and the innovative culture of FinTech companies (Moen & Helgøy, 2018).

A third option for banks was to respond to new regulatory circumstances by even more openness, i.e. by sharing a broader scope of data than requested by PSD2. This business model is known as open banking.

3 Open banking and open finance

PSD2 is considered to be the main driver for open banking as it has obligated banks to open their data to all interested third parties in the market, which can provide an even wider range of services than those enabled by the mandatorily shared information. This platformisation of the banking ecosystem is similar to the transformation in tourism (Air BnB) or transportation (Uber). Even when it comes to payments, an already well-established example comes from China where applications such as AliPay or WeChat function successfully, integrating options for the provision of different types of services, including payment services. The value of platforms rises with the number of users, which is a textbook example of network externalities.

3.1 Features and possibilities of open banking

Though there are as many definitions of open banking as there are markets which apply this concept, it can be said that open banking is “the financial technology innovation whereby consumers allow financial services providers to access and aggregate their financial information for wider and more competitive choices of financial management” (Oi Chan, 2020). This means that payment services provision is further decentralised by enabling third parties to access data through API.

According to the Juniper market research agency (2024), open banking was valued at USD 57 trillion in 2023. Open banking transaction values are expected to exceed USD 330 bn. Such growth is feasible, as this concept is used by a long list of users: from individual payment service users, through financial institutions, FinTech companies, SMEs and regulatory authorities, to e-commerce platforms. Thanks to improved access to financial data, they can all simplify payment procedures or improve income flows in another way.

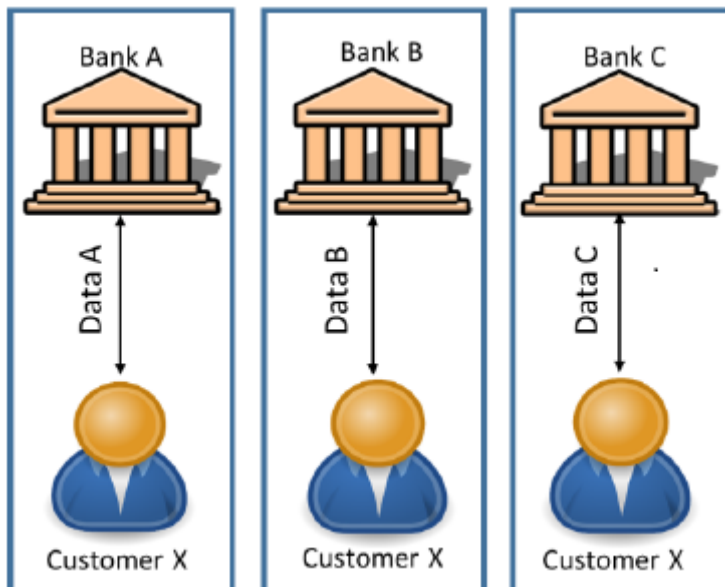
Open banking is not a specific product or service – it is a technological and business framework for developing and providing numerous and different financial services. Though

this is an evolving field, here are some of the ways open banking is most often used (Stripe, 2024):

1. *Payment initiation services* – Payment institutions can initiate payments directly in the name and for the account of a payment service user, bypassing the need for a traditional payment gateway;
2. *Account aggregation* – Companies can pull in more data from multiple accounts, which enables more accurate and personalised services, i.e. services with greater added value;
3. *Instant loans and credit scoring* – Financial institutions can access real-time data to assess credit more accurately, speeding up loan approval processes;
4. *Automated invoice reconciliation* – Companies can use open banking to automate some regular payments, reducing administrative work and improving accuracy;
5. *Multibanking platforms* – Corporations operating in multiple markets could consolidate their accounts from different banks into a single dashboard, making it easier to monitor financial operations;
6. *Personalised marketing* – Companies can analyse transaction data to provide targeted promotions or advertisements that are directly relevant to an individual’s spending habits;
7. *Real-time fraud detection* – By analysing transaction data instantaneously, businesses can detect unusual activity more easily, reducing financial and operating risks.

Below is an illustration of the difference between the current model of banks’ operations and open banking. In Figure 1, the information flows are bilateral and the payment service user shares separate sets of information with each of the payment service providers with which it has a contractual relationship.

Figure 1 Information sharing before open banking

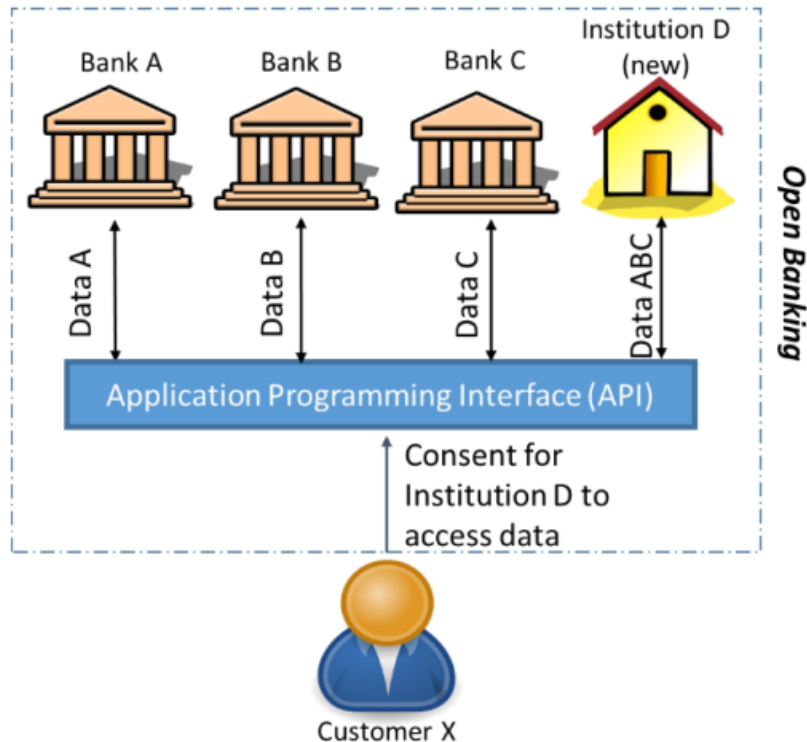


As in: Oi Chan, 2020.

By giving consent to open banking, on the other hand, the consumer shares information with financial institutions, even if he does not have a contractual relationship with them. In

return, based on the consumer's financial picture, financial institutions can offer better and more personalised services.

Figure 2 Information sharing in open banking



As in: Oi Chan, 2020.

Another advantage of open banking is operational agility, as open banking offers accelerated data flows, creates an environment where FinTech companies and banks can innovate jointly, enables a more effective use of personnel, and, perhaps most importantly, allows for more direct payment methods resulting in lower transaction costs (Stripe, 2024).

It seems that open banking and similar data sharing models might favour better informed, technologically literate users. Yet, open banking can foster financial inclusion – by improving the process of borrowing and saving money, managing monthly bill payments, and other financial soundness indicators (Reynolds & Chidley, 2019). PSD2 has encouraged the development of new services targeting underbanked groups, such as credit assessment, faster loan approvals and different solutions for mobile payments (Vives, 2019). Not only individuals but even inclusive-finance organisations can benefit from open banking. Thus, open banking may empower the activities of what has been termed “MicroFinTech” (Moro-Visconti, 2021), an organisation created by the convergence of microfinance patterns with FinTech applications.

Like any technological advancement, open banking may be a challenge in terms of data vulnerability, inconsistent quality of service provided by third parties, potential incompatibility between different services and software solutions of companies with API platforms, etc. For regulators, increased complexity of the open banking system makes regulation more challenging, requiring more resources. This might result in the establishing of

special teams whose dominant task will be to deal with all aspects of markets based on the open banking technology. This does not mean that data sharing models are not advancing – to the contrary. For this reason, below we give an outline of the open finance concept.

3.2 Features and possibilities of open finance

Open finance is an expanded open banking concept. While open banking introduces the account information services and payment initiation services, open finance includes products and services beyond the scope of payment services. This means that third parties gain authorised access to a wide spectrum of consumer data concerning various accounts, including savings, investments, insurance, mortgage data, etc., which would be used to create more personalised products and services. One of the definitions of open finance is that it is “the next step of open banking, allowing third-party service providers to access a wider range of customer data from various accounts, including savings, investments, pensions and insurance” (Open Banking Ltd, 2024). The goal of open finance is similar to that of open banking – giving consumers greater control over their financial data.

The main advantages of open finance could include the following (Kiskyte, 2023):

- i)* Improved user experience – automatization of money transfers between different accounts, such as savings or investment accounts;
- ii)* Better financial management – enabling consumers a holistic view of their finances by combining all important information in a single place;
- iii)* Improved business efficiency – just as open banking increased the efficiency of payment methods, open finance can create even more options in other segments of business;
- iv)* More innovation and competition.

When speaking of financial inclusion, we recognise the potential of open finance in low and medium-developed countries. Even more than open banking, open finance enables the underserved population to acquire data sharing mechanisms that use a wider range of data in order to thus gain access to a broader spectrum of services otherwise unavailable to them. This particularly pertains to the unbanked part of the population as it enables a potential transfer of data from non-traditional sources (e.g. e-money account) to information systems of traditional service providers such as banks.

Although customer transaction data sharing typical for open banking models is most often at the heart of open finance definitions, the majority of open finance models regulates the sharing of the following types of data (Plaitakis, *et al.*, 2020):

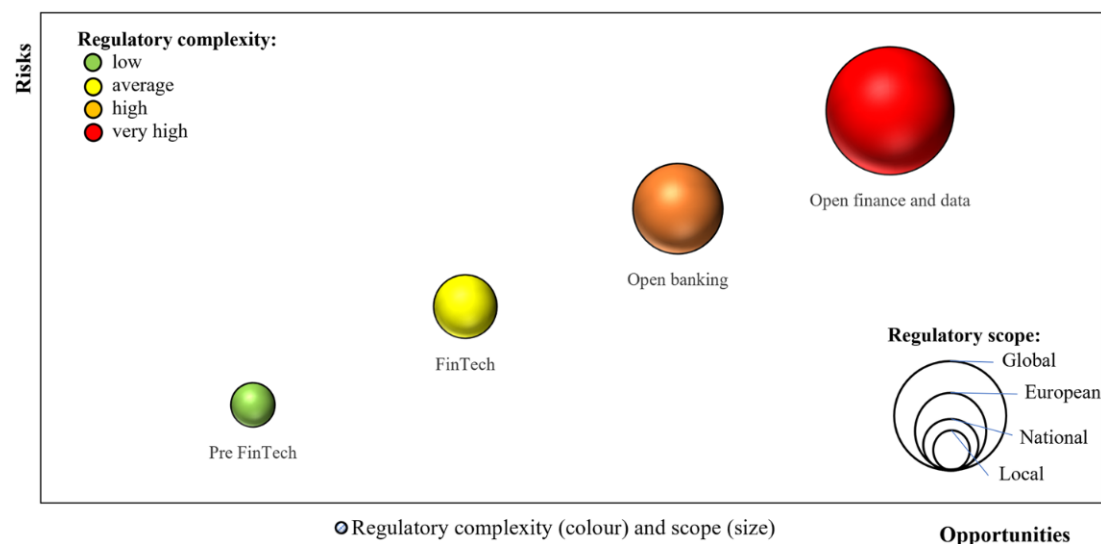
1. Generic services data, i.e. publicly available information on specific financial services, locations of ATMs, branches or offices. They do not carry personal data based on which someone’s identity could be determined.
2. Customer data which are required when opening an account and for administrative purposes, including registration and KYC data.
3. Transaction data, including data about account balances, transaction values with currency dates, identity of the other party in the transaction, etc.

In addition to open banking and open finance, as the third level of sharing – and as such, the widest – we have open data. These are data that can be freely available to all to be used in any way, for any purpose, with no copyright limitations or control mechanisms (Кривокапић и др., 2019). Open data is the exchange of consumer data between different private and public sector institutions, including banks and non-bank payment service providers, providers of telecommunication, utility and similar services, with customer consent (Medine & Plaitakis, 2023). The mutual relationship between the three levels of data sharing is illustrated in Figure 6.

Accordingly, increased data sharing in the open finance context can result in end-users not fully understanding what it is that they are consenting to, increasing their vulnerability to financial crime, fraud and scams (Truchet, 2023). Financial institutions may face various operational risks such as API security risk, risks arising from stronger interconnectedness with third parties, cyber-risks, as well as a possible shortage of staff and skills for managing all the risks in an increasingly complex environment. On the part of the regulator, no major risks to the country's financial system stability are expected given that, due to its size, open finance still does not have the potential to become a source of systemic risk.

This means that any scope of data sharing, beside the benefits, also brings some regulatory risks arising from the complexity of the data sharing infrastructure. Accordingly, Figure 3 shows the increasing levels of regulatory complexity and scope surrounding financial markets through four periods: before 2008 and the emergence of FinTech companies; the FinTech period (2008–2018); the open banking period from 2018 until today; and the upcoming period of open finance and open data. Moving from left to right, increased regulatory complexity (from low to high) and scope (from local financial services to global) require credible and comprehensive regulation.

Figure 3 **Inclusive finance – regulatory complexity and scope**



As in: Preziuso *et al.* (2023), p 24.

To successfully manage the described risks, and for regulators to ensure that the development of data sharing platforms – such as open banking and open finance – does not threaten their main objectives in any way – including price and financial stability objectives

of central banks – these regimes must be adequately regulated. Accordingly, the following section is dedicated to the practice so far in the functioning of these data sharing models.

4 Data sharing in practice

This year, the number of users of open banking-based services is projected to exceed 132 million (Zimpler, 2024), while the total value of open banking transactions equalled USD 57 billion (Statista, 2024). At the moment, the most promising is the European market, accounting for 49% of all global users.

When it comes to regulations within the European Union, open banking is limited to the said payment initiation service providers and account information service providers. So far, more than 350 such participants have been registered in the European Union, and more than 330 in the United Kingdom alone.

The implementation of open banking in the United Kingdom was entrusted to the Open Banking Implementation Entity (OBIE),⁹ in line with the existing regulatory preconditions in the country (The Payment Services Regulation 2017, PSR – equivalent to the EU’s PSD2). The implementation unfolded in cooperation with EcoSpend, the first company in the world to set up an integrated open banking system that enables the execution of A2A instant payment via pay by bank account. In 2018, secure data sharing was enabled within the open banking system and, by extension, the provision of better-quality and more personalised financial products and services under fairer terms. After five years of implementation, there are almost seven million regular users of open banking technologies in the UK and more than one billion API calls a month, as at December 2022 (Gov.uk, 2023). As a leading national European market, the United Kingdom has developed many practical uses of open banking-based services – from collecting property rental payments, through advisory services, to increased efficiency of collecting payments for public sector products and services. A large part of the improvement pertains to the comparable cheapening of transactions executed in the open banking environment.

The latter stands out in particular, given that tax authorities in this country have estimated that the cost of an open banking payment is less than taking a card payment and have therefore enabled payment services to citizens for more than 40 different types of taxes and customs via open banking. In January 2024 tax authorities collected GBP 3.5 billion in tax payments via open banking, or 16% more than in the same period a year earlier (Open Banking Ltd, 2024).

According to data of the Organisation for Economic Cooperation and Development (OECD), data about the current data sharing frameworks, such as open banking, attest to the positive impact on consumers and the financial services market. Open banking has, namely, encouraged innovation and competition, decreased costs and enabled a better consumer experience (OECD, 2023), which is particularly true for European Union countries.

⁹ The development of open banking began after the report of the main regulatory authority for the protection of competition which stated that the largest market players did not have to compete hard enough and smaller and new participants found it hard to access the market and achieve sustainable growth. At that point the implementation of open banking was declared an obligation for the nine largest market participants in Great Britain and Northern Ireland (CMA9).

An equally important aspect of open banking is the fact that financial services are becoming more available to the unbanked population by improving the business models pertaining to lending, savings, management of regular payments such as household bills and the financial wellbeing of consumers. The share of this population in the European Union more than halved in the period 2017–2021, contracting from 31 to 13 million, i.e. to less than 4% of the population (WSBI-ESBG, 2022). Considering the large difference in the shares of the population that does not use or has no access to financial services (from 0.00% in Denmark to 30.88% in Romania), open banking could have the biggest potential precisely in the countries faced with this type of problem. According to the estimate of the Boston Consulting Group (2023), almost 80% of adults globally are still unbanked or underbanked.

This does not mean that there are no challenges. To the contrary, it has been recognised that the open banking ecosystem still does not function as intended (European Commission, 2023). Namely, last year's proposed text of the future payment services directive (PSD3) recognises the need for additional strengthening of competition in the market and the position of third-party payment service providers relative to traditional banks. This mostly pertains to (Loyens & Loeff, 2023):

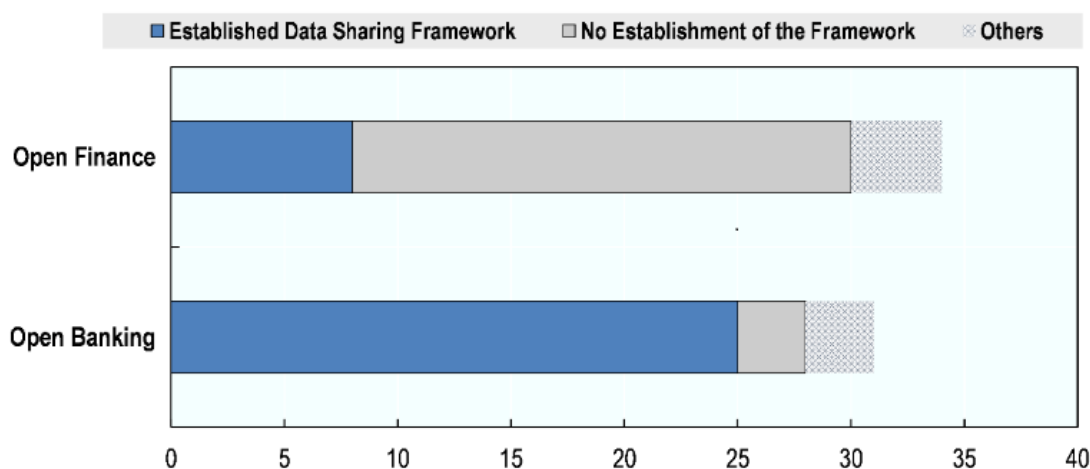
1. Further SCA enhancements;
2. Expanding the reach to bank accounts for payment and e-money institutions;
3. Removing obstacles hindering data access for third-party providers and stifling innovation;
4. Allowing direct participation to non-bank payment service providers in all payment systems in the EU.

This time, the European legislator plans to introduce changes by improving the present payment services directive, but also by introducing the Payment Services Regulation (PSR). This will eliminate disparity in the implementation of unified rules by different member states given that the regulations are “more direct” when it comes to practical implementation.

In view of the described relationship between the respective scopes of open banking and open finance, it must be said that the majority of OECD countries still lacks a definitive legal definition of open banking, though it is understood as described in the paper. Countries with explicitly defined open banking frameworks include Australia, Brazil, Columbia, Israel, South Korea and Turkey. In Israel, a law from 2021 sets out that sources of information (mostly banks) have to share their data with third-party providers. In Turkey, open banking is defined as “an electronic distribution channel through which consumers [...] can perform payment transactions by remotely accessing the financial services offered by the bank through methods such as API, web service, file transfer protocol.” In South Korea, the relevant financial services commission established an open banking policy in order to enhance competition in the financial market and maximise the welfare of consumers. This allowed third-party providers to have access to the previously unavailable infrastructure.

Open finance is defined in an even fewer number of cases and generally builds on the open banking definition to expand to other data sources and types. In Israel, the open finance framework includes payment accounts and data about payment cards, deposits, savings, loans and securities. For instance, in Australia open finance is defined as non-bank lending, and the provision of insurance and pension fund management services (OECD, 2023).

Figure 4 Established framework for open banking and open finance in OECD countries



Source: OECD (2023), p 10.

In June 2023, in line with the Digital Finance Strategy, the European Commission published a proposed regulatory framework for Financial Data Access (FiDA), which will pertain to access and continued use of user data, with consumer consent, in many areas of financial services. This would be based on the principle of user control of data supplied to market participants and generated based on user behaviour. The goal is to enable more innovative financial products and services, as well as to encourage competition in the financial sector. This regulation should pertain to the following categories of data (Hoogeveen, 2024):

1. on mortgages, loans and accounts, except payment accounts regulated under PSD2, including data on balances and transactions;
2. on savings, investments and financial instruments, insurance-based investment products, crypto, financial and other assets, as well as data about the economic benefits arising therefrom;
3. on the rights arising from operations with pension funds, defined in the Directive 2003/41/EC;
4. on non-life insurance, excluding data on sickness and health insurance products;
5. data which forms part of a creditworthiness assessment related to firms, collected in the loan application or credit rating assessment processes.

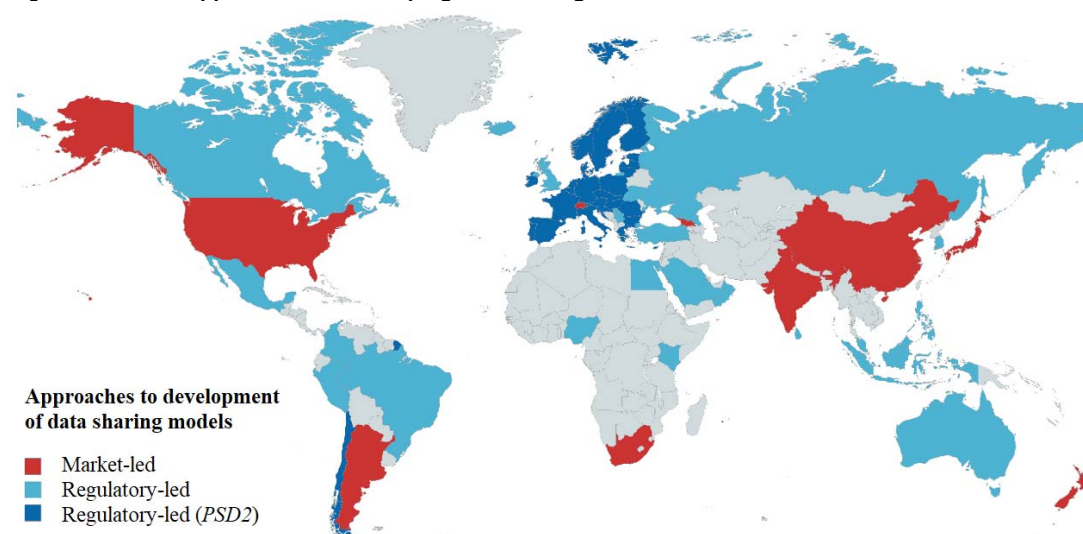
The above implies the possibility, though not an obligation, for consumers to share their data with financial institutions or other participants. On the other hand, it also implies an obligation of financial institutions and other holders of consumer data to make these data available to all potential users (other financial institutions or third parties) by setting up the necessary technical infrastructure. In return, they will be encouraged to set up high-quality interfaces for third parties, i.e. data users, with clear rules as to the mechanism for resolving any disputes. Also, users will be given full control over who and why is accessing user-related data.

Unlike the EU and other regulation-led countries, some countries have adopted an industry-led approach to developing data sharing models. In the USA, innovative companies in the field of financial technologies recognised the benefits of accessing data as a means to

enable better services for payment service consumers, while banks took up the initiative and developed solutions to allow consumers to share their user data. The key position in this country has been taken by the Financial Data Exchange (FDX), a consortium of private participants (financial institutions, FinTech companies, data aggregators, etc.), which formulates open standards for financial data sharing and operates in Canada as well. Some countries, such as Nigeria, changed their approach after their central bank introduced a legal framework to regulate the existing activities of market participants.

Since an analytical overview of the experiences of countries that have made progress in data sharing models would greatly exceed the scope of this paper, as well as its purpose, below is a figure with an overview of global progress in this field.

Figure 5 Different approaches to developing data sharing models



Source: Author's analysis based on the data from openbankingmap.com.

4.1 Open finance in Great Britain

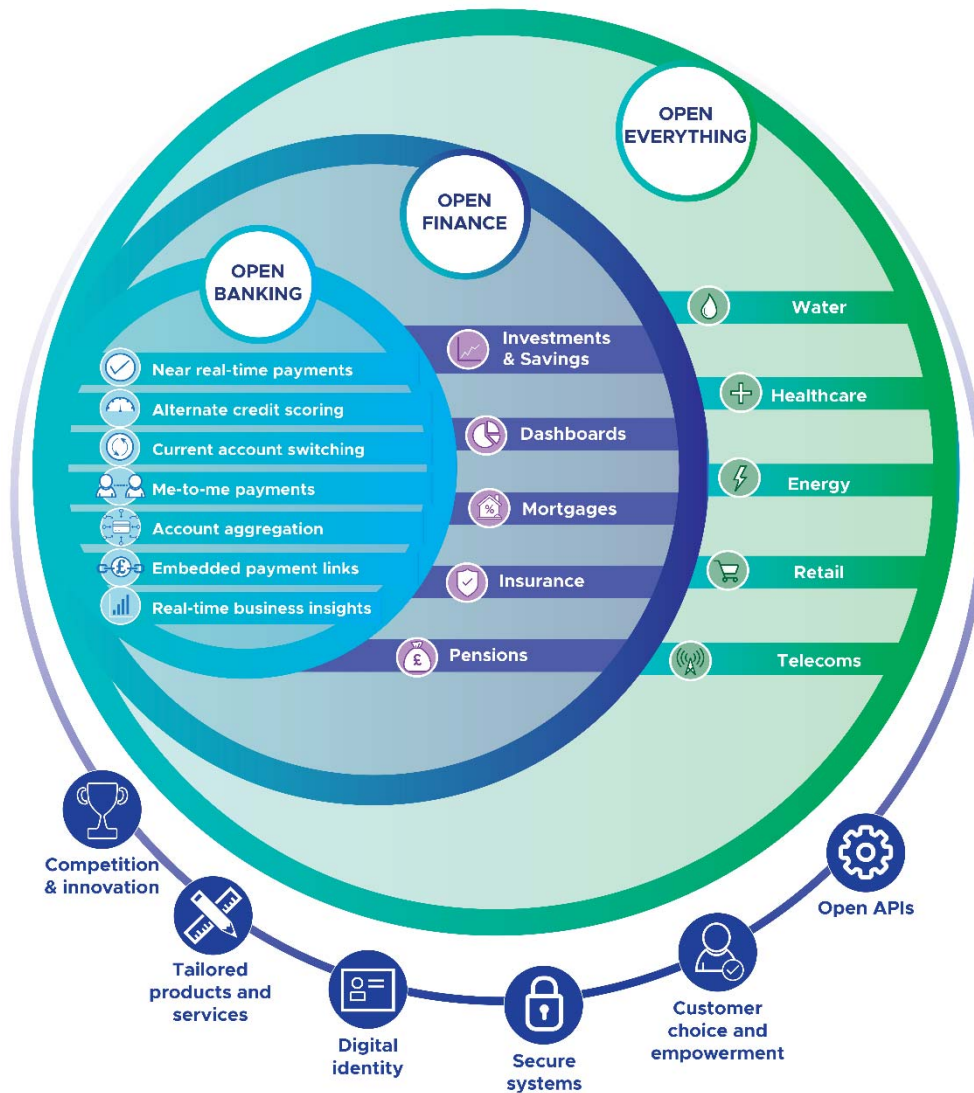
The regulators and the market in Great Britain are evolving from open banking to open finance. For more than six years, open banking has been mandatory, and there are currently more than nine million users of products and services via apps within this ecosystem (Open Banking, 2024). Concurrently, the services enabled by open banking are used by around 750,000 small enterprises. As stated on the official website on open banking services, open finance will extend these benefits to mortgages, pensions, investments and savings, while “applying the same sharing principles to other key sectors will lead to the open everything concept.”¹⁰

Practical implementation does not always unfold ideally, and there are often misunderstandings in the markets, even scepticism as to the benefits of open finance. In this regard, a useful research has been conducted, titled “Open Finance Paradox” (Cognizant, 2022). Open finance industry players are divided into several groups: neo banks, as the most

¹⁰ Open data, as the broadest scope of data sharing.

agile part of the market; incumbent banks, which are still in a risk/reward conundrum; leading banks (CMA9) which understand the benefits and threats, but still do not cooperate enough; challenger banks, which are ready to push, but still lack confidence in their ability; and, finally, building societies,¹¹ which are slower, more reactive and inclined to turn a blind eye to business risks.

Figure 6 From open finance to open data in Great Britain



As in: Open Banking Ltd, 2024.

At the moment of this report, open finance was in a development stage, as substantiated by the data that in the 2020–2023 period transactions arising from this ecosystem’s framework, as well as the number of users, have increased many times over: the number of users from one to seven million (almost 13% of the adult population), and transactions from around 5.3 to

¹¹ Small financial institutions owned by their members, rather than shareholders, traditionally engaged in providing financial and lending services, notably in housing construction. They are a feature of all British Commonwealth countries and are the most conservative organisations in the market.

26.6 million. The average number of products and services based on the open finance model equalled 2.4 for all payment service providers – the lowest for building societies (0.5), and the highest for neobanks (5.5). The survey-like report included viewpoints of more than 200 financial institution managers.

In their response to the question: “What are the main benefits of open finance for your organisation?”, neo banks recognised the greatest potential in open finance because the highly innovative nature of the business model best fits with their business priorities. Leading banks also see a potential in it, primarily as a method for further digitalisation and cutting down operating costs. In contrast, the remaining participants mostly see the introduction of open finance as an act of meeting regulatory demands. It is interesting that 57% of managers from incumbent banks think that open finance is an over-hyped concept, whereas as much as 92% of neo bank managers stated that open finance is important for the future success of their organisation. This difference can be explained by the level of understanding the benefits of open finance. As much as 90% of neobank managers stated that they “fully understand the benefits of open finance” in contrast to merely 23% of incumbent bank managers. The percentage of all interviewed managers who are completely unfamiliar with open finance is 3%.

Not accidentally, there are a mixed opinions about open finance: many decision makers do not immediately see the benefits of open finance for their clients, therefore they do not invest sufficient efforts to implement the concept successfully. Even if they did, there would be obstacles, the most important being a lack of resources, and technological and security factors. This is an average assessment for all types of financial institutions, with resources posing an issue for 58% of neo banks, and culture issues (such as user conservatism) for three-quarters of leading banks.

4.2 Open finance in Brazil

Brazil is among the most successful countries when it comes to implementing open finance, with 41 million accounts within the system and more than 27 million active users, or 16% of the adult population. The main task of implementing the open finance system was to accelerate and improve the functioning of the banking and payment services market by promoting inclusion and competition, not jeopardising the security of consumer data or safety of the financial system.

When developing data sharing models, the idea of the regulator was that the competitive advantage in the market is not based on capital, but on the ability to predict and adequately understand the dynamic needs of consumers. This is important, considering that more than 170 banks operate in the Brazilian market, the biggest six of them¹² accounting for around 70% of the financial market.

Brazil’s current level of data sharing development is the result of a series of reforms that build on each other, both with regard to infrastructure development and to regulation. The first major step was made in 2002 with the launching of the retail payments modernisation project

¹² The largest of them both in Brazil and the continent – Itaú Unibanco – has the capital of around USD 360 bn.

(Vidal *et al.*, 2023). This transpired at a time when the Central Bank of Brazil projected a new payment system to modernise the procedures and reduce systemic risks, which had been impacted by inflationary pressures for a long time. A law regulating the work of payment institutions was adopted in 2012, and financial inclusion was further enhanced in 2016 by lowering the requirements for poorer citizens when opening a digital payment account and using payment services. In May 2018, the Central Bank of Brazil set up a Financial and Technology Innovation Laboratory (LIFT) to encourage technological innovation in finance and cut costs and efficiency of the national payment system. Initially, 18 projects in blockchain technology, AI, cyber-security tools, etc. were included in its scope (Banco Central do Brasil, 2019). The following year it became possible to test open banking solutions (Regulatory Sandbox), and in 2020 the PIX instant payment system began to operate.

The implementation of open finance unfolded gradually by broadening the scope of the shared information/services.

- Phase one (early 2021): Sharing of information by financial institutions about products and services;
- Phase two (mid-2021): Sharing of registration and transactional data about products and services from the previous phase;
- Phase three (2021–2023): Introducing payment initiation services via PIX,¹³ allowing account holders to make payments using the open finance ecosystem;
- Phase four (starting from 2023): Enhancing the data sharing scope, including data on products and services of currency exchange, time savings accounts and other services in the area of insurance, investments and pension funds.

Data sharing is based on an open integrated platform that ensures secure, fast and easy sharing. Open finance participants are responsible for the security of shared data, transparency of data handling, as well as their quality (integrity, reliability and availability). Also, they are responsible for acting in accordance with the principles of user equality, reciprocity and interoperability. All the mentioned activities take place only after the consumer approves them in a free, informed and unequivocal decision. This authorisation is given through a specially designed electronic interface, is valid for 12 months and can be withdrawn at any time at his request – for which secure, precise and simple procedures are provided. Data sharing exclusively with a user's consent is a fundamental principle of open finance. Data sharing procedures and processes must be in accordance with the data protection law (General Data Protection Law, 2019).

Participants in Brazilian open finance can only be institutions licensed by the Central Bank of Brazil. They must submit a proposal for an interface solution (API) intended for sharing data and services, which will be accessed through digital means and without restrictions on their use.¹⁴ Also, they must comply with the established rules, procedures and standards for monitoring envisaged by the open finance ecosystem.

¹³ Launched in late 2020, today it processes more payments than the card systems and is used by 92% of all payment services consumers.

¹⁴ According to a report of the Central Bank of Brazil, there were 26,099,733 successful API calls in April 2021, which accounts for 99.67% of all calls and indicates the efficiency of the system in the mentioned period.

Figure 7 **Key building blocks in the development of Brazil's inclusive data ecosystem and open finance**
As in: CGAP, 2024.

Indicative policy measures	Building blocks	Indicative success metrics
Establishment of open banking regime (2020) and expansion into open finance (2022)	Open Finance	41M accounts in open finance and 800+ financial service providers
Reforms to ease licensing and market entry of new financial service providers, including fintech	Diversity of providers	1,500+ fintech startups—most in the region; \$10B+ fintech lending portfolio
Launch of Pix by Central Bank of Brazil (2020)	Fast digital payments	453M accounts registered on PIX as of September, 2023
Early adoption of agent banking models and proportional payments regulation	Digital accounts	77% of the adult population has reported making or receiving a digital payment (FinDex 2021)

Depending on the scope of shared data and services, the regulation foresees the existence of mandatory and voluntary participants: mandatory participants are those financial institutions whose economic size reaches 1–10% of Brazil's GDP or which perform relevant international activities independent of capital. These are “Regulatory segment 1” (S1) and “Regulatory segment 2” (S2), where the first segment includes entities as big as or bigger than ten percent of GDP or having relevant activities, while the second includes those with a size of 1–10% of GDP (Banco Central do Brasil, 2020). Voluntary participants are all institutions that wish to participate, and their size does not belong to either S1 or S2. This is a specific type of segmentation of financial institutions, created so that the Central Bank's measures would affect the participants proportionately. The principle of reciprocity is also important, i.e. that participants who receive information must also share information with others.

The number of ways in which open finance can be used is continuously growing. They relate to managing personal and business finances, paying money from multiple accounts at once, simply moving financial assets from account to account without leaving the open finance environment or even the main account interface, personalised offers, opening an account in another bank based on data already owned by the primary bank without the need to re-enter data, etc. Banco do Brasil payment account holders can use the bank's official WhatsApp channel for easier access to the bank's various services.¹⁵ Also, for example, users of the Nubank's FinTech app receive a notification if any of their accounts has a negative balance; if the user has funds in other accounts, optimisation is suggested in order to avoid problems with overdraft.

As for the user base and awareness and acceptance of the concept of open finance, survey analyses (Vidal et al., 2023) showed that fintech companies are more successful in obtaining user consent than the traditional ones, especially large banks. According to data from the end of last year, about 56% of open finance users are women. Advanced financial inclusion is evidenced by the fact that 96% of the population has a bank account, and 98% of all used

¹⁵ An overview of options available when using this app is available at: <https://www.bb.com.br/site/pravoice/atendimento/whatsapp-bb/>.

mobile phones are smartphones, necessary for the functioning of open finance. Within the poor population segment, 92% of people own a bank account and 96% own a smartphone. Of the bank account users among the poor, 71% of people chose to open an account with a traditional bank and the rest with a digital bank.

An analysis conducted on a sample of two thousand people showed that 52% of people are not even aware of the existence of open finance. Of those aware, the majority heard of open banking through their mobile banking app, while the next most frequent source are conversations with family and coworkers. Data were also collected on users' willingness to share data, and it turned out that:

1. willingness to share is higher for high income segments;
2. willingness to share decreases for older age groups;
3. men are 40% more willing to share data than women.

The analysis concluded that the main obstacles to greater acceptance of open finance are insufficient awareness and understanding of the concept, for which the English name of the brand (Open Finance) is responsible, the fear of risks associated with sharing sensitive data, especially the risk of adopting something new, and there is also a kind of a stigma due to the worry that a previous bad experience with one bank could negatively affect the future relationship with another bank. It can be concluded that the main drivers of open finance are digitalisation and the population that participates in it.

4.3 Institutional assumptions for data sharing in Serbia

In the Republic of Serbia, the open data and data sharing initiative is at an early stage. There is a great demand for open data from the civil society and the business community. The first open data appeared in 2015 in the work of the Ministry of Education, Science and Technological Development, and in the same year a study on the readiness of our country for open data was published. In it, the integration of open data into the existing e-government strategy was assessed as an "excellent basis and starting point" for the further development of data openness and sharing. It was also stated that the country's legal framework is sufficiently established to serve as a basis for implementing an open data programme (UNDP, 2015). As part of the Open Data Initiative from 2015, the Open Data Hub was created as a unique address for all participants in the open data ecosystem – individuals, startups, companies, media and the rest of the civil sector – to support the opening and use of open data.

The opening of data is a strategic commitment of the Serbian Government, recognised in the Strategy for the Development of eGovernment and the Action Plan for the Implementation of the Open Government Partnership Initiative in the Republic of Serbia. Data from the national Open Data Portal¹⁶ are automatically published on the European Open Data Portal as well.

¹⁶ The Open Data Portal (<https://data.gov.rs/sr/>) is the hub where open data of public institutions are consolidated and made available to citizens and the private and non-government sector. It currently has 2,667 sets of data.

The stated demand for open data is a dynamic category and depends on the knowledge and awareness of the value of open data. One of the important measures in this field was the Open Data Week, organised by the Office for Information Technologies and eGovernment, and the United Nations Development Programme to mark the International Open Data Day. Workshops, lectures, seminars and conferences on the features and possibilities of applying open data are organised in several cities.¹⁷

When it comes to data sharing from the perspective of payment and financial services, the Republic of Serbia is developing a technical-infrastructure and normative framework for alignment with the best international practices. The focus of regulatory activity is primarily reflected in the adoption, amendment and implementation of the Law on Payment Services (RS Official Gazette, Nos 139/2014 and 44/2018).

In other words, the Law on Payment Services and the corresponding secondary legislation are fully aligned with the relevant regulations of the European Union – the Payment Services Directive (PSD) 2007/64/EC, E-Money Directive 2009/110/EC, the provisions of Directive 98/26/EC on settlement finality, as well as the Payment Accounts Directive 2014/92/EU. As for Directive 2015/2366 (PSD2), as a cornerstone for the development of the data sharing model, the National Bank of Serbia has largely harmonised the legal framework with this regulation, bearing in mind the provisions that were foreseen in the previous Directive 2007/64.

With the adoption of the Law on Payment Services, realistic assumptions were created for the development of a modern, comprehensive and efficient payment system in the Republic of Serbia, based on market principles, as well as in line with the standards accepted at the time by advanced countries in this field. That law further improved and modernised payment transactions in the country and abroad, and improved the framework for increasing competition and innovation in the payment services market between existing and new payment service providers, such as payment institutions and electronic money institutions.

Amendments to the Law from 2018 improved the transparency and regulated the comparability of fees charged to payment service consumers in connection with their payment accounts, defined the rights of payment service consumers regarding changes to payment accounts, and prescribed the conditions and method of exercising the right to open and close a payment account with basic services free of charge or with a reasonable fee for unbanked citizens. By improving the volume of data that payment service providers submit to the National Bank of Serbia, the quality of reporting on the provision of payment services and the issuance of electronic money has increased.

¹⁷ An interesting example is the first Datathon in Serbia, held in 2018, focused on the visualisation of open data sets found on the Open Data Portal. At the time, the winning team used open data about the locations of primary and secondary schools in Belgrade and matched them with data about the locations of betting shops downloaded from another website. Since the Law on the Games of Chance prescribes the minimum distance of a betting shop from primary and secondary school buildings of 200 meters, mapping showed that this provision of the law was violated in 70 locations. Another case of good practice is the cross-checking of data from the Geosrbija portal with data from the Ministry of the Interior on the number of traffic accidents, which showed that the highest frequency of accidents on the Pančevo bridge in Belgrade is right in the middle of the bridge. This suggests that accidents could be prevented by installing additional cameras and warnings at that location.

However, the changes in the last few years, detailed in this paper, gave rise to the need to ensure a more comprehensive and effective protection of payment service consumers and, to an even greater extent, the stability of the financial and payment systems as a whole. It is recognised that the current framework established by the said law no longer provides adequate conditions for further development of the payment services market in our country, or the real economy. Therefore, in June of this year, the National Bank of Serbia prepared Draft Amendments to the Law on Payment Services with the aim of further encouraging innovation in the market and ensuring greater competition and transparency in the field of payment services, as well as greater consumer protection and payment security. This includes the regulation of open banking, with associated new services and operations of payment service providers. The draft defines the payment initiation service as “a service to issue a payment order at the request of the payment service user with respect to payer’s payment account held at another payment service provider”¹⁸ – and the account information service as “an online service to provide consolidated information on one or more payment accounts held by the payment service user with either another payment service provider or with more than one payment service provider.” The Law Amending the Law on Payment Services (RS Official Gazette, No 64/2024) was adopted by the Serbian National Assembly on 31 July 2024 and entered into force on 8 August this year, while its implementation will begin on 6 May 2025.

The law provides a clear, comprehensive set of rules that will be applied to existing and new payment service providers, with a special focus on the security of electronic payments, as well as security measures to protect the confidentiality and integrity of data. At the time of writing this paper, the adoption of these amendments is expected to bring numerous benefits for all payment service consumers – primarily in the form of greater consumer protection, a broader range of services, lower costs – but also for the entire market of payment services in the Republic of Serbia, as it implies establishing a legal basis for the development of new, innovative business models and services.

5 Conclusion

The continuous growth of the world economy is increasingly accompanied by a growing volume and complexity of generated data, resulting in the need to improve the methods of their acceptance, systematisation and processing. Information technologies, and especially the internet, are becoming key determinants of the information society, which is characterised by increasing connectivity and speed of information exchange at the local, regional and global levels. Automatisation, robotics, artificial intelligence and machine/deep learning are just some of the technologies in which these trends are manifesting. The use of the internet has greatly changed the organisation and operations of banks and other financial institutions, while on the demand side it has led to the popularisation of modern non-cash payment instruments such as digital banking, digital and crypto-currencies, and other financial technologies. The

¹⁸ Law on Amendments of the Law on Payment Services, available at: http://www.parlament.gov.rs/upload/archive/files/lat/pdf/predlozi_zakona/14_saziv/Predlog%20zakona%20o%20izmenama%20i%20dopunama%20Zakona%20o%20platnim%20uslugama%20LAT.pdf

growth of the financial technology market itself is higher than the average growth of the world economy, which speaks volumes about the disruptive potential of this activity, especially when it comes to banking.

One of the prerequisites for achieving this potential is the development and integration of data sharing models into existing and future business models. Data sharing is becoming an increasingly important factor in innovation and growth of economic efficiency and productivity. In this way, data have become both a working tool and a resource created by using different digital solutions. This means that, in addition to being cooperative, data sharing has a competitive dimension as well. The application of data sharing models in banking and finance in a broader sense is recognised in the practices of open banking and open finance.

The aim of the paper was the analysis of those concepts. Open banking is an innovation in the field of financial technology, which allows consumers to give consent to payment service providers accessing their financial data based on a common technological standard, and service providers can manage those data in a competitive and innovative way. Within open banking, the set of new innovative services is limited to those related to payment initiation and account information. Open finance, on the other hand, represents an expansion of the scope of data sharing, i.e. third-party access to data, so that it includes other financial businesses such as insurance, savings, investments, etc. These models are expected to continue the decentralisation of the provision of banking and financial services, to demonopolise the possession of data and to further encourage competition and innovation, with the aim of generating value for end users.

The analysis of these concepts was first performed by presenting a brief history of the regulation of payment services, with reference to data sharing, and especially in terms of the Second Payment Services Directive of the European Union 2015/2366, its provisions and the way in which market participants adapted. Next, the topics of open banking and open finance were addressed separately, from the point of view of the definition, the scope of the term, the services they entail and their application in practice. The application itself is presented on the examples of Great Britain and Brazil, whose markets are among the most developed ones in terms of data sharing models globally.

Open finance is a near future in the Republic of Serbia as well, considering the new Law on Payment Services, which was recently adopted with the goal of encouraging innovation in the market and ensuring conditions for enhancing competition and transparency in the work of payment service providers, as well as for greater protection of consumers and payment security. In line with the advances made in the most developed markets, the new regulation will, among other things, regulate the work of two new payment service providers – account information service providers and payment initiation service providers.

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