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**Recommendations and standards:
Implementation support material**

Report of Finance and Payment Domain on Open Finance to Support Trade Facilitation

Submitted by the Bureau

Summary

This report investigates the economic paradigms of open banking and open finance to understand how they can facilitate trade worldwide. It provides an overview of open banking in the European Union and in seven other countries. In addition to defining fintech and open finance, the paper describes open finance use cases for trade facilitation and suggests a way forward for policy and decision makers.

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I. Introduction

1. Over the last few years, the payments landscape has massively changed. The use of advanced technologies by traditional and new financial services providers, including fintech, Big Tech and challenger banks, have increased the level of competition and the overall degree of innovation. In the open finance scenario, public administration, corporate and retail customers are enabled to choose among a variety of products, that go beyond traditional banking functionalities.
2. The goal of the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) Finance and Payment Domain is to investigate the economic paradigms of open banking and open finance in order to understand how they can facilitate trade worldwide.
3. Far from being a comprehensive analysis of the complex and innovative open finance landscape, this document aims to pave the way for further studies on this topic, to be carried out by UN/CEFACT and other international organizations.

II. Open banking: the global big picture

4. In the last ten years, open banking has emerged as an international economic paradigm. Powered by different drivers, open banking has been mainly the consequence of legislative obligations and market-driven initiatives.
5. According to a 2021 CBI-PwC report¹ “open” initiatives are currently live at the international level and each country identifies the best approach to follow, according to its specific objectives and/or needs.
6. These initiatives are at various stages of maturity: early stage ones such as those ongoing in Saudi Arabia and Canada where open banking initiatives have not been formally launched; to more mature ones such as those in Australia where open banking (and also open data) regulation has been fully in place since 2019; to Singapore where open banking/finance application programming interface (API) standards have been re-released by the Monetary Authority of Singapore through an API playbook.
7. These initiatives move at various paces: from slower ones such as in Mexico where the fintech law was instituted in 2018 but no further steps in data openness have been reported; to quicker ones such as in Brazil where an open finance framework has been developed from scratch.
8. Open banking initiatives follow different approaches: from fully regulated ones, such as in the EU, Nigeria, Australia or Singapore, to fully market-driven ones, as in the case of the USA, where open banking initiatives (e.g. API standardization) are driven by market players.
9. This chapter sheds light on the development of open banking, highlighting the experiences of different European countries and other extra-EU examples.

A. Open banking in Europe: the case of the PSD 2 in the European Union

10. In the European Union (EU), the Payment Services (PSD 2) Directive 2015/2366/EU gave the green light to open banking in Europe. The PSD 2 replaced the previous payment

¹ PwC-CBI, Global Open Banking Report, see <https://www.cbi-org.eu/Media-Events/Report-and-Research> (2021)

services directive (2007/64/EC)², which created a single market for payments (i.e. credit transfers, direct debits, cards) and introduced the legal framework for the Single euro payments area (SEPA).

11. Following the adoption and implementation of the PSD, new market players and services emerged within SEPA, which were out of scope of the directive. Taking into account this development, the EU institutions updated it with the PSD 2 in order “to make payments safer, increase consumer protection, foster innovation and competition, while ensuring a level playing field for all players, including new ones.”³

12. The renewed directive allowed account servicing payment service providers (ASPSPs) to share certain data from their customers’ online bank accounts with third-party providers (TPPs), after having acquired the customer’s consent. From a technical perspective, application programming interfaces (APIs), which allow communication between software, have been identified as the most suitable technology to enable this data sharing among payment service providers (PSPs).

13. The PSD 2 has enabled third-party providers to operate as account information service providers (AISPs) and payment initiation service providers (PISPs). While AISPs provide clients with a complete overview of their online bank accounts through unique front-end solutions, PISPs enable their customers to use payment initiation functionalities without accessing, directly their online banking or using their credit or debit cards.

14. Besides opening the market to new business models, the PSD 2 strengthened security protocols to be adopted by PSPs for e-transactions. PSPs apply strong customer authentication (SCA) “where the payer accesses its payment account online, initiates an electronic payment transaction, carries out any action through a remote channel which may imply a risk of payment fraud or other abuses.”⁴ Furthermore, the PSD 2 affirms that “member states shall ensure that payment service providers have in place adequate security measures to protect the confidentiality and integrity of payment service users’ personalized security credentials.”⁵

Box 1:

Collaborative platforms to support the spread of open banking in Italy and Europe

CBI Globe – Global Open Banking Ecosystem

CBI is a public limited consortium company which comprises around 400 payment service providers as shareholders and customers. Operating from a business-to-business-to-customer (B2B2C) perspective, CBI delivers digital payment products and services that its shareholders can offer to their public administration, corporate and retail customers. In doing so, CBI allows the interaction between different ecosystems and proves to be a collaborative platform, backing the development of interoperable and circular services at the domestic and European level.

Following the evolution of the European payment regulatory framework, in 2019 CBI launched an API-powered regtech platform, CBI Globe – Global Open Banking Ecosystem – to support the Italian banking community in complying with the PSD 2.

² Directive 2007/64/EC of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC And 2006/48/EC And Repealing Directive 97/5/EC

³ European Payments Council, “PSD2 Explained”, April 2018

⁴ Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directive 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC, art. 97

⁵ Ibid.

Thus far, 80 per cent of the Italian financial market has adopted the platform to meet the operational and technical requirements imposed by the renewed payment framework.

In 2020, CBI Globe developed a new functionality that allowed bank and non-bank PSPs to perform the role of third-party providers (TPPs) as payment initiation service providers (PISPs) and account information service providers (AISPs).

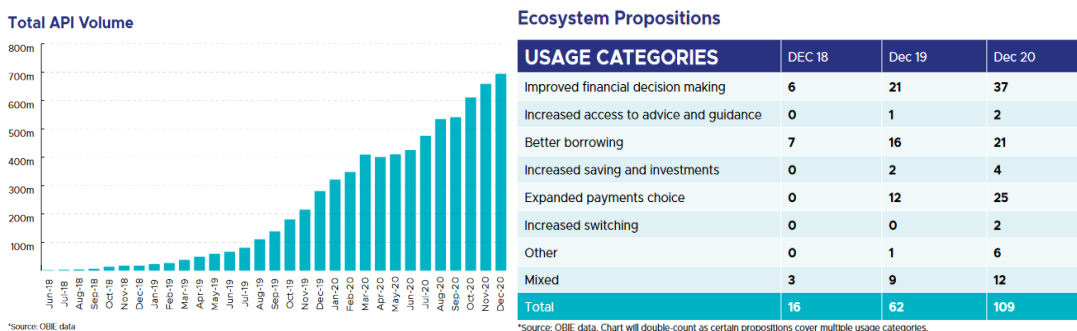
15. Having only been implemented in 2019, the PSD 2 has not yet achieved its full potential. Nonetheless, market players have already started developing value added services which go beyond mere compliance. With the aim of keeping up with the rapid evolution of the European markets, the EU legislator has already started reviewing the payments regulatory framework with the goal of proposing a review of the PSD 2 at the end of 2021 and an open finance legislative framework before mid-2022.

B. Open banking in the United Kingdom

16. In 2016 the Competition and Markets Authority (CMA) in the UK set up the Open Banking Implementation Entity (OBIE) to implement open banking standards.⁶ This entity successfully established open banking standards comprising technical API specifications, customer experience guidelines and operational guidelines.⁷

17. Today, over three million UK citizens and small businesses are active users of open-banking-enabled products. The ecosystem has 301 firms active in the market and another 450 in the pipeline.⁸ This success is illustrated by the quickly increasing total API volume as well as the development of a large catalogue of open-banking-based use cases:

Figure 1:
Growth of API volume and open banking use cases



18. Pursuing its mission to enable open banking, the CMA—based on OBIE’s work—is regularly updating its roadmap to enhance the experience of both service providers and end users. In its latest roadmap⁹, the CMA announced its intention to add functionalities and items in the coming months, including the following:

⁶ For more information, see <https://www.openbanking.org.uk/about-us/>.

⁷ OBIE, “Open Banking Annual Report 2020”, p. 8. Available at <https://assets.foleon.com/eu-west-2/uploads-7e3kk3/48197/obie-ra-artwork-10096a5716bf30-2.5853a6c2c203.pdf> (accessed 05 May 2022).

⁸ Ibid., p. 4.

⁹ CMA, “Retail Banking Market Investigation Order 2017: Notice of approval of changes to the Agreed Timetable and Project Plan”, (15 May 2020). Available at

- Reverse payments (refunds) through which PISPs will be able to easily action a reverse payment to satisfy a customer's entitlement to a refund
- Sweeping, which includes use cases such as being able to automatically move funds between accounts of the same beneficiary/owner, to earn interest, mitigate fees or borrow on less expensive terms
- Variable recurring payments

19. In addition, OBIE started working on premium open banking standards (also known as premium APIs) by hosting a self-funded project outside the scope of the CMA order, thus going beyond a regulatory initiative.¹⁰

20. In December 2019 the Financial Conduct Authority (FCA) published a Call for Input to explore the opportunities and risks arising from open finance. After analysing the large number of responses, the FCA concluded in March 2021 that a legislative framework would be needed for open finance to develop fully and that it should be completed using key building blocks including consumer protections informed by an ethical framework, a liability model, common standards (for APIs and user experience), an implementation entity funded and governed equitably, and digital identity.¹¹

21. The Bank of England supports and recommends a fully interoperable API-based data sharing platform across the whole economy.¹² This includes the development of a portable credit file to give consumers access to more diverse and competitive financing options, including global trade. A data 'token', encrypted end-to-end and shared via APIs with a built-in expiration date, has also been floated as an idea to give consumers better control over shared access to data.

22. A large development of open finance is, thus, on its way in the UK and will most probably benefit from the successful open banking experience.

Box 2:

Innovative UK fintech companies leveraging open banking data

iwoka

This fintech start-up gives small businesses fast and flexible access to capital without the upfront fees, lengthy forms and long-term commitments traditionally associated with business credit. For its risk model, iwoka uses big data techniques to assess small businesses' trading data to perform a quick, informed assessments of risk and what credit limit they are subsequently willing to grant, ranging from one month's revenue up to £200,000. There are no upfront fees. It charges a basic interest rate starting at two percent, which increases the longer businesses take to pay.

Credit Kudos

This credit bureau uses a credit-scoring mechanism that takes in more current data on a person to give a fuller picture of their credit than the traditional agencies. Credit Kudos aggregates and interprets transaction data for use by lenders, brokers, and financial

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/885537/Notice_of_proposed_changes_to_the_open_banking_roadmap_-_web_publication_-_cma_gov_uk_-_May_2020_.pdf (accessed 05 May 2022).

¹⁰ OBIE, Open Banking Annual Review 2020, p. 4.

¹¹ FCA, Feedback Statement FS21/7, "Open Finance", March 2021, §5.2.

¹² Bank of England, "The Bank of England's Response to the Department for Business, Energy & Industrial Strategy", (August 2019); available at <https://www.bankofengland.co.uk/media/boe/files/research/the-boes-response-to-the-beis-on-the-smart-data-consultation.pdf>.

institutions. The service can also be white labelled by other lenders to help them onboard and approve more customers.

Mojo Mortgages

Mojo Mortgages is an online mortgage broker that helps people borrow to buy a home. As a market broker, Mojo lets users explore mortgage deals from more than 90 lenders and get expert advice on the best option. The company has designed MortgageScore™, which combines credit and open banking data to determine if a customer is mortgage ready. The coaching feature provides personalized advice on how users could improve their score and improve their chances of getting a mortgage.

C. Open banking in Switzerland

23. The PSD 2 obligates banks in Europe to open up their banking systems. In Switzerland, there is no analogous regulation and no established technological standard. Thus, banks can drive and steer this development themselves. To fill this gap, the Open Banking Project initiative was founded.

24. The founding body brings together several manufacturers and operators of core banking software, a bank, a university, and expertise in IT, research, and consulting. Moreover, the project itself is open to additional members as well as the Swiss NextGen API—the first API standard for Switzerland.

25. The Swiss NextGen API is designed to retrieve account information and initiate payment orders according to the specifications valid in Switzerland.

26. The solution is based on the open industry standard NextGenPSD2 framework created by the European standardization initiative Berlin Group. This standard is widely used in Europe and is constantly being developed. Building on the Swiss NextGen API, Swiss companies and especially banks can efficiently create new offers for their customers and future-proof them.

Box 3:

Innovative open banking business models in Switzerland

TWINT

The payment execution application known as TWINT allows customers to transfer money directly from person to person, to make cashless payments in stores, to conduct transactions online, and to pay securely from their own bank account or conveniently via debit from their credit card¹³. The Swiss company TWINT was created from a merger between the company of the same name and its competitor Paymit. TWINT, itself, was launched by Postfinance. Paymit, on the other hand, was the result of collaboration between stock exchange operator SIX Swiss Exchange, the major bank UBS AG and Zürcher Kantonalbank. The merger of the two providers took place in October 2016. As of September 2019, TWINT had around 1.7 million registered users making around 4

¹³ Swiss Bankers Association, Positions papier PSD 2, (2017). Available at https://www.google.it/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjIz_PFvxX3AhX5QvEDHZCqAzcQFnoECAMQAQ&url=https%3A%2F%2Fwww.kreditwesen.de%2Fsites%2Fdefault%2Ffiles%2Fcontent%2Farticledownloads%2F2017%2F39%2Fpositionspapier-psd2.pdf&usg=AOvVaw36J

million transactions per month on average. TWINT is already a recognized payment method at virtually all major retailers, and the company is rapidly expanding¹⁴.

eBill

Another Swiss digital application is eBill. This application allows for the digital verification and payment of e-bills. The recipient and the beneficiary of the payments are authenticated by the bank¹⁵. As of April 2018, eBill already had over 1100 participating companies as well as 90 participating banks and 1.2 million registered users. The new infrastructure for digital bills was developed by the exchange operator SIX Group in close collaboration with Swiss banks and the financial community. Private individuals can opt to switch to eBill through their house bank and thus receive bills via e-banking. The implementation of eBill marks another milestone in the modernization of Swiss payment traffic with customers benefiting from a simplified, user-friendly process. The eBill solution aims to become the Swiss standard for digital bill payment.¹⁶

QR code invoice (QR-bill)

Another Swiss innovation is a payment receipt with a QR code (QR-bill) that carries all the information about the payment, thereby linking the paper-based world with the digital one.¹⁷

The payment section of the new QR-bill uses the international bank account number (IBAN) and a data code called the Swiss QR Code. This code contains all the information relevant to the payment and prints additional information in a readable form. The QR-bill has been available since 2020. The QR-bill fulfils all important regulatory requirements related to the revised Anti-Money Laundering Ordinance¹⁸.

D. Open banking in Ukraine

27. To date, the payment and settlement systems in Ukraine have been regulated by the Payment Systems and Funds Transfer in Ukraine (hereafter, in this section, referred to as the Law), which was adopted in 2001 and reviewed in 2012. The Law regulates financial services related to the transfer of funds. However, recent worldwide open banking innovations have rendered the Law outdated.

28. In line with the EU-Ukraine Association Agreement, Ukraine has undertaken to implement both the PSD 2 and Directive (EU) 2009/110/EU, the e-money directive. To this end, in 2020 the Ukrainian legislator created Draft Law No. 4364 “on Payment Services” (hereinafter - the draft law). Besides implementing the two above-mentioned directives, the draft law proposes introducing several types of payment services, in addition to the two mandatory services established by the PSD 2, namely account information and payment initiation services.¹⁹

¹⁴ TWINT, “TWINT Nutzer sollen in Europa bezahlen können”, (2019). Available at <https://www.twint.ch/press/twint-nutzer-sollen-in-europa-bezahlen-koennen/>. (Accessed 16 May 2022.)

¹⁵ Swiss Bankers Association (2017).

¹⁶ SIX, “E-bill becomes eBill: Credit Suisse is first bank to successfully upgrade”, (2018). Available at <https://www.six-group.com/en/newsroom/media-releases/2018/20180525-eBill.html> (accessed 16 May 2022).

¹⁷ Swiss Bankers Association (2017), see <https://www.swissbanking.ch/en/news-and-positions/news/discontinuation-of-payment-slips-switch-to-qr-bill-or-e-bill-now>

¹⁸ This refers to the Swiss Financial Market Supervisory Authority (FINMA) Anti-Money Laundering Ordinance.

¹⁹ The services are related to, among the other things, cash credits and withdrawals to/from user accounts; to the execution of payment transactions; issuing or acquiring payment instruments; and to e-money payment transactions.

29. The draft law should replace the current Law, establishing requirements for improving transparency in payment and information services, providing a clear division of responsibilities and rights for users and service payment providers, as well as defining risk management and user authentication clauses.

30. In February 2021, a resolution on the adoption of the draft law of Ukraine “Payment Services” was adopted. According to experts from the National Bank of Ukraine, the adoption of the bill will allow for the implementation of European open banking standards in 2022.

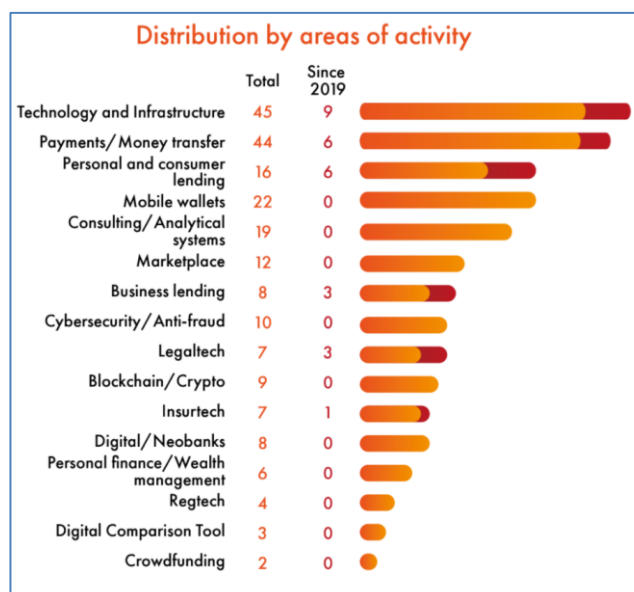
31. Needless to say, the goal of the Ukrainian payments regulatory framework is also to support the development of open banking and fintech services in the country. At the beginning of 2018, fintech was in its infancy and had more than 60 companies with different degrees of maturity. Privatbank, the largest fintech company in the country, was ahead of the Ukrainian and European markets. However, fintech only began to grow in 2017 after a number of events and forums were dedicated to this topic. An important example was the Open Banking Lab project, which began in the autumn 2017 and gathered participants of the financial market, including fintech, start-ups, banks, and regulators. Participants in the incubation program were selected during the hackathon in November 2017.²⁰ The project continued for the first three months of 2018. During this amount of time, the selected teams received training through lectures held by industry experts, met mentors and created projects based on open data from banks.

32. In 2018, fintech companies were providing services as follows: payments and remittances - 32%; technology and infrastructure - 19%; lending - 14%; marketplaces - 7%; insurtech - 5%; digital and non-banks - 5%; financial management - 5%; mobile wallets - 5%; blockchain - 3%; cryptocurrencies - 2%; regtech - 2%.

33. In 2019, more than 100 fintech companies were delivering functionalities in the Ukrainian market, including services related to e-banking, automation, biometric identification, machine learning and artificial intelligence, forecasting and modelling, smart cards, chatbots, blockchain, big data, digitization of all registers, IT security, cybersecurity, payment security, and open API.

²⁰ Participants were bNnesis (a service that helps banks and borrowers find a common language); ChurnAI (Artificial Intelligence Routing by the CML Team—the service predicts the outflow of clients from the bank and helps prevent this process); Future Agro Finance (Agro RSI—a platform for finding finances for agricultural companies; CoinyPay—a service for making payments); YouScore (FinScore—a tool for analysing the business model and financial stability of a business); Sky Service FIN (online cash desks in the cloud, allowing you to control the receipt of funds remotely 24/7); CyberDataVizor (a cybersecurity solution); MarketBOX (a service for managing orders from several marketplaces in one interface).

Figure 2:
Ukrainian market distribution of fintech companies



34. In an effort to support the development of financial technologies, in 2020 the National Bank of Ukraine developed a five-year fintech development strategy. Its key task is to create a regulatory field, policies and procedures that would stimulate the growth of fintech, including acceleration programs, international agreements, a "sandbox" to test innovations in the regulatory field, and link to other expert consulting platforms such as the UK Financial Conduct Authority (FCA) and the Monetary Authority of Singapore (MAS) ones.

E. Open banking in Nigeria

35. On 17 February 2021, the Central Bank of Nigeria (CBN) issued the local regulatory framework for open banking. It aims to promote innovation, broaden the range of financial services and products available, and expand financial inclusion in Nigeria.

36. Open banking is one of the most important regulations to come to banking in the last decade, and it will be a gamechanger. Thanks to the CBN framework, Nigeria will become Africa's open banking pioneer. The important thing about the framework is that it establishes principles for data sharing across the banking and payments ecosystem. The framework provides for several issues, including data and API access requirements, technical design and information security specifications.

37. Data and services that can be shared through APIs are categorized as follows:

<i>Category</i>	<i>Description</i>
Product information and service touchpoints (PIST)	This includes product information provided by participants to their customers and access points available for customers to access services (e.g. ATM/POS/agents' locations, channels (website/app) addresses, institution identifiers, service codes, fees, charges, quotes, rates, tenors, etc.).

<i>Category</i>	<i>Description</i>
Market insight transactions (MIT)	This includes statistical data aggregated on the basis of products, service, segments, etc. It shall not be associated with any individual customer or account. This data may be exchanged at an organizational or industry level.
Personal information and financial transaction (PIFT)	This includes data at the individual customer level (e.g. know-your-customer data, total number or types of account held, etc.) or data on the customer's transaction (e.g. balances, bills payments, loans, repayments, recurring transactions, etc).
Profile, analytics and scoring transaction (PAST)	This includes information on the customer which analyses, scores or gives an opinion (e.g. credit score, income ratings etc).

38. The CBN intends to promote standards for the safe use and exchange of data and services and has defined data access levels (i.e. what bank data can be shared and who can obtain it). However, the successful implementation of open banking depends on the collaboration between fintech, banks, other financial institutions and the CBN.

39. There are some challenges with open banking, particularly around cybersecurity, data privacy and the resulting liabilities to financial institutions. Issues around data breaches, hacking, phishing scams and malware should be taken into consideration by any institution considering open banking and the use of APIs in the open Internet environment (so called "open APIs").

40. Also, with the Nigeria Data Protection Regulation (NDPR), which is very close to the European Union General Data Protection Regulation (GDPR), the legal basis for processing data must be taken into consideration before the financial records of customers are shared. Direct consent must be obtained from the customer in line with the provisions of the framework, as failure to do this could lead to severe consequences for the financial institution that shares the data.

41. Thanks to the open banking effort by traditional financial institutions, customers will be provided with consolidated information about all their financial products in a unique application. This would reduce time spent in carrying out transactions and minimize the paperwork for onboarding new users.

42. The introduction of the CBN framework is a good development which could potentially lead to the improvement of financial services delivery in.²¹

F. Open banking in Australia

43. Australia is the worldwide pioneer in the open banking, finance and data fields. The open banking framework is based on a prescriptive approach represented by a set of rules

²¹ International Bar Association, "Open banking and emerging opportunities for Fintechs in Nigeria", (24 June 2021) available at <https://www.ibanet.org/fintechs-in-Nigeria> (accessed 16 May 2022).

covering several areas of digital interactions—from financial services developing open banking to other industries such as telcos and utility.

44. The development of a national Consumer Data Right (CDR) (announced by the federal government in late 2017) has provided individuals and businesses with the right to access specified data held by their businesses and to authorize secure access to this data by accredited data recipients (e.g. banks, telco providers, energy companies). In this context, the CDR, and the following open banking initiative, has been launched with the aim of enhancing data privacy and empowering citizens to have greater access, use and control of their own data.

45. In contrast to active regulations of other countries, which have set up dedicated frameworks for specific sectors, the Australian regulator has developed a unique framework (i.e. the CDR) which is expected to be gradually implemented on a sector-by-sector basis, beginning with banking, energy and telecommunications, and extending to other financial services (such as asset and wealth management and insurance) and other non-financial services industries. The government is addressing de jure a real open data scenario.

46. Banking was the first sector to adopt the CDR under the nomenclature “open banking”. The objective of the mandatory data was defined in a phased approach, starting with bank account data and later including data on mortgages and end-consumer loans²².

47. The Australian Competition and Consumer Commission regulates the activities of four major banks: NAB, CommBank, ANZ, and Westpac. Also, it issues accreditations for financial companies (including fintech) that have decided to adopt new regulations. Open banking’s massive launch should strengthen fintech’s position against Big Four²³ dominance.

G. Open banking in India

48. The Indian market represents a very particular case which is moving towards open banking and beyond. To date, no formal regulation or API standards have been defined; however, the local government is supporting a range of measures to promote competition in the banking sector. Increased adoption of open banking and finance across the country has been enabled by technology and standardization initiatives, along with the fact that major banks have developed API portals to collaborate with Indian fintech companies.

49. Despite the absence of a formal regulation, open banking and open finance development in India has been boosted by different levers; among them, the relevant ones are represented by the implementation of a set of APIs through India Stack²⁴ that allow governments, businesses and developers to access a technology platform via the Aadhaar national identity number system, and the development in the same India Stack of an instant real-time payment system (Unified Payment Interface) to facilitate interbank transactions.

50. Another relevant initiative, promoted by local regulators, that has boosted the country’s digitalization process is the Indian demonetization policy.²⁵

²² PwC-CBI, Global Open Banking Report , see <https://www.cbi-org.eu/Media-Events/Report-and-Research> (2021)

²³ The Big Four are Google, Amazon, Apple, and Meta (facebook).

²⁴ India Stack is the name of a set of open APIs and public digital products involving consumer identity, data, and payments.

²⁵ PwC-CBI, Global Open Banking Report , see <https://www.cbi-org.eu/Media-Events/Report-and-Research> (2021)

H. Open banking in Japan

51. Japan is adopting an organic approach to open banking. Although it is not mandatory, leading Japanese banks and fintech firms have started experimenting with APIs to build partnerships and participate in digital ecosystems.

52. In Japan, the Financial Services Agency (FSA) has established an authorization process for third-party providers (TPPs), introduced an obligation for banks to publish their open API policies, and encouraged banks to contract with at least one TPP by 2020. The majority of Japanese banks have taken this regulatory encouragement very seriously and committed to fulfil the requirements.

53. Japan was among the first Asian countries to establish its own open banking framework. In 2015, Japan's FSA established a consultation desk to make payments more accessible. However, the initiative was just the foundation for open banking.

54. In the next couple of years, the Bank of Japan amended the Banking Act two times. In 2017, it changed the amount of ownership banks must have in fintech. Next, it released a framework for regulating e-payments. In 2018, the FSA opened the Strategy Development and Management Bureau to devise a new financial services strategy with fintech as the driving initiative.

55. Japan's economy relies heavily on cash, with banks focusing on cashless transactions and digital payments. The demand for these payment types has grown rapidly due to the 2020 Tokyo Olympics, though the Japanese authorities postponed it.²⁶

56. The measures to adopt open banking are versatile. Yet, the most common ones are the collaboration between national and regional partners and partnerships between banks without building API portals. Despite the scope of initiatives, many Japanese banks have decided to team up once they become compliant with the new regulations. The main dispute has been about the need to charge for API usage, which has led to a risk of reverting to traditional screen scraping²⁷ techniques.

III. A definition of fintech

57. The term 'fintech' is one few people used to know, but it has become a phenomenon that has a real impact on people's private and working lives.

58. Today, there is no globally recognized definition of the word. Fintech represents the beginning of digital technologies that are changing the financial market, innovating it in a significant way from the developer and service provider points of the view. In the financial sector, there are countries that are more inclined to innovation, and others, such as Italy, which have always been anchored to elements such as family savings, bank credit, and small and medium-sized enterprises (SMEs).

59. Thus far, fintech companies have invested in all countries. The majority of people (especially the young) use at least one fintech or insurtech service, receiving functionalities that are generally perceived as very satisfactory.

²⁶ ReadWrite, "The Many Faces of Open Banking: Australia, the U.K., and Japan" (8 March 2021). Available at <https://readwrite.com/2021/03/08/the-many-faces-of-open-banking-australia-the-u-k-and-japan/>.

²⁷ Screen scraping is the act of copying information that appears on a digital display so it can be used for another purpose.

60. The fintech world is constantly and continuously changing the habits of consumers and businesses in many countries, influencing the choices that are made in the financial and insurance fields.

61. The feature that is most often considered positive is the total disintermediation of the banking world that, favoured by new technologies, is making the phenomenon of open banking possible. The spread of fintech solutions within the background of open banking has fostered the creation of new services, including easier online payments, the management of separate accounts on a single dashboard, and more timely financing management, just to name a few examples.

62. To better understand why fintech is so relevant, two macro categories of functionalities can be identified:

- Services that existed before the advent of fintech, such as foreign currencies payment management, which can now be provided more efficiently and at lower costs; and
- Services born after the arrival of fintech technologies, which have allowed for the emergence of new services that were previously impossible to create due to the lack of the necessary technology (which in this case has been a key enabling factor).

IV. What is open finance? The main characteristics of the economic paradigm

63. According to the United Kingdom (UK) Financial Conduct Authority, open finance is “the extension of open banking-like data sharing and third-party access to a wider range of financial sectors and products.”²⁸

64. Today, the provision of financial services is not only a prerogative of traditional financial institutions (FIs). Over the last few years, new players have emerged in financial markets, eroding the market share of incumbent banks and increasing the overall level of competition.²⁹ Examples of new players are large technology companies (big tech), fintech enterprises, and challenger banks.

65. Interestingly, financial services offered by incumbent and new payment service providers (PSPs) are not only traditional payment and bank account functionalities. By taking advantage of the opportunities stemming from the application of advanced technologies—application programming interfaces (API), blockchain and distributed ledger technology (DLT), artificial intelligence (AI) and machine learning (ML)—PSPs have developed innovative financial and insurance products to single out their supply and have shed light on cost-efficient business models.

66. Against this background, both traditional and innovative players have developed new type of partnerships.

67. On the one hand, fintech companies have been able, over time, to realize agile and customized micro-services oriented to meet customer expectations and needs. Therefore, banks have experienced the pressure to upgrade their business models to maintain a high degree of competitiveness in the financial arena and to avoid losing market share.

²⁸ Financial Conduct Authority, “Call for Input: Open Finance”, December 2019, p. 3. Available at <https://www.fca.org.uk/publication/call-for-input/call-for-input-open-finance.pdf> (accessed 16 May 2022).

²⁹ Navaretti, Giorgio Barba; Giacomo Calzolari and Alberto Franco Pozzolo, “FinTech and Banks: Friends or Foes?”, *European Economy: Banks, Regulation and the Real Sector*, year 3, issue 2 (Europey srl: February 2017). Available at https://european-economy.eu/wp-content/uploads/2018/01/EE_2.2017-2.pdf (accessed 16 May 2022).

68. On the other hand, both traditional and new PSPs have started understanding the value of cooperation.³⁰ Banks have perceived the opportunity to turn themselves into a marketplace, providing their clients with cutting-edge functionalities realized by fintech companies. On their hand, fintech companies have figured out that cooperating with banks allows them to reach to a larger set of clients. Considering the mutual benefits derived from cooperation, banks and fintech companies have strengthened their partnerships.

69. Far from being a consolidated strategy, traditional and new players will need to foster this trend in the forthcoming years, thus giving light to innovative business models and enhancing the benefits for the whole open finance ecosystem.

V. Open finance use cases to support trade worldwide

70. Within the open finance landscape, new technologies are enabling the spread of businesses characterized by low marginal costs and innovative use cases. Incumbent and new players have been working to develop services to meet corporate and retail customers' expectations.

A. Account information and payment initiation services

71. In Europe, the PSD 2 gave light to account information services (AIS) and payment initiation services (PIS). According to said piece of legislation, "Member States shall ensure that a payer has the right to make use of payment initiation service provider to obtain payment services".³¹ Similarly, "Member States shall ensure that a payment service user has the right to make use of services enabling access to account information."³²

72. The UK Financial Conduct Authority (FCA) describes AIS as "online services which provide consolidated information on payment accounts held by a payment service user with payment service providers." The same organization refers to a payment initiation service (PIS) as "an online service which assess a user's payment account to initiate a transfer of funds on their behalf with the user's consent and authentication."³³

73. Interestingly, the directive explicitly affirms that both services are applicable only for online payment accounts. The PSD 2 makes it clear that, when dealing with account information service providers (AISPs) and payment initiation service providers (PISPs), account servicing payment service providers (ASPSPs) are required to apply strong customer authentication (SCA) principles to guarantee the security of electronic transactions.

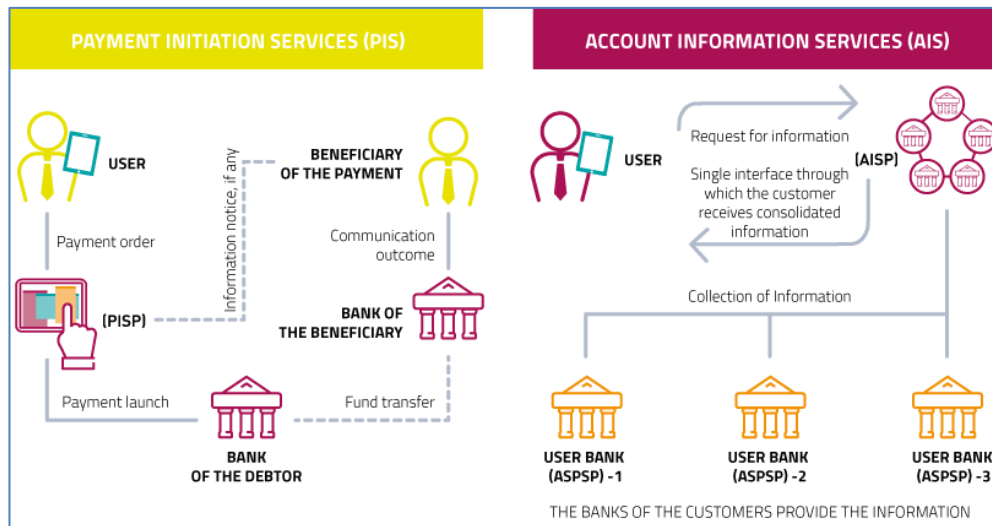
³⁰ Ernest and Young, "Unleashing the potential of FinTech in banking", (EYGM Limited, 2017). Available at https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/banking-and-capital-markets/ey-unleashing-the-potential-of-fin-tech-in-banking.pdf (accessed 16 May 2022).

³¹ Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directive 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC, art 66

³² Ibid, art 67.

³³ FCA, "Account information service (AIS) and payment initiation service (PIS)", (22 September 2017). Available at <https://www.fca.org.uk/account-information-service-ais-payment-initiation-service-pis#:~:text=Under%20PSD2%2C%20a%20'payment%20initiation,credit%20card%20or%20debit%20card> (accessed 16 May 2022).

Figure 3:
Workflow of account information and payment initiation services

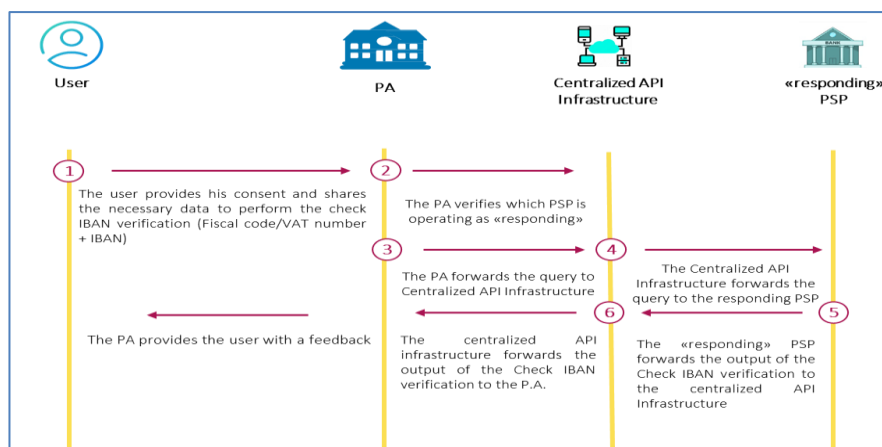


74. Both AIS and PIS can be used to support trade operations on a global scale. On the one hand, PIS can facilitate payment operations, providing a smart option to those economic parties involved in the international supply chain, reducing manual errors and streamlining online transactions. On the other hand, AIS can facilitate trade parties to have an accurate overview of their online banking accounts. This option could be extremely relevant, especially for those multi-banking companies, that refer to different account servicing payment service providers (ASPSPs) to benefit from their banking and financial services.

B. Check IBAN

75. The Check IBAN is a value-added service (VAS), which aims to enhance financial market efficiency as well as finance security. After having received the consent from their customers, PSPs are enabled to offer this service to the public administration (PA) and the private sector. Before authorizing the transfer of values to the account of final user (the latter being either a physical or a legal entity), public governments and corporations are enabled to check in real time the correctness of the association between the IBAN code and the fiscal code or VAT number provided by a final user.

Figure 4:
Workflow of the Check IBAN service for the public administration (PA)



76. When the public administration (PA) asks for Check IBAN verification, banks can only perform the role of responding agent. The PA operates as the calling agent, issuing the Check IBAN request and forwarding it to a centralized API platform that routes the query to the responding PSP. The latter controls whether the IBAN code of the user matches with his/her fiscal code or VAT number. The responding PSP forwards the outcome of its analysis to the centralized API platform, which routes it back to the PA.

77. The second scenario foresees the involvement of corporations in the place of the PA. In this case, bank and non-bank PSPs are enabled to perform both the role of calling and responding agents on behalf of the corporate users. Corporations can request Check IBAN verifications to ensure the correctness of the data provided by customers that are willing to subscribe to a service offered by the concerned corporation.

78. Following the Check IBAN request made by the corporation, the financial intermediary institution (FI) performing the role of calling agent deals with the centralized API infrastructure. The latter routes the request to the PSP operating as responding agent. The responding agent performs the verification and shares the output with the centralized API infrastructure, which routes it back to the calling agent. The latter informs the corporation about the outcome of the Check IBAN analysis.

79. In both workflows, the API gateway covers a pivotal role. By mapping the end points (bank and non-bank PSP) participating in the service, it routes the requests derived from calling entities to responding agents, ensuring a seamless and secure data flow among the parties involved in a Check IBAN transaction. To do so, the API gateway defines common guidelines, technical specifications, and a structured taxonomy that players involved in this data supply chain (being both the public administrations and corporations) must adopt to guarantee the interoperability of the service.

80. In Italy, this functionality was realized by CBI and implemented in July 2020 to support the public administration to correctly deliver fiscal bonuses to people and enterprises affected by the COVID-19 crisis. Until December 2021, the Check IBAN service performed about 7 million checks, thus providing the public administration with a solid anti-fraud and confirmation tool. These figures have been eased by the adoption by the government of a few policies to facilitate the digitalization of payments. These include, for example, the cashback program, which enables consumers to get back a maximum of 10% of expenditures made through online payments and credit/debit cards for transactions up to the limit of 1500 euros. CBI is now proceeding with onboarding operations to enable corporations to take part in the service.

81. Using anti-fraud services, such as the Check IBAN, could facilitate trade operations worldwide. Since trade operators may have a wide range of counterparts, having a functionality that checks in real time the correct association of internationally recognized data (such as the IBAN and the VAT number) could reduce the risks of import and export operations, thus increasing trust in international trade, since payments are addressed to pre-verified and well-known beneficiaries behind the IBAN.

C. Request to pay

82. According to the European Payment Council (EPC), a “request to pay” (RtP) is a “messaging functionality. It is not a payment means or a payment instrument, but a way to request a payment initiation.”³⁴ The RtP covers the set of operating rules and technical

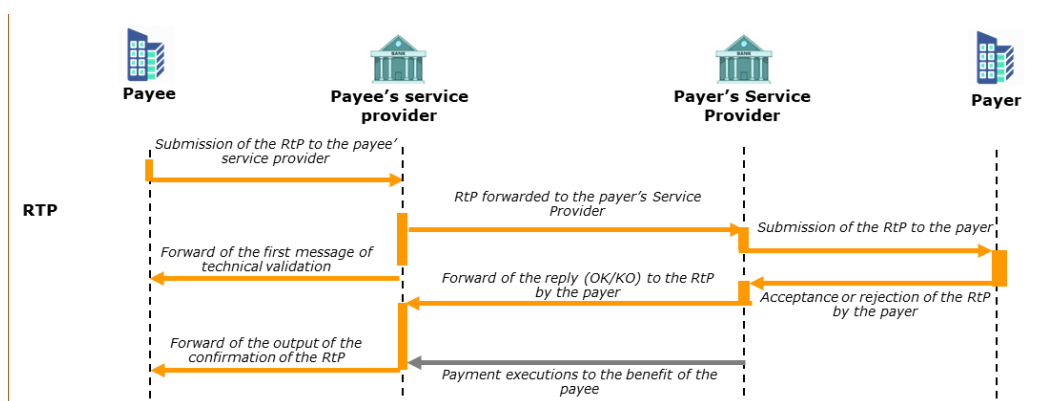
³⁴ European Payments Council, *The SEPA Request-to-Pay (SRTP) Scheme Rulebook*, EPC014-20, version 2.0, (30 November 2021). Available at <https://www.europeanpaymentscouncil.eu/sites/default/files/kb/file/2021-11/EPC014-20%20v2.0%20SEPA%20RTP%20Scheme%20Rulebook.pdf> (accessed 16 May 2022).

elements (including messages) that allow a payee to request the initiation of a payment from a payer in a wide range of physical or online use cases.

83. The scheme of the RtP foresees the involvement of a few actors, namely the payee and the payer and their respective PSPs. The payee submits the RtP. By consulting an API directory, the payee's PSP forwards the request to the PSP of the payer. The latter informs the payers about the RtP. At this stage, the payer decides whether to accept or reject the RtP. Its reply is forwarded by the payer's PSP to the payee's PSP, which informs its customer about the outcome of the request. Interestingly, API are always used in the exchange of financial messages between PSPs.

Figure 5:

The request to pay (RtP) workflow



84. The RtP can be used for person-to-person (P2P), business-to-business (B2B), business-to-government (B2G) or government-to-business (G2B) payments, alongside e-invoice presentment and payment services (EIPP). The scheme of the RtP is intended to be used for both credit transfers and instant credit transfers.

85. The reason for underlining the importance of this aspect of the scheme lies in the possibility of ensuring automatic reconciliations of payments. In doing so, the RtP reduces the possibility of errors derived from manual procedures and increases the speed of payments, thus facilitating payment operations at the international level.

D. The legal entity identifier (LEI)

86. In 2014, the Financial Stability Board (FSB)³⁵ gave light to the Global Legal Entity Identifier Foundation (GLEIF) to uphold the implementation of the ISO 17442 standard - the Legal Entity Identifier (LEI) - worldwide. The LEI code serves to uniquely identify legal entities that are involved in financial transactions. Several regulations around the world impose the use of the LEI to those entities that trade over-the-counter derivatives and securities.

87. Going beyond compliance, the LEI could be used by banks to facilitate know-your-customer (KYC) functionalities. Nowadays, entities obtain a LEI when onboarded by a financial intermediary institution (FI). However, the traditional process for obtaining such a code is to refer to a local operating unit (LOU), namely a federated company of the Global Legal Entity Identifier System (GLEIS), which is an organization entitled to issue LEI codes.

³⁵ The Financial Stability Board (FSB) is an international body that monitors and makes recommendations about the global financial system.

88. When onboarding a legal entity, both FIs and LEI issuers may request that the legal entities provide information related to their legal status and ownership structure. This scenario may entail a duplication of work.

89. In order to streamline the process, the GLEIF has launched a project known as the Validation Agent Network, which allows FIs to perform the role of validation agent. The Validation Agent Network can be described as an “operational model in the global LEI system, which allows FIs to obtain and maintain the LEI for their clients in cooperation with accredited LEI issuer organizations by leveraging their business-as-usual client identification procedures in KYC and client onboarding processes.”³⁶

90. Through this project, FIs may control whether the legal entity wishing to onboard is equipped with a LEI code. If not, the FI checks a series of data related to the legal status and ownership structure of the company. It remains the task of the LOU to issue the LEI in compliance with the ISO 17442 standard.

91. Within the context of LEI issuance, communication between FIs and LOUs can be enabled by APIs, thus streamlining data flows. Besides improving customer experience, this framework enables the digitalization of onboarding processes, which are based on standardized legal entity data. The scheme also allows for enhanced internal data management processes, enabling a reduction of overall costs.

92. The use of the LEI code in trade operations could enhance the quality of data exchange at the international level, besides making KYC and know-your-supplier procedures easier. According to the GLEIF, “all businesses within the supply chain could reduce operational risk by using the LEI of trading partners to reduce the onboarding and maintenance costs of customers and suppliers.”³⁷

E. Trade finance

93. As a part of the project to identify hurdles to achieving complete digitalization of trade transaction documents, and aiming to meet international trade regulations, the dematerialization of documents issued by third parties (other than economic operators interested in the operation) is a priority. In the case of the certificate of origin, used to operate in foreign markets, it is necessary to carry out more complex assessments and consider factors often unrelated to domestic practices. Among the various documents involved in a cross-border transaction, is the bill of lading, which has to be considered both for its qualification as a "document of title" and for its dematerialization.

94. At the fulcrum of payment operations (which tend to guarantee delivery of the goods) are the transport documents. Foremost is the bill of lading, which is important for negotiations regarding the letter of credit.

95. When mentioning, here, the bill of lading (B/L), we are referring exclusively to sea transport, which today represents more than 80 per cent of global transport.

96. The bill of lading is considered, worldwide, as a representative credit title for the transported goods. The bill of lading incorporates the right to return the goods, therefore the

³⁶ GLEIF, “Introducing the LEI Validation Agent Framework. A new role in the Global LEI System enabling financial institutions to simplify and accelerated LEI issuance”, 2020. Available at <https://www.gleif.org/en/lei-solutions/validation-agents/gleif-ebook-introducing-the-lei-validation-agent> (accessed 16 May 2022).

³⁷ GLEIF, *Global Legal Entity Identifier Foundation, Annual Report 2019*, (2020) p. 16. Available at <https://www.gleif.org/en/about/governance/annual-report> (accessed 16 May 2022).

sender of the goods and the recipient could be replaced by “the one that holds the goods”. It is the possession of the title that defines ownership of the related rights.

97. The doctrine has tried to fill this gap by defining the bill of lading document as something representative of a juridically relevant fact. For the sake of clarity, it is also necessary to record contrary opinions based on the fact that the "representativeness" does not come from the document but is the result of a logical operation carried out by the subject who takes the matter into consideration in order to verify their own judgment. So the proof is not in the document, but in the judgment of those who take it as a means of proof.

98. Normally, the term “document” implies the use of paper. The centuries-old use of paper to draw up documents has led to the identification a document as a physical record. It is therefore easy to understand why the concept is associated with paper.

99. The COVID-19 pandemic crisis has significantly expanded the concept of a “document”, underlining that paper can no longer be a requirement to qualify as one.

100. The dematerialization of documents in general is already overwhelmingly underway; however, several problems still exist for the dematerialization or digitalization of the bill of lading.

101. First studies regarding the dematerialization of trade documents go back to 1997. In recent years various IT solutions and platforms have been developed. One of the most well known initiatives is the Digital Container Shipping Association (DCSA) (which was established in early December 2020) the data and process standards for the presentation of the shipping instructions and the issuance of the bill of lading (B/L). DCSA B/L standards are aligned with the UN/CEFACT multimodal transport reference data model to ensure a global industrial framework that accelerates digitalization through unified industry effort. The UNCITRAL Model Law on Electronic Transferable Records also exists, and various countries will be able to use it to make it possible to trade such digital assets. Unfortunately, up until now few countries have taken this path, while others—almost all the European ones—have joined and have shown interest in adopting it, but we still have to wait for the completion of the aforementioned path.

102. The digital acceptance of the bill of lading can only occur if legislators can mandate, with certainty, the confidentiality of the data. This certainty, combined with savings in time and money, could finally lead to the desired digitalization phase of this document, which, in the future, will be the point of reference for transport. The bill of lading is always the *trait-d'union* with the letter of credit instrument.

103. Nowadays, we have to look very carefully at the use of blockchain technology for the management of operations between the various players of the international trade chain, such as shipping, air, customs, port authorities and others.

104. The financial part of the operation will also have to be integrated with the banking system, which will have to be a leading actor for the definitive development of a new era.

105. Among a few others, the first document to be made fully digital native and not only "dematerialized" (as digitally scanned document), is the bill of lading.

106. Unfortunately, to date, the biggest obstacle to the digitalisation of the B/L is the lack of a single central storage point for control keys or other tools that can allow the transfer of the bill of lading using a cryptographic key as opposed to handling a paper document. Additionally, it will be necessary to intervene to align the various national law regulations in order to change the current stance and push for global adoption of MLTER for the transfer of digital documents (whilst B/L for instance can be exchanged today only through means of paper endorsement).

107. The International Chamber of Commerce is working on achieving full digitalization of documents, and hopefully there will soon be a unique operational and legal framework to work within.

F. Buy now, pay later

108. Open banking access to account interfaces already supports payment initiation services, which are compulsory services in Europe under the PSD 2 for different types of payments including bulk payments and SEPA credit transfers. However, the growth of e-commerce and online digital payments is driving the market to ask for more flexible payment options.

109. Therefore, FIs are developing a new operational model called “buy now, pay later” (BNPL), in which a buyer can ask their ASPSP or another PSP for a micro-loan as a part of a full payment. In a business-to-customer (B2C) scenario, the ASPSP can grant an immediate loan to its payment service user (PSU), defining with the client a repayment schedule based on defined competitive conditions (e.g. interest rate, frequency of the rate, the length of the financing plan, etc.). This type of functionality could be further incentivized by the use of APIs, which allow for the real-time sharing of loan conditions and authorizations between the ASPSP and the final user, thus improving the user experience of customers and merchants.

110. The buy now, pay later model can support users who are looking for a loan for their purchases and enable them to pay in instalments directly through their bank account, and without a credit card. The service also has important consequences for merchants and customers (both online and physical) in terms of churn and conversion rates. Users are more inclined to making certain purchases without credit cards or liquidity on their accounts. Of course, this service could also affect—both in negative and positive way—the spending power of final users, who must utilize this service carefully in order to avoid exceeding their solvency capacity. Credit worthiness checks may be performed by service providers offering this functionality, even via API, thanks to the informative flows exchanged through third parties (e.g. info provider, credit scoring agencies, etc.) whose predictive ratings are improved thanks to open banking functionalities (e.g. checks on transaction lists). The more the user is “trusted” through algorithms which indicate their solvency history, the more they can spend thanks to higher spending limits.

111. Overall, buy now, pay later functionality may be used by PSPs as a short-term financing option to facilitate payment operations within the supply chain. It could support SMEs that lack the funds to face international competition and do their business beyond national borders.

G. Public administration certificates

112. The Organisation for Economic Co-operation and Development (OECD) defines open government as the opening up of government processes, proceedings, documents, and data to public scrutiny and involvement.³⁸ Therefore, the expression open (government) data refers to the information collected, produced, or paid for by public bodies which is made freely available for reuse for any purpose.

113. Open data enables cross-sector data sharing, which has various advantages. It allows the public sector to benefit from accurate spending reviews to avoid unnecessary costs and

³⁸ OECD, *Open Government: The Global Context and the Way Forward*, (OECD Publishing, Paris: 8 December 2016). Available at <https://doi.org/10.1787/9789264268104-en>.

to enhance efficiency and transparency. On the other hand, open data incentivizes the private sector to come up with innovative services and business models, thanks to the large set of available information (including the habits and behaviours of citizens in the domain of public administration services).

114. The public administration must play a pivotal role if the benefits of the application of open data are to be realized. For example, governments could provide final users with the main documents related to their personal information, such as registry certificates, through a digital interface. In doing so, they can cooperate with the private sector. Certificates, personal data, and health attestations could be requested of the government by a final user through their own internet banking or payment application, enabling new use cases together with cross-selling opportunities. These types of opportunities are even more feasible nowadays with the application of advanced technologies (e.g. API and cloud computing) and the establishment of the open banking paradigm on a global scale. Therefore, the public administration could become a pioneering data-sharing agent capable of providing citizens with relevant information, thus improving the efficiency of public and private processes.

H. Instant insurance services

115. The insurance sector is undergoing a major transformation, as players are evolving their offerings to meet new customer needs, prioritize their investments in digital and instant services and rationalize costs.

116. To do so, insurance companies are promoting innovation by partnering with other players, including technology providers and insurtech companies. This shift is due to the establishment of innovative economic paradigms, including open finance and open data, in which data is considered the new fuel for economic growth, improving risk management activities, and designing innovative services.

117. The internet of things (IoT) and 5G technologies are two elements supporting the spread of innovative insurance functionalities in the market. IoT is allowing insurance companies to offer pay-per-use agreements for end user vehicles.

118. Open banking allows insurance companies to benefit from the opportunities afforded by using financial data to improve risk evaluation and to discover business opportunities. Technologies such as APIs allow for the smooth and easy integration of insurance services into banking and financial applications, enabling both an improvement in FI supply and user experience.

119. Against this background, insurance players have been working to deliver cutting-edge products, including instant insurance and micro-insurance. These products allow companies to respond to their customers' needs in the precise moment in which the need arises and for the limited period of time related to the client's needs. These economic models are particularly effective as they perfectly adapt to the changing needs and habits of consumers, including the increasing propensity for instant and modular products and services that do not tie them to a particular provider, but give them the freedom to choose from a variety of suppliers.

120. Transitioning to open insurance by allowing consumers to share their data with third parties will foster data mobility and the growth of platform ecosystems. Thus, incumbents will be able to tap into new technologies, experiment, and upgrade processes to match consumer expectations. While open banking has taken centre stage at regulatory level, global industry-led initiatives³⁹ are working to formulate common data standards and open API specifications. However, it is interesting to note the increasing interest by regulators. The

³⁹ An example is the Open Insurance Initiative.

Financial Conduct Authority (FCA)⁴⁰ and the European Insurance and Occupational Pension Authority (EIOPA)⁴¹ have both released public consultations to explore the opportunities for extending open banking frameworks.

121. These new proposals represent a potential win-win solution for insurance companies and policyholder. One benefit is the opportunity to identify a reduction in the timing associated with the underwriting phase and an increase in the level of transparency. All the benefits depend upon the capability of insurance companies to adapt their models to the new technological trends. Rapid answers can only be effectively obtained with the right tech management. This is why, over the last two years, several insurance companies have started to make significant IT infrastructure changes, even signing strategic partnerships with key tech players.

I. Risk rating service

122. Today, risk management and other activities related to analytics play a pivotal role within the open finance landscape. Final users and third parties can benefit from the exchange of dispositive and informative data with FIs. Different TPPs operate as information providers, with the goal of enhancing credit scoring tools and software to take full advantage of the potential of open banking.

123. In the PSD 2 scenario, after having obtained consent from the final user, TPPs can access payment data related to transaction lists, account owners, account lists, and disposable incomes. This type of information could be very useful in defining the credit score of the consumer. Moreover, recurring consent, given by the final user, can allow third parties to periodically access relevant information to perform predictive analyses.

124. Personal financial management (PFM) and business financial management (BFM) functionalities are offered by many third parties that have never directly offered financial services before. These information providers are entering into the open finance market with personalized financial tools to offer innovative services to their clients (including, digital identity services and wallets) and to improve their understanding of their customers' spending habits.

125. Information providers are among the players benefitting the most from the open banking scenario, thanks to the opportunity to perform real-time checks into final user credit scores using APIs. By virtue of advanced technologies, these kinds of checks can be easily integrated as micro-services into more complex and structured products, such as buy now, pay later schemes.

J. Securitization

126. When we talk about securitization, we are unfortunately led to think about the year 2008, which was not a happy one for this form of financing, and which was equally critical for the world of banking and economics. Not by chance, this was the same year in which Satoshi Nakamoto's white paper was published and the blockchain project came to life.

127. The challenge for those working on digital innovation in the financial world is to overcome deep-rooted prejudices by leveraging trust, which is the cornerstone of any economic and financial transaction. When it comes to building and guaranteeing trust, it is

⁴⁰ FCA, "FCA publishes feedback to Call for Input on open finance", (26 March 2021). Available at <https://www.fca.org.uk/news/news-stories/fca-publishes-feedback-call-input-open-finance> (accessed 16 May 2022).

⁴¹ EIOPA consults on open insurance.

once again no coincidence that it is the blockchain that can open up new perspectives and new models. These considerations have given rise to platforms that allow access to this form of financing (even for those who have never considered). These platforms increase the effectiveness of financial services and simplify the means of access to credit while increasing reliability, transparency and security.

128. The two basic challenges of securitization are:

- the operational difficulties; and
- the need to meet the transparency requirements demanded by both investors and regulators, to protect the market.

129. The most interesting models for this market are those of the end-to-end platforms, i.e., those that follow the process from the origin, through

- management of the original asset (e.g., invoices issued to the public administration);
- onboarding managed with digital and regulated KYC and anti-money laundering processes for assets in portfolios;
- conversion and transformation into tokens; and
- provision of information on the tokenized asset and its performance.

130. In this way, both the invoices and the bonds are collateral and will have their own digital representation on the blockchain.

131. When transferring ownership using an ad hoc procedure of issuing securities, a security token can also be associated and paired "one-to-one" with the original asset, represented by the set of issued invoices. This token facilitates trading and settlement and allows the asset to be placed on the market, thus allowing its value to be exploited.

132. The blockchain, with its notarization feature, allows for accurate, real-time reporting on what is happening, which also addresses the issue of transparency.

133. New models that this technology enables can provide all the guarantees on the performance of the asset's life cycle, a workflow that simplifies securitization operations based on the provision of collateral, and can make data available to the market to attract new funding.

134. Another important feature is compliance regarding the identity of subjects; the blockchain provides certainty of the identity of each actor, thus providing trust in the subjects that operate within it. It also confirms compliance with the necessary features of digital trust services, which in Europe have been introduced through the eIDAS Regulation.

135. The market also needs transactions that are as real-time as possible, not only for the confidentiality of the information exchanged, but also to ensure that transactions do not run the risk of suffering denial-of-service (DoS) attacks.

136. In concrete terms, the blockchain is a technology on which to record performance data and assets and their management, including their transfer. In fact, the blockchain makes it possible to considerably reduce the operations of intermediaries and to facilitate the exchange of asset ownership. With blockchains, one can innovate the industry by making services available for token exchange, even if the company does not issue a public securitization, and this favours SMEs.

137. Providing detailed tracking of the performance of the underlying assets, and a real-time view of the history of the performance generated by the assets would increase investor awareness because they would be able to see the history of the value of the underlying assets. Before the technology available today existed, this was not possible.

138. All this is only possible if products and solutions are made available that provide virtual desks with all the data related to the securitized assets, as well as the integration of this data with different systems tracking the performance of the assets. Only in this way can securitization be a powerful technological tool to serve the real economy by drastically reducing the time it takes to access liquidity.

139. Blockchain technology and the solutions described above can also make it possible to deal with the next wave of NPLs (non-performing loans) by exploiting the potential of other technologies such as cloud storage and artificial intelligence to digitalize the entire process of negotiating and selling non-performing loans (also as part of securitization operations). This would give a boost to the standardization of processes, thus encouraging the creation of a transparent, liquid and efficient secondary credit market. Thanks to a system of smart contracts, credit can be tokenized and transferred easily and quickly. Each credit can have a permanent data room in which all the related data and documents are stored, which will have an incorruptible date stamp thanks to blockchain technology.

VI. Conclusions: suggestion for policymakers and decision makers

140. Far from being a comprehensive analysis on open banking and open finance, this white paper has aimed to highlight the main characteristics of these innovative paradigms and shed light on a few use cases that could support trade on a global scale. The services investigated in this document have focused on the payments sector, which is crucial for completing of trade-related operations.

141. Therefore, policymakers and decision makers are urged to take into account the evolution characterizing this domain, and more generally the financial services market.

142. Open finance services provide added value as they are able to gather data belonging to different industries, thus enriching the overall level of information to be displayed throughout the supply chain. This aspect increases the quality of data and reduces human errors. Furthermore, advanced technologies increase the speed of services, as they can be performed on a real-time basis. This improves the customer and user experience, facilitating payments all along the supply chain and reducing the time necessary for each operation. Data sharing is the key to delivery of new services, but privacy constraints and the risk of cyber security must be seriously taken into account by all the service providers, to protect the customers that access these new experiences.

143. Against this background, the activities performed by national and international legislators and standards-setting bodies are of paramount importance in enhancing the degree of interoperability of these services at the global level. To this end, the UN/CEFACT Finance and Payment Domain suggests that legislators and policymakers ensure the application of the level playing field principle, for which the same activities and risks are addressed by the same rules. This scenario would also lead to non-financial players (e.g. Telcos, public administrations, automotive, pharmaceutical companies) being interested in taking part in the payments sector to share data, thus incentivizing a paradigm shift from open finance to open data. Finally, by supporting the uptake of open finance services, policymakers and decision makers could boost trade facilitation and electronic business, contributing to the development of a solid and safe digital economy.