KONKURRENSVERKET
Swedish Competition Authority

The platformization of banking in Sweden

– towards an open banking ecosystem

Osama Mansour på uppdrag av Konkurrensverket

UPPDRAGSFORSKNINGSRAPPORT 2025:4

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Förord

I Konkurrensverkets uppdrag ingår att främja forskning på konkurrens- och upphandlingsområdena. En del av det arbetet genomförs genom uppdragsforskning; forskning som genomförs på vårt uppdrag för att belysa eller undersöka en viss fråga inom våra ansvarsområden.

Inom banksektorn är öppna banktjänster, så kallad open banking, under framväxt. Öppna banktjänster innebär att kunder ger bankerna tillåtelse att dela deras data till tredjepartsleverantörer, vilket kan bidra till mer innovation och utveckling av nya produkter.

Öppna banktjänster har förändrat landskapet på marknaden och skapat plattformar där banker och leverantörer möts. När aktörerna samarbetar och nätverkar med varandra finns det risk att det påverkar konkurrensen. Därför är det viktigt att följa upp utvecklingen av plattformarna för att säkerställa en väl fungerande konkurrens inom banksektorn.

På uppdrag av Konkurrensverket har docent Osama Mansour vid Lunds universitet kartlagt och analyserat öppna banktjänster i den svenska banksektorn, med fokus på marknadsinträde och inträdesbarriärer.

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Författaren ansvarar själv för bedömningarna och slutsatserna i rapporten.

Stockholm, juli 2025

Marie Östman
Generaldirektör

Innehåll

Key Concepts

Key concept	Definition
Open banking	A platform approach to banking in which banks act as platform owners and offer resources such as APIs to provide access to customer banking data for external, autonomous third-party complementors and facilitate generative development of customer-centered payment service innovations.
Third-party providers (TPPs)	Major external actors in the open banking ecosystem acting as autonomous complementors[1] through engaging with platform owners and developing complements such as digital applications and services using platform resources to co-create value and extend the scope of financial service innovations. Examples of TPPs are Fintechs such as Account Information Service Providers (AISPs) and Payment Initiation Service Providers (PISPs).
Digital Platform	Digital platforms as a set of digital resources—including services and content—that enable value-creating interactions between external producers and consumers.[2]
Payment Services Directive (PSD2)	An EU directive (2015/2366), and an umbrella legal framework for open banking, that regulates two main types of payment services including payment initiation services and account information services.
Framework for Data Access (FiDA)	An EU proposal for open finance which is wider in scope than open banking as it regulates broader access to data which includes savings, pensions, insurances, and investments through standardized and secure services.
Digital Ecosystem	An aggregate of developers of complementary products required to extend the value of a core platform technology.[3]
Payment Initiation Service	A service to initiate a payment order at the request of the Payment Service User (PSU) with respect to a payment account held at another payment service provider.[4]
Account Information Service	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.[5]
Application Program Interfaces (APIs)	Small pieces of software that used as digital interfaces that facilitate information inputs and outputs at multiple sides of the platform.
Fintech(s)	Fintech(s) which is short of financial technology refer to companies that rely primarily on technology to conduct fundamental functions provided by financial services affecting how customers store, save, borrow, invest, move, pay and protect money. Fintechs can be startups, banks, non-bank entities, neo banks, and cross-sector firms.
Platform Competition	A type of rivalry where two or more organizations strive to fulfill their (partially) nonshareable goals by participating in platform interactions and where such interactions will reduce the value gained directly or indirectly by other parties from such interactions.[6]
Platformization	Platformization is a strategy for operating multi-sided platforms and connecting buyers and sellers without controlling or owning the products or services that are being sold.[7]

[1] Complementors and TPPs are used interchangeably in the report.

[2] Constantinides et al. (2018); de Reuver et al. (2018).

[3] Jacobides et al (2024).

[4] Directive 2015/2366

[5] Directive 2015/2366.

[6] Grover & Lyytinen (2022).

[7] Zhao et al. (2020); Constantinides (2018).

Sammanfattning

Banksektorn genomgår en betydande förändring, vilket inte minst blir tydligt i det reviderade betaltjänstdirektivet (PSD2) som är en omfattande utveckling av gällande regelverk och som potentiellt kommer att driva på grundläggande förändringar på betalmarknaden. PSD2 möjliggör bland annat bättre datatillgång för nya tredjepartsleverantörer (TPP) som inte är banker, och detta skiljer sig åt mot den tidigare situationen där datatillgången dominerades av stora väletablerade banker. Detta medför att ett större antal flexibla tredjepartsleverantörer har en större möjlighet att utveckla nya produkter och verka på marknaden. PSD2 erbjuder i grunden ett rättsligt ramverk för övergången från produktbaserad bankverksamhet till en plattformbaserad utveckling av komplementära varor och tjänster på bankmarknaden. Denna framväxt av öppna banktjänster skapar således ett helt nytt bankekosystem där banker, tillsammans med ett heterogent nätverk av tredjepartsleverantörer, deltar i utvecklingen av finansiella tjänsteinnovationer.

Den tekniska implementeringen av PSD2 har dock medfört ett antal utmaningar. Främst handlar det om att banker måste utveckla dedikerade gränssnitt (gränssnitt för applikationsprogram – API), vilka tidigare har betraktas av bankerna som belastande snarare än en möjlighet, särskilt i avsaknad av direkt ersättning. Kvaliteten på existerande API:er som primära dataåtkomstkanaler är problematisk för tredjepartsleverantörer som ofta klagar på att bankerna endast tillhandahåller minimal funktionalitet. Detta i sin tur kan skapa hinder för effektiv tjänsteutveckling och konkurrensutsatta tjänsteerbjudanden.

Bankernas synsätt i frågan om öppna banktjänster har dock förändrats över tid och många banker har reviderat sina tidigare förhållningssätt och ser nu öppna banktjänster som en möjlighet för innovation och att kunna erbjuda fler tjänster till sina kunder. Detta skifte hänger ihop med insikten att banker också kan vara dataanvändare, inte bara leverantörer, vilket gör det möjligt för dem att erbjuda mer omfattande tjänster genom partnerskap med tredjepartsleverantörer och serviceintegration inom bankernas kärnplattformar och kanaler. Tredjepartsleverantörer som initialt positionerade sig i direkt konkurrens med bankerna har samtidigt insett att denna strategi det kan bli både kostsam och ohållbar och att deras fokus bör ligga på att etablera partnerskap med etablerade aktörer. Denna utvecklande dynamik återspeglar ett mer pragmatiskt förhållningssätt inom det öppna banklandskapet, där både samarbete och konkurrens kan samexistera.

PSD2 har förändrat marknadsdynamiken för inträde, vilket gör det möjligt för såväl banker som tredjepartsleverantörer att satsa på nya områden där de kan konkurrera med varandra. Rätten till dataåtkomst har gjort det enklare för tredjepartsleverantörer att utveckla mervärdestjänster och förbättrade kundupplevelser som i sin tur reducerar hinder för användning av oreglerade metoder och underlättar marknadsinträde. Banker har också möjligheter att agera tredjepartsleverantörer genom att få tillgång till data från andra banker. Det innebär att de kan erbjuda omfattande

tjänster till sina egna kunder. Marknadsinträdet möjliggör utvecklingen av plattformsbaserade affärsmodeller, vilket blir ett tillfälle för både banker och tredjepartsleverantörer att delta i ömsesidigt värdeskapande och dra nytta av ”network effects”. Ett ökat fokus på data har lett till framväxten av dataaggregatorer och mellanhandstjänster, som tillhandahåller plattformar som i sin tur kopplar ihop tredjepartsleverantörer med bankernas API:er och förenklar processen att få åtkomst till data över flera plattformar. Dataaggregatorer berikar den öppna bankmarknaden med nya tjänster som Compliance-as-a-Service, Platform-as-a-Service, API-as-a-Service och Data-as-a-Service. Det möjliggör att olika stora tredjepartsleverantörer drar nytta av stordriftsfördelar och utveckla tjänster på olika marknader.

Den ökande tonvikten på teknologisk innovation utgör en av PSD2:s transformativa effekter och markerar ett skifte i en traditionellt konservativ banksektor där teknologi tidigare hade framför allt en stödjande roll. Teknologins roll syns numera i form av konkurrensfördelar, innovation och ekosystemtillväxt och är därför en primär drivkraft för bankernas plattformsutveckling. Det finns en teknologisk klyfta mellan traditionella banker och Fintech-företag, vilket har skapat möjligheter för nya aktörer att implementera nischade digitala tjänstestrategier och teknologisk differentiering. Dataåtkomst enligt PSD2 medför ökat fokus på att utveckla avancerad teknik och att använda AI för att erbjuda kunder nya, personliga och säkra finansiella upplevelser. Kunskap om avancerad teknik och AI är en nödvändighet för marknadskonkurrens och partnerskap inom banksektorn och möjliggör långsiktiga innovationer på marknaden och framväxten av ett öppet bankekosystem som är mer inkluderande. Såväl banker som tredjepartsleverantörer kan spela avgörande roller genom att positionera sig som de aktörer som genomför datautbyten, aktörsinteraktioner och tjänsteinnovationer.

Ekosystemets utveckling kräver dock att de hinder som tredjepartsleverantörer möter minskar eller försvinner, eftersom dessa försvårar hur dessa aktörer aktivt kan delta på marknaden. Licenskrav och andra regulatoriska svårigheter utgör inträdeshinder, dels på grund av bristande tillsyn, dels på grund av den belastning som läggs på tredjepartsleverantörer att själva säkerställa korrekt licensiering. API-agnosticism och bristen på flera dataåtkomstkanaler förstärker beroendet av bankerna och deras dominans, vilket upprätthåller maktobalanser och resulterar i en ojämn spelplan. Trots den förändrade inställningen till öppna banktjänster förblir bankerna ambivalenta och antar ofta minimala efterlevnadsstrategier som prioriterar efterföljandet av regulatoriska krav snarare än innovation. Detta sker till följd av de höga kostnaderna för teknologisk utveckling och bristen på ersättningssystem. Tredjepartsleverantörer möter också skepsis från kunder som inte är bekanta med öppna banktjänster. Detta i sin tur påverkar deras förmåga att bygga förtroende och utöka sin kundbas, särskilt på grund av bristen på central eller koordinerad samordning och plattformar.

Framtiden för öppna banktjänster fortsätter bortom PSD2:s nuvarande utbredning. Kommande PSD3 och andra regleringar för öppen finans, såsom FiDA, förväntas tackla vissa begränsningar, potentiellt genom att inkludera ersättning för API-

användning och större åtkomst till finansiell data. Multilaterala system är avgörande för att etablera ramverk för dataåtkomst bortom regulatoriska krav, med målet att skapa mer samarbetsinriktade och effektiva sätt för banker och tredjepartsleverantörer att arbeta på. När ekosystemet mognar kan vi förvänta oss mer välutvecklade tjänster, djupare integration mellan olika aktörer och i slutändan bättre finansiella tjänster för både konsumenter och företag. Avgörande för en fortsatt välfungerande utveckling inom öppna banktjänster och öppen finans kommer att vara fortsatt regulatoriskt stöd, förbättrade tekniska standarder och vilja från alla parter att samarbeta för att skapa ett mer öppet och innovativt finansiellt ekosystem.

Summary

The banking industry is undergoing a major transformation. The revised Payment Services Directive (PSD2) is a significant regulatory development that is prompting fundamental changes in the payment market. The mandated access to data by new, non-bank third-party providers (TPPs) is opening the market - once monopolized by large, incumbent banks - to numerous agile TPPs. PSD2 provides a legal framework for the transition from product-based banking into platform-based development of complementary products and services. The rise of open banking promises new economies of complementarities, where banks, together with a heterogeneous network of third-party providers engage in the development of financial service innovations that enable the emergence of a new open banking ecosystem.

The technical implementation of PSD2 has presented numerous challenges. Banks are required to develop dedicated interfaces, initially viewing this as a compliance burden rather than an opportunity particularly in the absence of direct compensation. The quality of APIs as primary data access channels remains a persistent issue, with TPPs often complaining that banks provide only minimal functionality, creating obstacles to effective service development and competitive service offerings. However, banks' perspectives have evolved over time. Many have matured in their approach, recognizing open banking as an opportunity for innovation and customer retention. This shift stems from the realization that banks can also be data users, not just providers, allowing them to offer more comprehensive services through partnerships with TPPs and service integration within banks' core platforms and channels. Similarly, TPPs recognize that competing directly with banks, as they initially positioned themselves, can be both costly and unsustainable, and instead the focus should be on establishing partnerships with the incumbents to attract customers and gain their trust. This evolving dynamic reflects a more pragmatic approach in the open banking landscape, where competition and partnership can coexist together.

PSD2 transformed market entry dynamics allowing both banks and TPPs to engage in novel areas of competition. The right to access made it easier for TPPs to develop value-added services and enhanced customer experiences, overcoming obstacles associated with using unregulated methods and facilitating market entry. Banks also have opportunities to act as TPPs by obtaining access to data from other banks allowing them to offer comprehensive services to their own customers. These market entry opportunities enable the development of platform business models allowing both banks and TPPs to engage directly in mutual value creation and leverage network externalities. The increased focus on data enabled the emergence of data aggregators and intermediaries, providing platforms that connect TPPs with banks' APIs, simplifying the process of accessing data across multiple platforms. Data aggregators enrich the open banking market with novel services such as Compliance-as-a-Service, Platform-as-a-Service, API-as-a-Service, and Data-as-a-Service, allowing TPPs of different sizes to benefit from economies of scale and develop services across different markets.

The growing emphasis on technological innovation stands out as one of PSD2's transformative impacts, signaling a shift in a traditionally conservative banking industry where technology once played only a supporting role. It has now become the driving force behind competitive advantage, innovation, and ecosystem growth. Technology is therefore a primary driver for the platformization of banking. There is a technological gap between traditional banks and agile Fintechs that created opportunities for new entrants to implement niche digital service market strategies and technical differentiation. Data access under PSD2 is driving increased focus on developing advanced technologies and using AI to offer customers new personalized and secure financial experiences. This in turn makes technological prowess a necessity for market competition and partnership in the banking industry. These developments are enabling the emergence of an open banking ecosystem, which is more inclusive and allows for sustainable innovations in the market. Banks and TPPs alike can play crucial roles, positioning themselves as orchestrators of data exchanges, actor interactions, and service innovations.

The evolution of the ecosystem, however, requires overcoming barriers facing TPPs and hindering their effective participation in the market. Licensing requirements and regulatory complexities are barriers for market entry, because of lack of enforcement and the burden placed on TPPs to obtain proper licensing. API agnosticism and the lack of multiple data access channels reinforce dependence on banks and their dominance, sustaining power imbalances and resulting in an uneven playing field. Despite the changing mindset toward open banking, banks remain ambivalent, often adopting bare-bone compliance strategies that prioritize regulatory satisfaction due to high-cost for technology development and the lack of compensation schemes. TPPs also face skepticism from customers unfamiliar with open banking services, which affects their ability to build trust and grow their customer base, particularly due to the lack of central or coordinated orchestration and platforms.

The future of open banking extends beyond the current scope of PSD2. Upcoming PSD3 and open finance regulations such as FiDA are expected to address some limitations, potentially including compensation for API usage and broader access to financial data. Multilateral schemes are essential to establish frameworks for data access beyond regulatory requirements, aiming to create more collaborative and efficient ways for banks and TPPs to work together. As the ecosystem matures, we can expect more sophisticated services, that will deeper integration between different players, and ultimately better financial services for customers and businesses. The possibility to reach future successful development within open banking and open finance will depend on continued regulatory support, improved technical standards, and willingness from all parties to collaborate in creating a more open and innovative financial ecosystem.

1 Introduction

Digital platforms have become dominant forms of organizing in the digital age.[8] The giants of the tech industry or big tech companies such as Facebook, Amazon, Apple, and Google are pioneers in the application of platform business models. Nowadays, many industries such as banking, entertainment, and oil production are itching towards developing digital platforms. The application of digital platforms in organizations is enabling the emergence of ecosystems of heterogenous actors, infrastructures, and data[9] resulting in new economics of complementarities[10] and network effects[11]. These developments represent a process of platformization, which is a strategy for operating multisided platforms and connecting buyers and sellers without controlling and selling which products are being sold. Digital platforms are the technological building blocks of ecosystems. They are defined as extensible codebases consisting of a set of digital resources that enable generative value co-creating interactions among multiple actors including platform owners, customers, and external third party complementors.[12] The shift into platform business models or platform thinking[13] represents a transition from traditional product-based to platform-based competition which is entirely contingent on attracting complementors to contribute into the growth of platforms through generative development of data based product and service innovations[14].

The banking industry has long been using so-called transaction platforms[15] that are limited to enabling a basic exchange of data between banks and their customers. As financial institutions operating in a highly regulated environment, banks kept their stringency as guardians of data. Interestingly, regulation aimed at customer security and data protection in the banking industry is often seen as mutually incompatible for customer payment innovation. Regulators within the European Union (EU) observe that the banking industry has largely been functioning under monopolistic conditions[16] and not doing enough to develop payment innovations in the retail

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[8] Gawer, A., 2022. Digital platforms and ecosystems: remarks on the dominant organizational forms of the digital age. *Innovation* (24:1), pp.110-124.

[9] Bonina, C. and Eaton, B., 2020. Cultivating open government data platform ecosystems through governance: Lessons from Buenos Aires, Mexico City and Montevideo. *Government Information Quarterly*, (37:3), p.101479.

[10] See Gawer (2022) discussion on digital platforms as dominants forms of organizing.

[11] Constantinides, P., Henfridsson, O. and Parker, G. 2018. Platforms and Infrastructures in the Digital Age, *Information Systems Research* (29:2), pp. 1-20.

[12] Ghazawneh, A. and Henfridsson, O., 2013. Balancing platform control and external contribution in third-party development: the boundary resources model. *Information Systems Journal* (23:2).

[13] Grover, V., and Lyytinen, K., 2022. Special Issue Editorial: Platform Competition in the Digital Era - Overview and Research Directions, MIS Quarterly Executive, 21(1); Cennamo, C., 2021. Competing in digital markets: A platform-based perspective. Academy of Management Perspectives, 35(2), pp.265-291.

[14] Staub, N., Haki, K., Aier, S. and Winter, R. 2022. Governance mechanisms in digital platform ecosystems: addressing the generativity-control tension. *Communications of the Association for Information Systems* (51:1), p.43.

[15] Gawer (2022).

[16] Ozcan, P. and Zachariadis, M. 2021. *Open banking as a catalyst for industry transformation: Lessons learned from implementing PSD2 in Europe.*

market that occupy a quarter of total banking revenues[17]. These issues are seen as regional problems for competition and opening up the banking industry to new players (non-bank third parties) to pressure older, traditional banks that dominate the market to do more for the customers.[18]

The recent enactment of the revised Payment Service Directive so-called (PSD2) by the EU is a response to these issues that serves as a catalyst to shake the stagnant innovation environment and create novel competitive conditions for a new financial ecosystem with innovation platforms at its heart. PSD2 is an EU directive that mandates banks to provide secure access to customer banking data (e.g., customer account information, payment initiation) by external non-bank third party providers (TPPs).[19] Customer ownership of banking data and transactions is a core principle in PSD2 that empowers them to control their data.[20] To comply with PSD2, banks have to provide open, but secure, access to customer banking data to licensed TPPs identified in the directive as Account Information Service Providers (AISPs) and Payment Initiation Service Providers (PISPs). Banks often do this in digital platforms where they offer boundary resources[21] in the form of Application Program Interfaces (APIs), or open APIs, which act as a digital interface between the bank as a platform owner and external TPPs. APIs are small pieces of software that facilitate information inputs and outputs at multiple sides of the platform. The phenomenon of providing access to licensed TPPs via APIs by banks is coined open banking.[22] APIs are deemed by banks as a reliable and tested technology to facilitate secure access to Payment Service Users' (PSUs) accounts.[23] Some observers also refer to it as the "API economy" since APIs play a central and quite transformative role in facilitating access to data and developing payment service innovations.[24]

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[17] Cortet, M., Rijks, T. and Nijland, S. 2016. PSD2: The digital transformation accelerator for banks, *Journal of Payments Strategy and Systems* (10:1), pp.13-27.

[18] Ozcan & Zachariadis (2021).

[19] Gounari, M., Stergiopoulos, G., Pipyros, K. and Gritzalis, D., 2024. Harmonizing open banking in the European Union: an analysis of PSD2 compliance and interrelation with cybersecurity frameworks and standards. *International Cybersecurity Law Review*, 5(1), pp.79-120; Berber, L., Atabey, A., 2021. Open banking & banking-as-a-service (BaaS): a delicate turnout for the banking sector. *Global privacy law review*, 2(1), pp.59-82; Radanović, I., 2024. Contemporary data sharing models: open banking and open finance.

[20] Mansour & Ghazawneh (2023); He et al. (2023).

[21] Ghazawneh & Henfridsson (2013).

[22] Schreieck, M., Huang, Y., Kupfer, A. and Krcmar, H., 2024. The effect of digital platform strategies on firm value in the banking industry. Journal of Management Information Systems, 41(2), pp.394-421.; Gounari et al. (2024); Radanović (2024); Berber & Atabey (2021).

[23] Berber & Atabey (2021).

[24] Gounari et al. (2024); Radanović (2024).

The emergence of open banking represents a radical change in regulating the financial payment market and a shift into a data-driven banking ecosystem.[25] The implementation of open APIs in the context of open banking is a major transformation in the banking industry.[26] Primarily, the traditional role of banks as guardians of banking data is transforming into orchestrators of generative value co-creating activities among customers, developers, and complementors.[27] Banks have no longer exclusive control of banking data[28] and more actors, especially non-bank entities such as Fintechs and other financial startups, have a legal right to access the data via APIs and develop payment service innovations. So, banks are "losing" a degree of control which they have enjoyed since the establishment of the banking system, and their status as "trusted agents" is challenged by new players in the emerging ecosystem of banking.[29] The transformation also involves changing banking practices because customers have decision rights on how actors in the open banking ecosystem can access and use their data.[30] For instance, customers have the ability to directly interact with TPPs without any involvement by banks (e.g., Swedish customers using BankID to authorize Klarna to access their bank accounts and make payments). PSD2 as the legal foundation of open banking, thus, lowers the barriers for non-bank TTPs to enter the banking industry without the need for prohibitive investments.[31] As orchestrators, banks develop and offer APIs to encourage generativity and cultivate platform ecosystems through third-party development by TPPs and other external complementors.[32] This generative environment is then conducive to the development of diverse payment service innovations allowing customers to enjoy improved banking experiences. For banks and other complementors, it is a new arena for competition in creating new revenue streams (e.g., monetizing APIs, integration with customer corporate systems) as well as develop a new service model in the banking industry. In other words, the vision of open banking is to create an ecosystem of payment service innovations similar to mobile application marketplaces such as iOS and Android where multiple actors use platform resources (open APIs) and engage in generative activities for

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[25] Gounari et al. (2024); He, Z., Huang, J. and Zhou, J. 2023. Open banking: Credit market competition when borrowers own the data. *Journal of financial economics* (147:2), pp. 449-474.

[26] Gozman, D., Hedman, J. and Sylvest, K., 2018. Open banking: Emergent roles, risks & opportunities. In 26th *European Conference on Information Systems*. Association for Information Systems. AIS Electronic Library; Brodsky, L. and Oakes, L. 2017. Data sharing and open banking, *McKinsey & Company*.

[27] Mansour, O. and Ghazawneh, A., 2023. The Evolving Interdependencies between Banks and Fintechs within Open Banking Platforms. In *International Conference on Information Systems*, Hyderabad, India. Association for Information Systems. AIS Electronic Library.

[28] He et al. (2023); Padilla, J., 2020. Big Tech 'Banks', Financial Stability and Regulation. Financial Stability and Regulation (April 20, 2020).

[29] Mansour & Ghazawneh (2023); Botta, A., Digiacomo, N., Höll, R. and Oakes, L., 2018. PSD2: Taking advantage of open-banking disruption. McKinsey and Company; Brodsky & Oakes (2017).

[30] He et al. (2023).

[31] Ozcan & Zachariadis (2021); Palmieri, A. and Nazeraj, B. 2021. Open banking and competition: an intricate relationship. *EU and comparative law issues and challenges series (ECLIC)*, 5, pp.217-237.

[32] Bonina, C., Koskinen, K., Eaton, B. and Gawer, A., 2021. Digital platforms for development: Foundations and research agenda. *Information Systems Journal*, 31(6), pp.869-902; Ghazawneh & Henfridsson (2013); de Souza, C.R., Figueira Filho, F., Miranda, M., Ferreira, R.P., Treude, C. and Singer, L., 2016, May. The social side of software platform ecosystems. In Proceedings of the 2016 *CHI conference on human factors in computing systems.*

mutual value co-creation; something that is disruptive to the classic model of banking. The development of open APIs and the emergence of open banking platforms can, therefore, be characterized by expanding the scope of service development and exchange and prompting novel conditions for platform governance and competition among banks and non-bank actors.

The governance of digital platforms is a central issue[33] because it concerns how platform owners (banks) attract complementors (Fintechs), how value is co-created, and how to ensure quality complementary contributions and enable generativity and innovation[34]. Governance structures are critical to platform governance, given that they serve as mechanisms for coordinating behavior across multiple actors with distinct interests.[35] These structures dictate the rules that govern access to authority and resources (e.g., who can enter a platform) as well as determine behavior (what one can do) in the platform. The extant literature on digital platforms largely refers to these structures in the context of commercial platforms, such as iOS and Android, and there is a relative consensus about their dominance across different disciplines.[36] However, in the context of open banking platforms, such control structures[37] are neither applied nor used by platform owners to enforce access rules as it is commonly known in commercial platforms (e.g., platform owners like Apple act as private regulators)[38]. Banks, as platform owners, are required by law to provide "open and non-discriminatory access" to customer banking data by licensed TPPs that increases their autonomy as external complementors. This is an entirely different practice of access to open banking platforms compared to commercial mobile platforms. Bank customers also play an important role since they have decision-making rights on using their banking data by TPPs, not the platform owner. Open accessibility to banking data, which is at the heart of PSD2, provide opportunities for any licensed TPP, Fintech, or startup to access banking data and develop service innovations without being constrained by platform rules such as gatekeeping (input control) and decision rights (deciding complementor responsibility and autonomy). PSD2 and the development of open banking platforms by banks redefine platform openness in that external complementors basically have guaranteed access to the platform and its resources.[39]

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[33] Gawer (2022).

[34] Constantinides et al. (2018).

[35] Staub et al. (2022); Ghazawneh & Henfridsson (2013); Tiwana, A., Konsynski, B. and Bush, A.A., 2010. Research commentary—Platform evolution: Coevolution of platform architecture, governance, and environmental dynamics. *Information Systems Research* (21:4), pp.675-687.

[36] Staub et al. (2022).

[37] Gawer (2022); Broekhuizen, T.L., Emrich, O., Gijsenberg, M.J., Broekhuis, M., Donkers, B. and Sloot, L.M., 2021. Digital platform openness: Drivers, dimensions and outcomes. Journal of Business Research 122, pp.902-914; Constantinides et al. (2018); Karhu, K., Gustafsson, R. and Lyytinen, K., 2018. Exploiting and defending open digital platforms with boundary resources: Android's five platform forks. *Information Systems Research* (29:2), pp.479-497.

[38] Gawer (2022).

[39] In commercial platforms such as Apple's iOS for instance, an App developer is vetted, and access to the platform is regulated by Apple, while an App developer for Nordea's API marketplace has a legal right to access the platform.

These transformations of governance structures as well as the openness of boundary resources create a new set of challenges and opportunities for governing digital platforms and navigating competitive dynamics and shifting power. Both platform owners and complementors may seek to find new sources of value and develop strategies for monetizing open APIs, ensure a healthy platform environment with high-quality complementary contributions, which in turn attract and connect with new actors who can contribute into the scalability of open banking platforms, and create new competition conditions with open APIs. The primary premise here is that open banking platforms, as an emerging type of digital platforms, represent distinct platform characteristics (such as increased complementors' autonomy) in a highly regulated banking environment, novel compliance and openness structures, and new forms for platform owner-complementor competition. From the perspective of the modular platform architecture[40], these characteristics influence how platform owners develop the core platform module (e.g., developing compliance and premium APIs) as well as how they govern interactions with external complementors at the peripheral core (e.g., offering open APIs as a means of generating profit) in order to enable generativity and innovation.

In this changing banking landscape, banks find themselves in an uncharted territory where they have to show technological prowess and act like "tech giants" (for both compliance and competitive reasons) in making API offerings and orchestrating generative interactions with multiple platform actors, which form the basis for competitiveness in an emerging open banking ecosystem. A recent report by Innopay Open Banking Monitor (OBM)[41], published in 2023, showed that payment APIs are on the rise globally accounting for 34 percent of all API functionalities within banking. It also reported that hundreds of API developer portals are being developed by banks around the world with Nordea Bank in Sweden offering the best developer portal in the world. In another report, Finansinspektionen[2] also reported that open banking payments in Sweden are common with 100-150 million payment initiations by TPPs, even though other methods are still dominant (e.g., cards and Swish).[42] Within the EU, electronic payments in 2021 have been increasing to €240 trillion compared to the previous €184 trillion in 2017. Finally, the implementation of PSD3 is around the corner, further pushing banks to improve both their technical performance and compliance, thereby driving improvements in customer security and fostering increased competition for better products and services. When it comes into force in 2026, Swedish banks will have to comply with PSD3 and FiDA[43], while continuing to develop their API offerings and reconsidering their banking practices in order to remain profitable and competitive, perhaps even "survive" in a changing banking landscape.

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[40] Tiwana et al. (2010).

[41] Innopay Open Banking Monitor (OBM).

[42] Finansinspektionen. Open Finance in Sweden. *Report,* 2023-06-28. https://www.fi.se/en/published/reports/reports/2023/open-finance-in-sweden/

[43] FiDA refers to the Framework for Financial Data Access which is a legislative proposal that builds upon open banking and expands the scope of data to include savings, pensions, mortgages, insurances to enable open finance.

1.1 Research aims and questions

This report is set out to investigate the open banking market in a Swedish context. It primarily aims to explore competition perspectives on PSD2 compliance and open banking focusing on interactions and relationships by major market actors, including incumbent banks and third party providers (TPPs). It also aims to identify key entry barriers and opportunities for TPPs in the open banking market through examining regulatory drivers, technological challenges, and competitive pressures that may hinder market entry. Furthermore, the report seeks to explore opportunities arising from PSD2 compliance, innovation potential, and partnerships with incumbent banks. The overall aim from the report is to explore the conditions for the emergence of an open banking ecosystem that involves multiple actors who engage in the development of customer-centered payment service innovations.

In order to achieve these aims, a qualitative investigation were conducted through interviews with participants from both Swedish banks and Fintechs. The research seeks to answer the following questions:

- What are the conditions for competition between banks and TPPs in the open banking market?

- How do banks and TPPs navigate shifts in the competitive landscape as banks begin implementing PSD2 compliance while TPPs get access to banking data and offer competitive payment services?

- What entry barriers and opportunities do TPPs faced with considering regulatory, technological, and competitive dynamics in the open banking market?

1.2 Disposition

This research report is structured into seven major chapters. Each chapter focuses on issues that set the foundation for the chapter thereafter. The disposition presented here shows the overall structure of the report as well as offers a brief summary of each individual chapter.

- The first chapter offers a broad overview of key issues discussed in the report including PSD2, open banking, access to data, third party providers, Fintechs, banks, competition, digital platform models, platformization of banking, and Fintech-bank relationships.

- The second chapter focuses on developing a conceptual basis for key constructs including digital platforms, ecosystems, platform business models, and platformization. It offers a theoretical elaboration on the concept of platform and platform business models including different perspectives on platforms in terms of key actors, actor roles, the nature of value, as well as product and

service development. One main aim from this chapter is to develop a theoretical basis for platformization in order to discuss the platformization of banking.

- The third chapter concentrates on introducing PSD2 and presenting its evolution as a regulation including key milestones, motivations for regulatory revisions, the problems it addressed, and its regulatory objectives. There is also an important discussion on security and trust issues under PSD2 and their implications for data integrity and customer protection. Furthermore, the chapter will give some reflections on the relationship between PSD2 and other regulations mainly GDPR. A selection of PSD2 articles is presented to highlight the main areas related to data processing, security, and technical standards in the context open banking. A discussion is then offered regarding the platformization of the banking industry and the emergence of open banking. The discussion focuses on how compliance with PSD2 and mandating banks to provide access to data by TPPs has increased the rapid pace of platformization in the banking industry, which is illustrated through banks engaging in platform-like exchanges with new entrants and the development of technological infrastructure and API resources. It also presents different conceptualizations of open banking and discusses the benefits and challenges of open banking for both banks and Fintechs.

- The fourth chapter describes platform competition and the new conditions of competition in the context of banking. This chapter offers a conceptual discussion of platform competition in contrast to traditional understandings of competition. It highlights the role of digitalization and digital platforms in shifting product architectures and introducing novel ways of developing service innovations by groups of actors who engage in mutual value co-creation in multi-sided digital platforms. Additionally, the chapter discusses platform competition in the context of open banking. In this part, the focus is on understanding new conditions for competition as more external actors are entering the market, and the role of API platforms in enabling third party providers to compete with banks. It also explores the dynamics between banks and Fintechs as well as the challenges facing each actor. The chapter is concluded by a discussion on emerging challenges facing both Fintechs and banks by the Big Tech.

- The fifth chapter focuses on the empirical process of the research. The chosen research approach is presented along with details about the context of investigation. It also discusses participant selection and outlines the processes of data collection and analysis.

- The sixth chapter offers an extensive presentation of key findings. The aim from this chapter is to highlight the empirical foundation behind major themes that were identified during data analysis. Raw interview data showing key insights and observations is introduced to support of these themes, which are later elaborated on in the discussion.

- The final chapter focuses on concluding the report by discussing the main findings. Throughout the chapter, major themes are discussed and elaborated with emphasis on addressing the research aims and questions. Major arguments are discussed about competition dynamics within open banking. Entry barriers and challenges are also presented which highlight the role PSD2 plays in enabling or hindering both banks and Fintechs from engaging in the open banking market. The chapter also contains reflections on major themes such as whether PSD2 is sufficient for fair competition in the banking industry and the current conditions in Sweden for setting a foundation for an open banking ecosystem.

2 Digital platforms and platformization

2.1 Digital platforms and ecosystems

There are many definitions of digital platforms. However, there is a common feature among all of them that is a digital platform consists of a platform core – a technological architecture – where multiple heterogenous actors engage in mutual value-generating activities. Digital platforms[44] have three basic characteristics that are: technologically mediated, enable interaction between heterogeneous user groups, and allow these groups to carry out defined tasks. Understanding what a digital platform is often depends on the perspective or the area in which it is studied.[45] One perspective focuses on the technological architecture of digital platforms, including digital characteristics such as modularity and the layered architecture.[46] Another perspective, within information systems (IS) management, concentrates on the socio-technical features of digital platforms and their impact on organizational structures.[47] There are also economic perspectives on digital platforms that focus on demand and supply functions, more precisely how these are different from traditional market settings (especially in relation to pricing strategies and financing dynamics).[48] Table 1 below offers a selected list of digital platform definitions and perspectives.

Table 1 Perspectives and definitions of digital platforms

Source	Perspective	Definition
Grover and Lyytinen (2022)	Economics	Digital platforms are means of interaction and value creation and exchange.
Constantin-ides et al. (2021)	IS Management, Economics	Digital platforms as a set of digital resources—including services and content—that enable value-creating interactions between external producers and consumers.
Kretchmer et al. (2020)	Management	Meta organizations, or "organizations of organizations" that are less formal and less hierarchical than firms, and yet more closely coupled than traditional markets.
Yoo et al. (2010)	IS Management	A digital product platform typically encompasses a particular range of layers (e.g., content and service layers) that can function as a new product, but simultaneously enable others to innovate upon using firm-controlled platform resources (e.g., SDKs and APIs).

[44] Bonina et al. (2021).

[45] Ibid.

[46] Jacobides, M.G., Cennamo, C. and Gawer, A., 2024. Externalities and complementarities in platforms and ecosystems: From structural solutions to endogenous failures. *Research Policy*, 53(1), p.104906; Constantinides et al. (2021); Mukhopadhyay, S. and Bouwman, H., 2019. Orchestration and governance in digital platform ecosystems: a literature review and trends. *Digital Policy, Regulation and Governance*, 21(4), pp.329-351; Yoo, Y., Henfridsson, O. and Lyytinen, K., 2010. Research commentary—the new organizing logic of digital innovation: an agenda for information systems research. *Information systems research*, 21(4), pp.724-735.

[47] Bonina et al. (2021); De Reuver, M., Sørensen, C. and Basole, R.C., 2018. The digital platform: a research agenda. *Journal of Information Technology*, 33(2), pp.124-135.

[48] de Reuver et al.(2018).

Source	Perspective	Definition
Tiwana et al. (2010)	IS Management	The extensible codebase of a software-based system that includes a core module, add-on modules using core functionality and interfaces through which the core and multiple add-on modules interoperate.

Digital platforms can also be comprehended depending on their type or purpose. The literature on platforms suggest two main types: transaction platforms[49] (so-called multi-sided markets or exchange platforms) and innovation platforms[50]. Multi-sided platforms or markets are defined as hubs or intermediaries for value exchanges between two or more markets of users and producers or buyers and sellers.[51] Their main purpose is to facilitate transactions between individuals and organizations such as connecting buying and sellers (e.g., Amazon), recruiters and job seekers (e.g., LinkedIn), borrowers and investors (e.g., LendingClub), and drivers and passengers (e.g., Uber and Lyft). These platforms tend to be studied from an economic perspective that largely focuses on supply and demand. The main focus is connecting user groups (the demand side) with complementors groups (the supply side) and trying to estimate the potential benefits or so-called network effects or externalities[52] for all groups. Given that there are direct and indirect benefits for users on both sides of the market, the value for one group increases as the size of the other group increases and vice versa. As both the demand and supply sides connect, the generation of network effect becomes a fundamental source of value for both users and platform owners in transaction platforms.[53]

Innovation platforms serve a different purpose as they act as a foundation for the development of complementary products and services. The technological, or modular[54], architecture of innovation platforms offer innovative capabilities including modules, which can be accessed by platform complementors (i.e. app developers) in order to develop platform complements (i.e. apps)[55]. These platforms are at

[49] Bonina et al. (2021) discuss that the origins of digital platforms especially transaction platforms which are associated with the dot.com era along the emergence of internet-based companies that enable transactions between multiple sides of the market and benefiting from network effects. Prior to digital platforms, the concept of 'platform' was first used in management literature, borrowed from engineering design, to refer to product platforms (Jacobides et al., 2024) which consist of specific modular product architectures (Yoo et al., 2010) that help firms to (re)use them for the development of product families and common assets.

[50] Jacobides et al., 2024; See also Gawer (2022) who identifies a third platform type so-called hybrid platforms which combine characteristics of both transaction and innovation platforms; Bonina et al. (2021); Cusumano, M.A., Gawer, A. and Yoffie, D.B., 2019. *The business of platforms: Strategy in the age of digital competition, innovation, and power* (Vol. 320). New York: Harper Business.

[51] Cennamo, C., 2021. Competing in digital markets: A platform-based perspective. *Academy of Management Perspectives*, 35(2), pp.265-291; Zhao, Y., Von Delft, S., Morgan-Thomas, A. and Buck, T., 2020. The evolution of platform business models: Exploring competitive battles in the world of platforms. *Long Range Planning*, 53(4), p.101892; de Reuver et al. (2018).

[52] Network effects or externalities refer to benefits for users on both sides of the market, which are discussed in detail under section 2.2 on platformization and platform business models.

[53] Bonina et al. (2021); Constantinides (2021).

[54] Yoo et al. (2010).

[55] Constantinides (2021); Gawer, A. (2014). Bridging differing perspectives on technological platforms: Toward an integrative framework. *Research Policy*, 43(7), 1239–1249.

the heart of the multi-billion dollar 'app economy' that is led by platform owners such as Apple and Google who offer digital interfaces such as APIs in their mobile application marketplaces.[56] Such APIs can be accessed and used by an ecosystem of third-party app developers to develop services and extend the functionality of the platform. The platform architecture is then conceptualized into two distinct types of architecture: a core platform architecture consisting of core modules that is controlled and offered by the platform owner, and a peripheral architecture of apps and services that is developed by external complementors.[57] Due to the underlying material properties of digital technology and the immaterial nature of information, there is potential for an infinite scope of digital products and services to be developed. Developers in innovation platforms use APIs and other digital resources offered by the platform owner to add new components and functionalities that extend the boundaries of the platforms beyond its initial conception.[58] Table 2 below shows key characteristics of transaction and innovation platforms including their core digital features.[59]

Table 2 Characteristics of Transaction and Innovation Platforms and Their Core Features

	Transaction Platforms or Multi-sided Markets	Innovation Platforms
Purpose	Match users or user groups, the value for a user increases with the number of users in a user group.	Offer or act as a foundation upon which complementors can build platform complements including apps and services.
Core digital features	Expansibility of digital information, massive processing power.	Immaterial properties of digital information, combinatorial properties, generative properties
Basis for value creation	Facilitating the exchange of services and information among different parties of the multi-sided market through matchmaking (i.e. finding an opposite to transact with) and reducing friction in their interaction.	Platform openness to enable third-party developers to use platform resources such as APIs and develop service innovations.
Basis for value capture	Monetizing user behavioral data and targeted advertising	Developer access fees, advertising.
Examples	Uber, Amazon, Facebook	iOS, Android

Nowadays, both transaction and innovation platforms are ubiquitous as people use them extensively in their everyday lives.[60] Digital platforms also represent the dominant sociotechnical arrangement governing most production and exchange activities associated with products and services in industrial organizations. The

[56] Bonina et al (2021); Ghazawneh, A., and Mansour, O. 2015. "Value Creation in Digital Application Marketplaces: A Developer's Perspective," in Proceedings of the *36th International Conference on Information Systems*, Forth Worth.

[57] Bonina et al. (2021).

[58] Fürstenau, D., Baiyere, A., Schewina, K., Schulte-Althoff, M. and Rothe, H., 2023. Extended generativity theory on digital platforms. *Information Systems Research*, 34(4), pp.1686-1710; Bonina et al. (2021).

[59] Table 2 is adapted from Bonina et al. (2021).

[60] The ubiquity of mobile devices, advancements in communication technologies like 5G, and also convenient prices for internet-capable devices contributed to the rapid rise and evolution of digital platforms.

rapid rise of digital platforms[61] is attributed to the unique features of digital objects including reprogrammability, editability, distributedness, self referentiality, and homogeneity of data[62]. These features enable infinite representations in distributed settings where no single owner owns the platform core and dictates a design hierarchy.[63] In other words, there is no overarching modular design of tightly coupled components for the systematic re-use of common assets and activities to develop product families like in modular product architectures that forms the basis for physical product design.[64] Digital platforms incorporate a set of modules, which are add-on software subsystems that connect to the platform to add to its functionality.[65] These modules represent applications developed by third-party developers at different layers including device, network, service and content layers that facilitate the emergence of a layered modular architecture.[66] For instance, app developers in digital application marketplaces (such as iOS and Android) would use existing resources and combine them to develop novel products and services, which were likely inconceivable at the time when smartphones and software technologies were initially developed. Fürstenau et al. offered an explanation:

> *Platforms can be created from (and extended with) product-agnostic components on content, service, network, or device layers. Innovations on each layer lead to cascading effects when layers are loosely coupled. For example, when new social media or video game applications were added to the App Store, iOS and Apple iPhone became more than a combination of a phone and an operating system. Innovations on the service and content layers expanded the product boundaries, and the iPhone became a gaming device and a social media tool.*[67]

In this way, the agnosticism of digital complements enables an infinite number of services and components to be added into the platform architecture in a generative fashion. Modularity in this context is a unique architectural characteristic of digital platforms that further enables generativity.[68] Modularity refers to the degree to which changes within particular subsystems or modules do not create ripple effects in the behavior of other parts of the ecosystem.[69] It describes the partitioning of

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[61] Gawer (2021) discusses a third type of digital platforms called hybrid platforms that combine the characteristics of both transaction and innovation platforms.

[62] Cennamo, 2021; de Reuver et al., 2018; Yoo et al., 2010.

[63] Jacobides et al., 2024; de Reuver et al., 2018.

[64] Jacobides et al., 2024; Yoo et al., 2010.

[65] de Reuver et al., 2018; Tiwana et al., 2010; Yoo et al., 2010.

[66] The layered architecture of digital technology is discussed by Yoo et al. (2010). It consists of four generic key layers: the device layer which includes physical hardware and logical capability (operating system); the network layer includes physical hardware such as cables and transmitters and a logical capability (communication protocols), the service layer which includes applications that serve the users; and the content layer which includes various forms of data such as text, sound, and video.

[67] Fürstenau et al. (2023); Bonina et al. (2021).

[68] Constantinides, 2021; Tiwana et al., 2010; Yoo et al., 2010.

[69] Tiwana et al., 2010.

platforms into a set of functionally specialized components that operate independently (unlike in traditional integral product architectures[70]) and can be easily removed or replaced. The separation or decoupling – often labeled loose coupling – between modules as well as the use of standard platform-module interfaces such as APIs help to achieve modularity, which decreases complexity and increases flexibility. Interface standardization then helps in connecting and combining independent modules that enable fluid product boundaries, which in turn facilitate the development of limitless innovations.[71] Grover and Lyytinen explained:

> *These novel features create unprecedented scale and scope benefits that accrue from the loosely coupled product architectures of digital products and their bitstring interfaces. These features enable continued combinatorial innovation, easy repurposing and generativity which radically expand the variety and volume of participants on (product) platforms (reach effects) and widen the novelty and range of interactions between participants (range effects).* [72]

Finally, digital platforms are generative systems. Generativity emerges in the relationships and interactions between platform providers and complementors.[73] Modularity, loose coupling, and interface standardization all serve as enablers for generative interactions in digital platforms that trigger the expansion of ecosystem boundaries.

2.1.1 Digital ecosystems

Digital platforms are main building blocks of digital ecosystems. Jacobides et al. explained the relationship between a digital platform and a digital ecosystem:

> *Platforms and ecosystems are partly overlapping and closely interrelated, despite the largely independent trajectories the respective literatures have taken. Any effort to relate the two constructs will inevitably depend on the exact definitions used in each case: the tighter the definitions, the sharper the distinction. However, a platform usually entails an ecosystem, and an ecosystem often rests on a platform.*[74]

Jacobides et al. further discuss three main types of ecosystems. First, business ecosystems that describe a community affecting a firm's ability to adapt to its environment. Second, innovation ecosystems that aggregate all actors whose contributions

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[70] The integral product architecture often used in industrial organizations is characterized by complex and overlapping mapping between functional elements and physical components, where interfaces are not standardized and tightly coupled. Source: (Yoo et al., 2010).

[71] Constantinides, 2021; Tiwana et al., 2010.

[72] Grover, Varun and Lyytinen, Kalle (2022) "Special Issue Editorial: Platform Competition in the Digital Era - Overview and Research Directions," *MIS Quarterly Executive*, 21(1).

[73] Fürstenau et al. (2023).

[74] Jacobides et al. (2024).

are essential to delivering value and innovation to the final customers. Third, platform ecosystems that aggregate developers of complementary products required to extend the value of a core platform technology. There are also 'multi-product' ecosystems, which are driven by a single firm that engages in the development of multiple connected products and services (e.g., Apple's TV services, cloud storage, smartphones, and computers). A defining feature of platform ecosystems is the interdependence between a stable platform that interfaces with a dynamic and heterogeneous set of complementary components for generative development of products and services.[75]

Hein et al. identify three core building blocks of ecosystems: platform ownership, value-creating mechanisms, and complementor autonomy.[76] Ownership in platform ecosystems is not limited to the central authority controlling the platform technological core or its resources (the platform owner), but includes the distribution of power and relationships among actors in the ecosystem.[77] Ecosystem actors are legally independent and autonomous and their relationships are neither specific nor enduring in a contractible sense. Complementor autonomy describes the degree of freedom complementors like third-party providers have when co-creating value with the digital platform. Platform ecosystems rely heavily on autonomous agents in platform expansion and growth through complementary contributions and value propositions.[78]

Three ecosystem archetypes also exist, representing different ownership models and degree of power centralization.[79] Centralized ecosystems where power is centralized and the platform is controlled by a single owner such as Facebook and Apple. Another archetype is when the ecosystem is formed by a consortia or a group of actors who own the platform such as Cloud Foundry that is an open source, multi-cloud application platform-as-a-service controlled by large companies including IBM, Dell, SAP, CISCO, and others. The last archetype is decentralized ecosystems governed by peer-to-peer communities such as blockchain platforms. The degree of complementor autonomy varies in these ecosystems. High levels of autonomous behavior is when actors have loosely coupled relationships with the platform such as in Google's Android, while low-autonomy complementors can be relatively dependent on the platform such as Apple app developers who are affiliated as developers.

The growth of an ecosystem and its evolutionary dynamics are largely dependent on the openness of interfaces as well as the level of complementor autonomy. Platform governance and coordination are central in ecosystems to balance control

[75] Kretschmer et al. (2020).

[76] Hein et al. (2020).

[77] Kretschmer et al. (2020); Hein et al. (2020).

[78] Jacobides et al. (2024); Hein et al. (2020); Kretschmer et al. (2020).

[79] Hein et al. (2020).

with decision rights and generativity.[80] The success of a platform ecosystem then depends on facilitating value co-creation among all actors as platforms attract third-party complementors and provide them with incentives to contribute high-quality services and products. The platform owner provides the core platform that acts as intermediary matching supply to demand, and orchestrates value exchanges among actors enabling the formation of a multi-sided market, leveraging network effects, and economies of scale.

2.2 Platformization and platform business models

Digital platforms are positioned today as a core source of value and revenue in many industries.[81] The rapid pace of digitalization and continued digitization of analog forms of representation made digital platforms dominant forms of organizing in the digital age.[82] Cennamo argues that digital platforms can be seen as innovations in market design that has the potential to change market architectures through altering the ways by which customers access and consume digital products and services. The unique features of digital platforms and their effects transform the nature of products and services as well as forms of organizing are key drivers for constant platformization of industries.[83] Platformization is a strategy for operating multi-sided platforms and connecting buyers and sellers without controlling or owning the products or services that are being sold.[84] Amazon is a good example of such a firm that demonstrates the shift towards platformization and the application of platform business models.[85] It started as an online retailer which gradually moved towards operating a multi-sided platform model that allows buyers and sellers, as well as other third parties such as advertisers, software developers, cloud providers to interact with each other and engage in value co-creation. Other multi-sided platforms that are currently dominant in various industries include mobile application marketplaces (iOS and Android), as well as marketplaces for books (Amazon's Kindle), music (Soundcloud), car sharing (Uber), room sharing (Airbnb), videos (YouTube, Twitch), and crowdsourcing (Kickstarter). These platforms enable faster, cheaper, and extensive interactions among different actors on different sides of the market that are engaged in value co-creation and exchange.

It is established in platform literature that such interactions at the platform core - the technological hub connecting users as well as products and services[86] - create network effects or externalities that fundamentally change traditional strategy and

[80] Schreieck (2024); He et al. (2023); de Reuver et al. (2018); Ghazawneh & Henfridsson (2013).

[81] Grover & Lyytinen (2022); Gawer (2022); Cennamo (2021); Kretschmer et al. (2020).

[82] Gawer (2022); Grover & Lyytinen (2022).

[83] Grover & Lyytinen (2022).

[84] Zhao et al. (2020); Constantinides (2018).

[85] Constantinides et al. (2018); de Reuver et al. (2018).

[86] Cennamo (2021).

business models[87]. Network effects refer to the benefits that users enjoy on one side of the platform because of interactions with and among users on its other side. As platforms attract a larger installed base (i.e., a larger number of users), there are both direct positive network benefits for users as they interact with others, as well as indirect benefits from externalities that a large installed base has on motivating independent third parties or external complementors to develop digital products and services. Network effects has become the main source and driver for value creation and competition outcome.[88] The logic of value creation in platform environments like multi-sided markets is, thus, centered on the idea that value for one group increases as the number of participants and their interactions in the other group increase.[89] This logic has a disruptive impact on traditional business models and competition in markets as Cennamo explained:

> *This change in the nature of digital markets brings along a shift in the economics and the underlying nature of competition…, dismantling the contours of sectors and industries as we knew them, and creating new opportunities while destroying long-successful business models… The characterizing feature of digital markets is indeed the presence of a core, platform technology that acts as a data hub channeling and integrating information from/to users and from/to multiple connected products and services, and as market infrastructure connecting users and suppliers of goods.*[90]

Business models, which describe how firms create value, are traditionally focused on linear supplier-buyer relationships.[91] Firms that engaged in such linear relationships are often called 'pipeline businesses', which control a linear series of activities along the value chain.[92] The firm has exclusive ownership of resources and products, value is created through product features and customer benefits, and the basis for competition is product development and pricing. In a platform context, platforms operate and harness an innovation value chain[93] where the platform owner offers an infrastructure for innovation to ensure complementarity and integration of digital products and services, while external third parties offer complementary innovations that extend the functionality of the platform and enhances its appeal to the installed base. Apple iOS is a popular marketplace for complementary innovations[94] where Apple as a platform owner offers a platform core (i.e. SDKS and APIs). This core is in turn used by third party developers and external complementors to develop innovative applications that extend the functionality and productivity of

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[87] Gawer (2022); Bonina et al. (2021); Zhao et al. (2020); Constantinides et al. (2018); de Reuver et al. (2018).

[88] Gawer (2022); Cennamo (2021); Bonina et al (2021); Zhao (2020).

[89] de Reuver et al. (2018).

[90] Cennamo (2021).

[91] Zhao et al., 2020.

[92] Grover & Lyytinen, 2022; Constantinides et al., 2018.

[93] Cennamo, 2021; Zhao et al., 2020; Parker, G. and Van Alstyne, M., 2024. Platforms: Their Structure, Benefits, and Challenges. Hannes Werthner· Carlo Ghezzi· Jeff Kramer· Julian Nida-Rümelin· Bashar Nuseibeh· Erich Prem·, p.523.

[94] Cennamo, 2021.

mobile devices. Such platforms represent new organizational forms for innovation and complementarities[95], and show how platformization triggers fundamental changes and disruptions in business models and the way business is carried out and revenues are generated[96].

There are several features of emerging platform business models that distinguish them from traditional models. The most defining feature is that platform businesses thrive through incentivizing high-quality complementors to join the platform and offering them a smooth transaction environment.[97] This process is enabled by another key feature of platform models, that is, the platform's degree of architectural control, which determines who can access the platform and who is allowed to produce, sell, and consume related products and services.[98] Kretchmer et al. argue that control over the technological architecture of the platform is a primary source of authority unlike the ownership of production assets in traditional organizations. There is also the concept of central relationality that describes a form of decentralized governance of loosely coupled product architectures that are leveraged by independent autonomous complementors, i.e. they are not bound by managerial authority lines and enjoy less discretion relative to traditional hierarchical organizations.[99] App developers, such as Apple's iOS, accept the terms and conditions of the platform to pay platform fees and commissions in exchange of access to the user base, development tools, and the opportunity to receive revenues and feedback. The distinctiveness of the platform technological architecture is another important feature of platform businesses that is a source of power, differentiation and market positioning.[100] The configuration of the platform architecture has significant effects on the technological functionalities for both users as well as innovations by external complementors. An open platform architecture allows openness to access and resources that attracts complementors, and which in turn fosters generativity that facilitates the development of diverse products and services for users.[101]

However, there are risks with open platforms such as platform forking, which is a hostile competitive strategy by platform actors attempting to exploit the technological core of other platforms.[102] Further, pricing is another defining feature of platform business models in that it is used as a 'coordination mechanism' to grow complementors' participation in the platform and offer greater benefits to the users.[103] Traditionally, pricing is used by firms to capture a larger market value by

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[95] Cennamo, 2021; Kretschmer et al., 2020.

[96] Kretschmer et al., 2020; Veit, D., Clemons, E., Benlian, A., Buxmann, P., Hess, T., Kundisch, D., Leimeister, J.M., Loos, P. and Spann, M., 2014. Business models: An information systems research agenda. *Business & Information Systems Engineering*, 6, pp.45-53.

[97] Kretschmer et al., 2020; de Reuver et al., 2018

[98] Cennamo et al., 2021; Kretschmer et al., 2020.

[99] Staub et al., 2022; Kretschmer et al., 2020; Constantinides et al., 2018.

[100] Cennamo et al., 2021; Kretschmer et al., 2020; Yoo et al., 2010.

[101] Staub et al., 2022; Karhu et al., 2018, Constantinides et al. 2018.

[102] Karhu et al., 2018.

[103] Cennamo, 2021.

hurting rivals' position and forcing them out of the market. Nowadays, pricing within platforms is a value-creating strategy associated with platform openness. The openness of a platform describes the extent that a platform facilitates and grants unconditional access and participation to platform actors including users and third parties. Platforms can make decisions regarding subsidies to groups of users and complementors in certain manners. Platforms may choose to subsidize certain complementors that they deem valuable to platform growth, while granting users free access[104] to services like in transaction platforms such as Facebook[105]. Pricing is therefore a way to attract complementors, increase variety of complements, and enable platform market dominance. With respect to value creation, platform businesses focus on enlarging the value of standalone product offerings (i.e. mobile apps) by extending the range and scope of its uses for the customers through complementary innovations. In other words, platforms help in connecting products, a physical product such as a smartphone, and apps for digital entertainment and productivity that results in increased value due to the integration of product and service offerings. Table 3[106] below compares key features of pipeline and platform businesses:

Table 3 Features of Pipeline and Platform Businesses

	Pipeline businesses (traditional business models)	Platform businesses (platform business models)
What is the role of the focal firm?	Producer operating linear supplier-buyer relationships	Intermediary enabling interactions among actors
What is the source of differentiation?	Ownership of unique resources, hierarchical control	Control over a distinct technological architecture, incentivizing complementors, and coordinating transactions
Who owns the product?	The focal firm (change of ownership after sale)	Users
How is value created?	Product features	Enabling and facilitating generative value co-creating interactions and activities
How is value monetized?	Charging money for product features	Zero pricing for users, access fee for complementors
What is the basis of competition?	Product development, price	Business model development

[104] Lundqvist (2022) argue that while users get access to platform services to the price of zero, they still pay with data and attention given to platforms, which is leveraged to create high profits through ads.

[105] Cennamo et al., 2021.

[106] Table 3 is adapted from Zhao et al. (2020).

3 PSD2 and the Platformization of Banking

3.1 *Regulate to innovate* – The Enactment of PSD2

PSD2 stands for the revised Payment Services Directive. It is a Directive (EU) 2015/2366 that is part of a global trend in bank regulation emphasizing security, innovation, and market competition.[107] The revised directive was initially enacted by the EU in 2015 to overcome the barriers in the original directive (PSD)[108] for new types of payment services and improve the level of customer protection and security. In revising the original PSD, the European Commission found restricted access to key components of the payment infrastructure because of banks taking advantage of their market position in comparison to new entrants into the payment and retail market. The key difference between PSD and PSD2 is the extension of the scope of the regulation that covers more payment services and more types of payment service providers including enhanced transparency, security and consumer protection.[109] Under PSD2, two new regulated payment services are specified which include Payment Initiation Services (PIS) and Account Information Services (AIS). Furthermore, PSD2 specifies two types of third party providers who have legal right for direct access to customer accounts that is the Payment Initiation Service Providers (PISPs) and Account Information Service Providers (AISPs).

As a directive, PSD2 provides a common legal framework for all retail payments in the EU under an umbrella named "open banking" to expand the level of integration and efficiency in the market and increase consumer protections.[110] The primary aim of PSD2 is to open the payment market for new players to promote innovation and competition as well as enhance customer rights and protections. To accomplish this, PSD2 obliges Account Servicing Payment Service Providers (ASPSPs) to put in place dedicated data access permissions[111] or "permissions dashboards" to allow third-party providers (TPPs) to manage their granted open banking access permissions. With its emphasis on encouraging new entrants into the payment market through

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[107] Polasik et al. (2024); Botta et al. (2018).

[108] EU monitor: Explanatory Memorandum to COM (2023)367 – Payment services in the internal market. https://www.eumonitor.eu/9353000/1/j4nvhdfdk3hydzq_j9vvik7m1c3gyxp/vm4gccye3jyr. The original PSD was adopted in 2007 to create a single, integrated, and harmonized payment market in the EU that facilitates domestic and cross-border payments both in Euro and other currencies, encourage competition, and enhance consumer rights and protections.

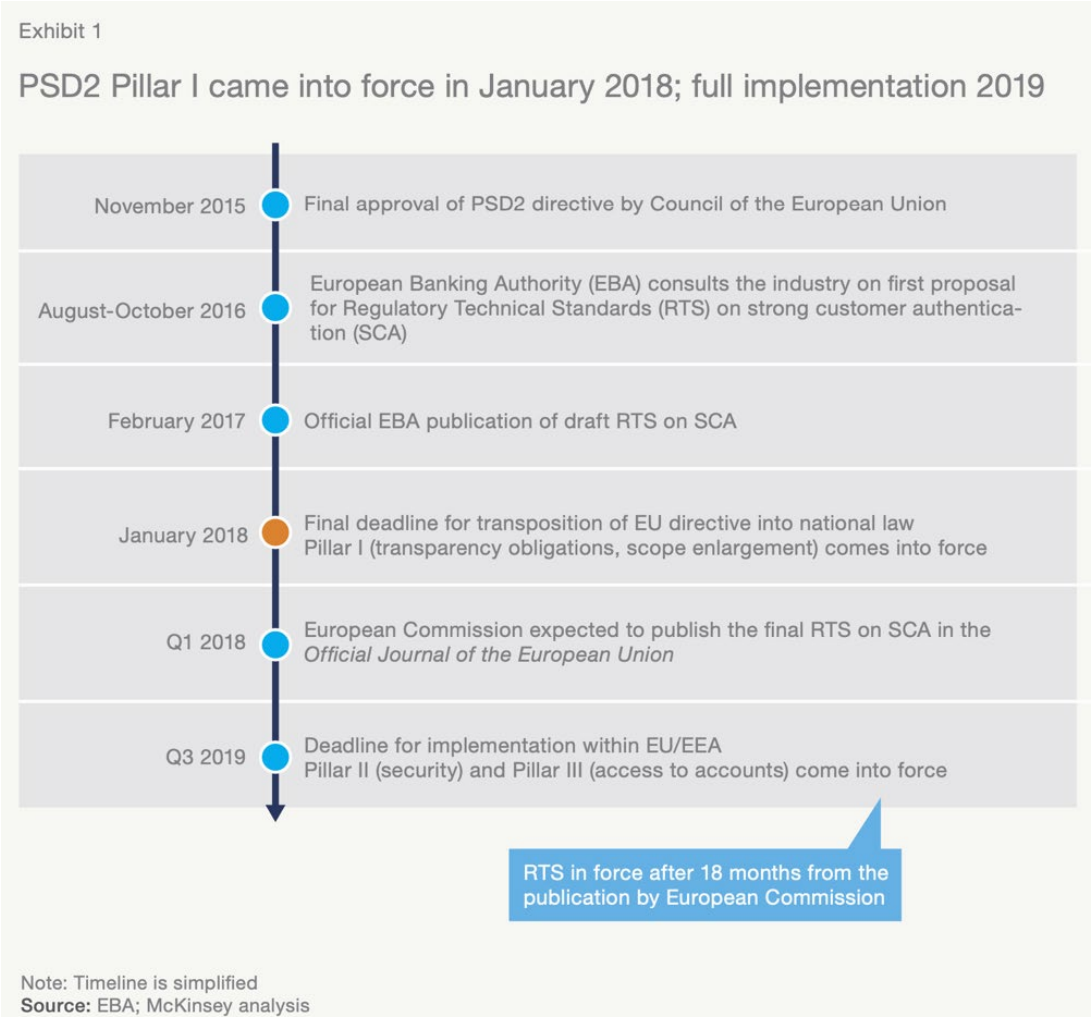
[109] Berber & Atabey (2021).

[110] Gounari et al. (2024); EU monitor; Polasik et al. (2024); Passi, L.F. (2018). An open banking ecosystem to survive the revised Payment Services Directive: Connecting international banks and Fintechs with the CBI Globe platform. *Journal of Payments Strategy & Systems*, 12(4).

[111] The technology to be used by banks to comply with PSD2 and provide access to TPPs is not directly specified in the directive. But most banks largely use APIs for this purpose which are offered in API platforms usually associated with bank websites. In Sweden, many banks develop APIs and publish them publicly in API markets or gateways. It is worth noting that the Regulatory Technical Standards (RTS) recommend the use of APIs for data access by AISPs and PISPs. Besides APIs, screen scraping also allow them access to PSUs accounts using their credentials making it difficult for banks to determine whether the customer or a third party is accessing the account, which makes APIs a preferred option for data access (Berber & Atabey, 2021).

enabling access to banking data, PSD2 is regarded as a radical shift in regulating the financial transactions within the EU.[112] PSD2 is also often viewed as one of the rare cases where regulation precedes innovation, and not vice versa.[113, 114] The research at the time of writing this report shows that PSD2 is in fact quite different from other regulations, because it requires banks to make substantial investments in technologies and develop services to comply, and not only regulate banking activities which is the usual case with bank regulations. Figure 1[115] below shows a timeline of major PSD2 regulatory developments since its approval in 2015 until it came into force in 2019.

Figure 1 PSD2 development timeline



[112] Gounari et al. (2024).

[113] Ozcan & Zachariadis (2018).

[114] While of course the enactment of PSD2 sparked innovation and competition in the retail market by lowering entry barriers for new players and encouraging new partnerships, concerns about shifting powers and customer security are prompting more regulatory measures.

[115] Botta et al. (2018).

There are three main pillars of PSD2.[116] The first concerns transparency including stronger customer rights and transparency in pricing. Transparency also involves enlarging the scope of transactions where at least one party is located within the European Economic Area (EEA). The second pillar focuses on security and includes requirements for Strong Customer Authentication (SCA).[117] The last, pillar 3, focuses on access to accounts or the right to access. This also includes the technological interfaces (APIs) necessary to allow access to banking data by TPPs and facilitate the connection with bank systems to execute payment initiation on behalf of the customers.[118]

Passi suggests that the aim of the revamping of PSD was done in order to enhance the integration and efficiency of the EU payment market, level the playing field for payment service providers (PSPs) including all new entrants, make payments safer and more secure, and protect customers.[119] Passi further adds that an important principle, that is fundamental for competition in PSD2, is to establish the same rules for the same services regardless of whether they are provided by incumbents or newcomers. This facilitates the development of new payment service innovations and enables competition at the level of digital payments enabling more choices and experiences for the customers.[120] It also contributes into the segmentation of the digital payment market by introducing new key players and entrants including customers, intermediaries, TPPs, and technology partners into the financial market.[121] In this respect, PSD2 identifies newly regulated Payment Service Providers (PSPs) namely Account Information Service Providers (AISPs) and Payment Initiation Service Providers (PISPs).[122]

PISPs offer payment initiation service that 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). Payment initiation allows TPPs to initiate payments on behalf of the customers, and with their consent, when they are trying to make a payment for a product. Customers are often given the choice whether to pay for instance directly through their own bank or via a TPP. Choosing a TPP requires that the customer authenticates with their security credentials in order to complete the payment process. Large Fintechs such as Volt in the UK and Trustly in Sweden are examples of TPPs, which offer such payment initiation services in the retail market through offering customer convenient and secure payment experiences without any interaction with their own banks.

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[116] Ibid.

[117] SCA is discussed in detail in the next section.

[118] Ozcan & Zachariadis (2018); Botta et al. (2018).

[119] Passi (2018).

[120] Ibid.

[121] Passi (2018).

[122] Radanović (2024); Gounari et al. (2024).

AISPs, on the other hand, offer account information service that 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). AISPs can access customer account information from multiple accounts to be aggregated and presented in a single application interface. The aggregation of account information helps to give customers better overview of their balances, accounts, and financial transactions.[123] These are services are "read-only", which means that AISPs cannot move or transfer funds between different accounts. There is also Card-based Payment Instrument Issuing Providers (CBPIIP), which perform payment instrument issuing and payment transaction acquisitions. It is important to note that these PSPs are only able to offer these services after explicit consent from the PSU.

To conclude the discussion on PSD2, a helpful summary was published by the EU monitor[124] in an explanatory memorandum on the payment market that offers an impact assessment of PSD2 by the Regulatory Scrutiny Board (RSB). This memorandum specifies key problems in the EU payment market, the consequences of these problems, and the specific objectives to address them. These are pointed out in Table 4 below:

Table 4 Impact Assessment of PSD2

	Key Points
Key problems in the EU payment market	• Consumers are at risk of fraud and lack confidence in payments. • The open banking framework functions imperfectly. • EU supervisors have inconsistent powers and obligations. • There is an unlevel playing field between banks and non-bank PSPs.
Consequences of these problems	• Users (especially consumers, merchants, and SMEs) remain exposed to fraud risk. • Open banking service providers face obstacles in offering basic open banking services, making it harder to innovate and compete with incumbents like card schemes. • PSPs experience uncertainty regarding their obligations, while non-bank PSPs are at a competitive disadvantage compared to banks. • Economic inefficiencies and higher operational costs negatively impact EU competitiveness. • The internal market for payments is fragmented, leading to "forum shopping."
Specific objectives to address the problems	• Strengthen user protection and confidence in payments. • Improve the competitiveness of open banking services. • Improve enforcement and implementation in Member States. • Improve (direct or indirect) access to payment systems and bank accounts for non-bank PSPs.

[123] Ibid.

[124] Explanatory Memorandum to COM (2023)367 – Payment services in the internal market. https://www.eumonitor.eu/9353000/1/j4nvhdfdk3hydzq_j9vvik7m1c3gyxp/vm4gccye3jyr.

3.1.1 Security and trust issues under PSD2

Access to data or the right to access in PSD2 is central to all payment transactions. Article 36 of PSD2 requires that AISPs shall provide access to payment account information of the PSU to a third-party payment service provider. As such, PSD2 is a game changer for banks who have been keepers of our financial data[125] since allowing external TPPs to access data is looked at as a radical shift in the banking industry that creates novel and significant security risks and privacy challenges. Banks have serious concerns about losing their trust as well as their reputation due to potential security threats that emanate from the open nature of APIs[126], especially that trust is a critical component in the relationship between banks and customers[127]. There are several examples of the security threats that might emerge in the open banking ecosystem including cyber-attacks, use of data for illegal purposes, and privacy risks due to insufficient security protocols. The openness of the APIs that are widely used by banks further exacerbates security risks, because it makes it easier for cybercriminals to carry out criminal activities such as fraud.[128] API security and management for better monitoring of APIs (including encryption technologies) are, therefore, crucial to protect from attacks and prepare for any corrective actions.[129] Furthermore, relationships with TTPs possibly constitute a significant risk that might endanger banks in the context of numerous types of operational threats. These include but are not limited to information misuse and theft (insider risk), operational and system failures, legal disputes, and challenges faced in the context of compliance with relevant laws and regulations. Several articles in PSD2 aim to protect customers and ensuring secure access to data by TTPs.

- Article 35(1) states that payment service providers should *"… not inhibit access more than is necessary to safeguard against specific risks such as settlement risk, operational risk and business risk and to protect the financial and operational stability of the payment system"*.

- Article 66(3e) states that payment initiation service provider shall "… *not store sensitive payment data of the payment service user*."

- Article 67(2b)[130] states that account information service provider shall *"… ensure that the personalised security credentials of the payment service user are not, with the exception of the user and the issuer of the personalised security credentials, accessible to other parties and that they are transmitted by the payment initiation service provider through safe and efficient channels."*

[125] McKinsey; Palmieri & Nazeraj (2021); Brodsky & Oaks (2017).

[126] Berber & Atabey (2021).

[127] Passi (2018); Berber & Atabey (2021).

[128] Ibid.

[129] Ibid.

[130] Applies also for account information service providers (AISPs).

- Article 67(2e) states that account information service provider shall "… *not request sensitive payment data linked to payment accounts*."

- Article 67(2f) states that account information service provider shall *"… not use, access or store any data for purposes other than for performing the account information service explicitly requested by the payment service user, in accordance with data protection rules."*

The articles along with others under PSD2 stipulate specific responsibilities for payment service providers to implement technical and operational measures for the security of data that are proportionate to security concerns. For instance, security credentials used by PSUs or PSPs for secure authentication (that are issued by the AISP) must be protected to ensure the safety of customer funds and limit the risks of fraud and unauthorized access.[131]

The Regulatory Technical Standards (RTS) developed by the European Banking Authority (EBA) is the technical standard used for Strong Customer Authentication (SCA).[132] SCA is defined as a multi-factor authentication[133] that is based on the use of two or more elements to validate the user or the transaction[134]. It is a key requirement of the EBA, which aims at protecting customers[135] from fraud, securing sensitive data, and helping to build trust in the payment ecosystem, with minimal impact on customer experience.[136] The RTS ensures that data security and consumer protection are guaranteed and satisfies the rules under GDPR by implementing highest standards for cybersecurity and data integrity. There is an important interplay between PSD2 and GDPR in the context of open banking, especially with regard to regulatory ambiguities and inconsistencies that impact practical application and compliance. Both PSD2 and GDPR have robust security measures, and data security is considered a fundamental principle in the processing of personal data.[137] GDPR is an important regulatory framework for customers to have control over their data through consent mechanisms.[138] Since access to customer banking data by TPPs requires explicit consent[139] by the customer, there seems to be an inconsistency between GDPR and PSD2. Berber and Atabey give the following example:

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[131] Berber & Atabey (2021).

[132] Ibid; Polasik et al. (2024).

[133] Multi-factor authentication adds an extra level of security because the vulnerability of one authentication factor will not compromise the security of the second.

[134] Gounari et al. (2024).

[135] Under PSD2 article 97, SCA is a requirement whenever the PSU, individually or via a TPP, access their payment account, initiate any electronic payment process, or engage in an act involving the risk of fraud in payment transactions or potential data misuse in remote access.

[136] Ibid.

[137] See article 5(1f) of GDPR.

[138] Berber & Atabey (2021).

[139] Article 67 on rules on access to and use of account information states that "*the account information service provider shall (a) provide services only where based on the payment service user's explicit consent*."

> *… while Article 94(2) PSD2 requires the 'explicit consent' of the payment service user to process personal data necessary to provide payment services. Yet, on the other hand, Article 6(1)(b) GDPR provides that the processing is lawful itself without having to meet further conditions if and to the extent that it 'is necessary for the performance of a contract to which the data subject is party or to take steps at the request of the data subject before entering into a contract'.*[140]

GDPR also includes core principles about data breach, transparency, and purpose limitation that overlaps with the purpose of using personal data as indicated under article 5 in GDPR. This article sets out that the collection of any personal data is done only for specified, explicit, and legitimate purposes and not further processed in a manner that is incompatible with these purposes. Article 5 is also directly related to the principles of transparency and data minimization, which set out the rules about not allowing access to data than what is necessary, and the customer has consented to.

Article 67(2f) in PSD2, which is stated above, can be regarded as consistent with principles of purpose limitation and data minimization. This is for the reason that AISPs are required not to use the data for purposes other than for performing what is requested by the PSU. In light of these intricate relationships between GDPR and PSD2, there might be a need for further regulatory frameworks[141] to address ambiguities and consistency issues between them to further mitigate security risks, ensure consumer protection, and enable concerned parties to build trust in the market. Open banking is a new arena for payment service innovations and competition, and as such, security and trust are critical components for its success as an emerging banking ecosystem.

3.2 The Platformization of Banking and the Emergence of Open Banking

Platform business models are pervasive in the tech industry. The rapid pace of digitalization and the increased proliferation of digital technologies in various industries is bringing digital platforms and platform strategies in commonly traditional industries such as banking, manufacturing, and government.[142] The enactment of PSD2 and the increased competition by new Fintech startups in the banking industry is pushing banks to invest in new technologies to ensure compliance as well as open up their systems and use APIs to enable the development of customer-centered solutions. This enabled the emergence of so-called open banking.

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[140] Berber & Atabey (2021).

[141] See "Platform Banking as a New Business Model – QuickLook", https://www2.deloitte.com/us/en/pages/financial- services/articles/platform-banking-as-a-new-business-model.html

[142] Schreieck et al. (2024); Berber & Atabey (2021); Cennamo (2021).

Open banking is conceptualized in this report as a platform approach to banking. It refers to banks acting as platform owners and offering resources such as APIs to provide access to customer banking data for external, autonomous third-party complementors and facilitate generative development of customer-centered payment service innovations. Digital platforms are, therefore, major vehicles for the platformization[143] of banking and the transformation of payment services in the retail market[144]. This conceptualization somewhat aligns with the EBA's working group on electronic alternative payments which suggest that open banking is about how banks share their own products like services, functionality, and data, and how they enable customers to share their data and account functionality with third-party Fintech applications in a secure and resilient fashion. More broadly, open banking is described as a special kind of financial ecosystem governed by certain profiles, application interfaces, and guidelines with the objective of improving customer choices and experiences.[145] Schreieck et al. discuss digital platform strategies in the banking industry as providing open APIs that allow third-party developers such as Fintech companies to access customers' banking data to create additional services and apps for them. They describe this process as open banking. Open banking is also described as a collaborative model in which banking data is shared through APIs between two or more unaffiliated parties to deliver enhanced capabilities to the marketplace.[146] Furthermore, as a phenomenon, open banking[147] can be seen as part of the so-called financialization[148] that aim at enhancing competition in the area of payment services for customers and small-medium sized firms[149].

All these descriptions of open banking share three core characteristics: relationships and interactions among different parties including banks, TPPs, and customers, technical infrastructure for enabling data exchange, and offering secure and competitive customer-centered payment service innovations. Radanović suggest that enabling data exchange among the different parties represent a platformization of the banking ecosystem, and can be similar to the transformation in the tourism and transportation industries (AirBnB, Uber) where network externalities are major sources of value. Similar to innovation platforms offered by big tech companies, the availability of open APIs and the accessibility to data are argued to create a fertile

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[143] Alt et al. (2024); Grover & Lyytinen (2022); Zhao et al. (2020); Constantinides (2018).

[144] Radanović (2024).

[145] Kassab, M., and Laplante, P. A. 2022. Open Banking: What It Is, Where It's at, and Where It's Going," in Computer, [55], No. 1.

[146] Berber & Atabey (2021).

[147] Recent research by Juniper market research in 2024 reported that open banking is valued at 57 trillion USD, and that open banking transaction values are expected to exceed 330 billion USD.

[148] Financialization refers to the increasing importance of financial markets, financial motives, financial institutions, financial elites in the operation of the economy. It also describes changing relationships among individuals, firms, and economies in financial markets and the implications of regulations imposed on financial firms. Information Technology is considered an important factor in the development of global financial markets albeit underplayed in financialization literature. Source: Currie, W.L. and Lagoarde-Segot, T., 2017. Financialization and information technology: themes, issues and critical debates–part I. Journal of Information Technology, 32(3), pp.211-217.

[149] Palmieri & Nazeraj (2021).

soil for innovative financial services.[150] Platformization in this environment is characterized by the emergence of business platforms for customer interaction such as multibanking, digital payments (buy now, pay later schemes), investments (crowdinvesting), and alternative financing platforms (crowdlending).

APIs play an important role in the platformization process since banks largely rely on these small pieces of software to enable secure access to banking data. In platform literature, APIs are described as boundary resources, which are software tools and regulations that serve as the interface for the arm's length relationship between the platform owner and the TTP.[151] Traditionally, PISPs and AISPs offered payment services prior to PSD2 through special agreements with banks that hold customers' payment accounts and account information.[152] Radanović explain that this has been a limitation that hindered growth and competition in market. Under PSD2, Fintechs and other external third parties became formally recognized as legal entities with regulated access to account information and payment accounts on an objective, nondiscriminatory and proportionate basis without any contractual agreements[153] with banks[154]. As key information channels, APIs must follow strict RTS developed by the EBA to ensure secure access to data. Banks develop and offer dedicated APIs in order to comply with PSD2 and allow TPPs to access banking data in a secure and reliable way. APIs in this context are made publicly available to all authorized TPPs to use, and no specific agreements are required with banks to use them to develop and offer products and services, which is in fact stipulated in PSD2. It is noteworthy to state that PSD2 sets a minimum for the kind of information that banks are required to provide access for, that is payment accounts, but banks have the possibility to offer more information on savings and loans to create new business opportunities. Radanović argue that banks can respond to PSD2 requirements by mere compliance via basic APIs to maintain market position, but this might be risky for them to fall behind the market competition against agile Fintechs. Thus, APIs can serve as technological solutions to meet mandatory compliance requirements or opportunities to develop better technologies and offer a wide range of services and novel customer experiences.

While platformization and the adoption of platform business models has been rising in the banking industry, the use of APIs alone does not transform banks into platform banking. An interesting distinction is made by Berber and Atabey between open banking and banking-as-a-service (Baas).[155] These two concepts are sometimes conflated, where the distinction between them is that open banking is focused on

[150] Alt, R., Fridgen, G. and Chang, Y., 2024. The future of fintech—Towards ubiquitous financial services. Electronic Markets, 34(1), p.3.

[151] Ghazawneh & Henfridsson (2013).

[152] Gounari et al. (2024).

[153] Article 67(4) states that: "The provision of account information services shall not be dependent on the existence of a contractual relationship between the account information service providers and the account servicing payment service providers for that purpose.".

[154] Radanović (2024): Gounari et al. (2024).

[155] Berbet & Atabey (2021).

data and data access, while Baas is focused on allowing third parties to access bank functionality. They further argue that banks are not platforms, but consumer magnets and their focus is always on matching consumers to their own products and services (i.e., the bank as a sole provider), in contrast to matching consumers with several providers as it is the case in multi-sided platforms.[156] However, PSD2 and the emergence of open banking has been a driver for banks to 'platformize' and engage in platform-like exchanges with external TTPs. Berber and Atabey reflected on this by pointing out to initiatives by banks to develop API platforms and the rise of new competitors:

> *…some large entities have launched developer exchanges or API stores to accelerate a platform-like toolkit building. APItalism will also deliver the long-expected change with BaaS in the form of creating ecosystems. To that extent, banks should re-define and prepare themselves to compete with new players, such as Google and Facebook, who used to be non-competitors on the grounds of low-profit margins.*[157]

According to research by McKinsey, banks are currently in their second era of digitalization.[158] The platformization of banking enabled by PSD2 and represented by the emergence of open banking is part of a broad digital transformation[159] that drives an upgrade of older systems that banks used to deliver payment services. In their research, McKinsey reports on how banks relied on customer call centres and branches to deliver customer services, and then with the introduction of smartphones, they developed digital portals and apps. These digital portals and apps are integrated with existing legacy bank systems, through which they can engage with their customers. With time these technologies became outdated, which in turn created an opportunity for agile Fintech companies to offer more convenient services and disrupt the industry. McKinsey reports that Fintechs came to prominence around 2010 (especially in the area of payments) and have been expanding in almost every area of banking, even in areas often assumed to be safe from threats and competition.[160] For instance, one in two consumers in the US have used a Fintech product in 2021 such as peer-to-peer payment products and non-bank money transfers. McKinsey predicts that Fintechs will grow at roughly three times than the overall banking industry's growth rate between 2022 and 2028. In Europe, within each of the seven largest European economies, at least one Fintech ranks among the top five banking institutions. In response to a survey by McKinsey, customers cited pricing as a top factor for using Fintech products and services along with easy

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[156] Cennamo (2021); Zhao et al. (2020); de Reuver et al. (2018).

[157] Berbet & Atabey (2021).

[158] What is fintech? by McKinsey & Company: https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-fintech#/

[159] Botta et al. (2018).

[160] Fintech which is short of financial technology are companies that rely primarily on technology to conduct fundamental functions provided by financial services affecting how customers store, save, borrow, invest, move, pay and protect money. Fintechs can be startups, banks, non-bank entities, neo banks, and cross-sector firms. Major Fintechs in Europe include Trustly, Volt, Adyen, N26, Klarna. McKinsey estimates that Fintechs will grow at roughly three times the overall banking industry's growth between 2022-2028.

access, speed of service, quality of service, and quality of productive. For example, international transfers via Fintech services would cost only 10 percent of the rate charged by traditional banks. This explains why competition on pricing and margins is likely to intensify as Fintechs gain automated access to customer accounts (and increased transparency) and may through this have leverage on retail customer experiences.[161] It is interesting to note that both pricing and easy access were equally cited (i.e. 32 percent) as top factors for using Fintechs in the survey by McKinsey.

Digital technologies and platforms play a central role in the process of platformization and the eventual growth of Fintechs and shaping the competitive landscape in the financial industry. These technologies include AI, blockchain, cloud technologies, Internet of Things (IoT), open source, and software-as-a-service (Saas). AI in particular, when used in the context of financial data, can significantly transform data processing and service offerings.[162]

The platformization of banking and the emergence of open banking is, as previously discussed, predicted to bring more actors into the payment and retail market including individual payment service users, financial institutions, Fintechs, SMEs, regulatory authorities, and e-commerce platforms. This creates various possibilities for these actors[163], which exemplifies the ideal of network externalities[164] that the value of platform increases as the number of actors increases. Radanović explain that open banking is not a specific product or service but a technological and business framework for developing and providing numerous and different financial services.[165] Table 5 below shows a number of services[166] that are possible with open banking:

Table 5 PSD2 services

Service	Description
Payment initiation services	Initiating payments by TTPs directly on behalf of the customer and with their consent bypassing the need for a traditional payment gateway.
Account aggregation	Aggregating data from multiple accounts to offer accurate and personalized services.
Instant loans and credit scoring	Real-time access of data by TPPs that enables quicker assessment of credit outlooks and faster loan processing.
Automated invoice reconciliation	Automating regular payments and reducing administrative work.
Multibanking platforms	Consolidating accounts of corporations operating in multiple markets from different banks for better monitoring.
Real-time fraud detection	Analyzing transactions in real-time to detect any unusual activity more easily and reducing financial and operating risks.

[161] Botta et al. (2018).

[162] Berber & Atabey (2021).

[163] Radanović (2024); Berber & Atabey (2021).

[164] Radanović (2024).

[165] Ibid.

[166] Ibid.

Additionally, there are several advantages for both banks and Fintechs from open banking. Banks can have better opportunities at meeting customers' needs by offering an end-to-end experience of personalized digital services that banks cannot or do not want to develop, partnering with experienced new Fintech players, and staying agile.[167] It also helps them to optimize existing flows and processes as well as create new sources of revenue.[168] For Fintechs, it helps them to use data and insights to develop innovative services and generate revenues, lowers barriers to access banking data, reduces costs of integrating with legacy bank systems, and facilitates compliance. Nowadays, for instance, payments are increasingly embedded within digital applications and most of these are based on behavioral data often possessed by platform companies to offer personalized services and consumer finance.[169] There is also potential in open banking for financial inclusion for the underbanked population since PSD2 encourages the development of services targeting underbanked groups such as credit assessment and faster loan approvals. This includes less costs for people living on the margins, expanding access to credit, debt rehabilitation, and encouraging healthy financial behavior.[170]

It is important, however, to recognize that open banking also comes with challenges that might impede its potential for innovation and competition. Most banks rely on offering APIs to comply with PSD2 and allow access to banking data. But, as Berber and Atabey argue, the quest for *APItalism* has its own risks and challenges.[171] APIs that are often made publicly available by banks can in most cases be regarded bank property. Actors that use these APIs can face serious consequences for their ability to offer services if they are changed, updated, or even deleted. This can be detrimental for business and, thus, points to data vulnerability concerns and inconsistent quality of services provided by TPPs. Opening APIs also involves security and privacy risks, which can affect trust in banks and the loss of customers. The idea that banking data is accessed by external parties is generally uncomfortable for costumers and can have severe consequences for their trust in banks.

[167] Ibid.

[168] Radanović (2024); Berber & Atabey (2021).

[169] Botta et al. (2018).

[170] Radanović (2024); Plaitakis, A. and Staschen, S., 2020. Open banking: How to design for financial inclusion. Consultative Group to Assist the Poor (CGAP) Working Paper.

[171] Berbwr & Atabey (2021).

4 Platform Competition

4.1 Platform Competition

Platform competition has been popularized by big tech companies such as Apple, Google, Amazon, and Facebook. The introduction of digital platforms such as mobile application marketplaces (e.g. iOS and Android) created a multibillion-dollar industry and a wide range of value sources under completely new conditions of competition. One classic example is the rivalry between the two platform leaders Apple and Google.[172] Despite being rivals, Apple had to rely on Google to offer iPhone users mapping services through their Google Maps app. The two companies compete at a device level but cooperate at service and content levels. Similarly, Apple and Amazon compete at a device level (iPad vs. Kindle) and content level (iBook vs. Kindle Stores), while Amazon offers an app for Apple's iPad. These examples show that the conditions for developing and offering innovations are transformed in digital platforms.[173] The transformation is largely enabled by a shift in product architectures, and the unique nature of digital objects that are reprogrammable and made of homogeneous forms of data.[174] A digitized product, for instance, like an iPad can simultaneously be used as a standalone product and a platform. As a product, one can use it to write emails and browse the web. At the same time, as a platform, it offers external third parties the possibility to use platform resources such as SDKs and APIs and develop service innovations in the form of new apps that contribute into the growth of the platform and expanding its functionality. Cennamo argued:

> *With value shifting increasingly from a standalone product to platform systems, product market boundaries are no longer relevant for defining the type and intensity of competition and identify the relevant competitors.*[175]

A good example of this shift is the demise of Nokia.[176] Nokia was a market leader in the mobile industry, being the first to introduce smart phones. It maintained its market dominance through applying product-based competitive logic, which focuses on individual product attributes and market segments. The entry of platform leaders, such as Apple and Google, in the mobile industry redefined the nature of competition and moved focus into platform products.[177] Nokia eventually failed to compete with platform companies and lost its market dominance. In this kind of

[172] Yoo et al. (2010).

[173] Grover & Lyytinen (2022).

[174] Cennamo (2021); Yoo et al. (2010).

[175] Cennamo (2021).

[176] Cennamo (2021).

[177] Grover & Lyytinen (2022); Cennamo (2021).

environment, the competitive advantage of a firm increasingly depends on *platform competition.*[178] To be competitive is to design digital platforms that inspire and attract external complementors to co-create value through generative development of platform products.[179] Grover and Lyytinen explained platform competition:

> *…as a type of rivalry where two or more organizations strive to fulfill their (partially) nonshareable goals by participating in platform interactions and where such interactions will reduce the value gained directly or indirectly by other parties from such interactions.*[180]

This becomes a contrast to the traditional approaches of competitive strategy[181] where differentiation, market scope, and visibility are considered as the building blocks for gaining competitive advantage. Traditionally, competition is viewed as rivalry between two or more parties pursuing a common goal that cannot be fully shared.[182] It is also defined at the level of product in a given market.[183] Firms engage in competitive practices through offering similar products and targeting similar customers. Competition takes place in well-defined markets that are treated as given; that is, markets are fixed, and firms compete in them to capture the larger value compared to their competitors.

The rapid rise of digital platforms and the eventual platformization of industries, however, have been disruptive to such traditional industrial-era competition ideals. One such example is the economies of scale where firm's competitiveness is achieved through efficient use and control of unique resources to mass produce better market products.[184] In marketing literature, this disruption is characterized by the shift from a goods-dominant logic into a service-dominant logic.[185] The drivers for competition in digital platforms differ from product-market segments.[186] This is illustrated by flexible platform market boundaries spanning across multiple product markets and sectors making them interconnected unlike separated traditional market segments. Platform participants, therefore, work within and across platforms in which rivalry involves cooperation. At the same time, the competitive landscape keeps on changing as market boundaries are constantly changed and blurred. Platform products are, as earlier described, both developed and offered across multiple platforms or multi-sided markets. Actors in these platforms, including platform owners and other third-parties, engage in a process of value co-creation where each

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[178] Cennamo (2021); de Reuver et al. (2018).

[179] Mansour & Ghazawneh (2023).

[180] Grover & Lyytinen (2022)

[181] Porter, M.E. (1980). Industry structure and competitive strategy: Keys to profitability. *Financial analysts journal*, 36(4), pp. 30-41.

[182] Grover & Lyytinen (2022).

[183] Grover & Lyytinen (2022); Cennamo (2021).

[184] Grover & Lyytinen (2022); Cennamo (2021); de Reuver et al. (2018).

[185] Vargo, S.L. and Lusch, R.F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68(1), pp.1-17.

[186] Cennamo (2021); Yoo et al. (2010).

party takes a bit, rather than one controlling a larger share.[187] Both the interconnectedness of platform markets and the focus on value co-creation demonstrate the changing nature of competition.

4.2 New Conditions of Competition in the Open Banking Market

One major rule in PSD2 is access to account information so-called XS2A or the right to access. Access to account information is the cornerstone of PSD2 and open banking. This rule is viewed as a major development in lowering entry barriers to new non-bank entities, such as Fintech startups, that can contribute into developing payment service innovations and strengthen competition in the retail financial market.[188] Palmieri and Nazeraj explained that such access is a pre-requirement for competition on an equal basis between external TPPs and incumbent banks. Banks has traditionally accumulated massive amounts of data about customer banking transactions, which is never accessible outside their boundaries, especially not by potential competitors. Access to data within open banking platforms changes this by 'leveling the playing field' with banks, given that external TPPs can use the data and leverage it to offer competing payment services that are cheaper, faster, and more convenient.[189] This makes it much easier for platform companies (e.g., Trustly, Klarna, Kivra) to compete with traditional banks in areas such as better pricing and speed of service. Due to this competitive behavior by TTPs, banks are faced with a potential erosion of transaction volume, revenues, and customer loyalty.[190]

PSD2, however, includes provisions that allow banks to refuse granting access to data that is deemed unnecessary for the provision of payment services or sensitive due to security and intellectual property concerns.[191] Such concerns surrounding PSD2 have led to the emergence of new competitive conditions and dynamics in open banking, which might even extend beyond its original aim of fostering competitive development of payment service innovations. For instance, security and privacy concerns as well as consumer data protection maybe overlooked because of the excessive focus on the competitiveness of the business environment.[192] As external TPPs get access to banking data, they can further enhance their competitive edge by focusing on developing offerings with enhanced data security and privacy. This opens new venues of competition centered on technological expertise in developing payment services that are not only attractive and personalized but also technologically secure, particularly as emerging market players strive to earn customers'

[187] Cennamo (2021); de Reuver et al. (2018).

[188] Palmieri & Nazeraj (2021); Ozcan & Zachariadis (2021); Cortet et al. (2016).

[189] He et al. (2023); Palmieri & Nazeraj (2021); Botta et al. (2018).

[190] Botta et al. (2018).

[191] Palmieri & Nazeraj, 2021; Borgogno, O. and Colangelo, G., 2020. The data sharing paradox: BigTechs in finance. *European Competition Journal*, 16(2-3), pp.492-511.

[192] Borgogno & Colangelo (2020); Stiefmueller, C.M., 2020. Open banking and PSD 2: the promise of transforming banking by 'empowering customers'. In Advances in the Human Side of Service Engineering: *Proceedings of the AHFE 2020 Virtual Conference on The Human Side of Service Engineering*, pp. 299-305.

trust.[193] Fintechs, that are more agile and technologically advanced[194], are already posing a threat to traditional banks which are often burdened by complex legal regulations and slow response to rapid technological change. While banks attempt to compete with Fintechs as technological innovators, banks are faced with a more serious threat by big tech companies.[195] PSD2s regulatory role to encourage competition and "level the playing field", can also create openings for incumbent technology firms – big tech – with the unintended consequence of crowding out start-ups.[196] Big tech platform companies are different from Fintechs.[197] Big tech enjoys a large installed base, established reputations, powerful brands, considerable capital, and control over consumer behavior.[198] They also possess vast stores of behavioral data and great skills in combining sophisticated tools, such as AI and machine learning, to collect and process data. Palmieri and Nazeraj explain:

> *…the right to access will likely increase competition and contestability of banking markets as well as consumer welfare in terms of diversified products and services, lower transaction costs, and price reduction. However, in the long term, the access to account rule may lead to monopolization by BigTech companies…*[199]

Both banks, and also Fintechs, maybe in this situation at a competitive disadvantage especially that access to data by big tech limits or even eliminates the advantage of traditional banks. As potential major new players in the open banking environment, big tech companies may act both as intermediaries and marketplaces.[200] As intermediaries, these new players may offer new services by bundling their service offerings with traditional banking products. For example, this can be offering cheap credit to customers who subscribe to their online advertising services or make payments on their platforms; something that banks and Fintechs cannot replicate due to narrower product portfolios. In this case, big tech may engage in anti-competitive practices by discriminating against incumbent banks in favor of their subscribers and privileging their products and services.[201] As marketplaces, big tech will enjoy network effects by connecting banks and borrowers that may lead to winner-take-all monopolistic position where a few platform players dominate an industry.[202]

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[193] Bijlsma, M., van der Cruijsen, C. and Jonker, N., 2023. Consumer willingness to share payments data: trust for sale?. *Journal of Financial Services Research*, 64(1), pp. 41-80.

[194] Botta et al. (2018).

[195] Gawer (2022); Berber & Atabey (2021); Borgogno & Colangelo (2020); Botta et al., (2018).

[196] Constantinides et al. (2021).

[197] Borgogno & Colangelo (2020).

[198] Padilla (2020); Constantinides et al. (2021).

[199] Palmieri and Nazeraj (2021).

[200] Padilla (2020); He et al. (2023).

[201] Borgogno & Colangelo, (2020); Constantinides et al. (2021); Gawer (2022).

[202] Gawer (2022); Bonina et al. (2021).

The narrowing of bank offerings may push some customers to conduct business with big tech platforms. In such a situation, the banks might need to join these platforms for a fee in order to compete for customer touch points and reach out to potential customers in the platform.[203] In other words, for the banks to stay competitive, they may need to partner with Fintechs and other big tech companies where they act as orchestrators.[204] At the same time, this creates a dilemma for the banks as they can risk to fall behind technologically if they don't partner up with the new players, or lose control over costs and customer data if they do. In either case, it can be challenging to offer competitive and differentiated services that in turn leads to significant losses in market. Padilla offers a prediction:

> *Whether Big Tech entry ends up fostering competition in retail banking in the medium and long term is at best uncertain. It will depend, among other things, on the ability of traditional banks to ring fence their loyal and highly profitable customer bases, exploit their informational advantages and reputation regarding data protection, and/or bundle products with the current accounts of their customers. If they manage to do so, they might be able to stop people from shifting away to the Big Techs. The competitive effect of the entry of Big Tech firms will also depend on how regulation treats these new entities in absolute terms but also in relation to existing banks.*[205]

The new players whether Fintechs or big tech platform companies will have to gain the trust of customers and address their privacy and security concerns, as they might not be willing to offer consent for accessing their data and accounts to 'unknown non-bank insurgents'.[206] Traditional banks in this context do hold the keys to the vault in terms of trusted customer relationships, where trust is a prerequisite for the provision of payment services.[207] It is uncertain if banks can maintain their trusted agent status in the market as new competitors with innovative technologies and platform business models continue to emerge.[208] While PSD2 aims in principle to empower customers in the retail market, these competitive dynamics between banks, Fintechs and big tech companies demonstrate a potentially turbulent competitive landscape in the banking industry due to shifting powers. For instance, there are concerns whether PSD2 is sufficient to mitigate problems for competition given the hegemonic powers of traditional banks.[209] The right to access in PSD2 enables Fintechs to compete with traditional banks and alter their market position. At the same time, while big tech companies may leverage their "technological prowess" to expand market share in the banking industry, the traditional hegemony of banks is not necessarily disrupted but instead shifts towards emerging big tech players. This raises more concerns about customers' control over data, the

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[203] Padilla (2020); Botta et al. (2018).

[204] Mansour & Ghazawneh (2023); Botta et al. (2018).

[205] Padilla (2020).

[206] Botta et al. (2018); Brodsky & Oakes (2017).

[207] Palmieri & Nazeraj (2021); Brodsky & Oakes (2017).

[208] Botta et al. (2018).

[209] Padilla (2020).

consent rule in PSD2, and the prospect of empowering them.[210] If big tech turns out to be the 'new hegemonic bank', customers may be at risk of getting exposed as big tech companies has the technological infrastructure and expertise to exert control over their data and behavior. In this case, Stiefmueller suggested that,

> *Government and regulators need to strike a balance between protecting citizens' ownership of their personal data – including their freedom to make use of it as they see fit, and protecting citizens from being forced into unequal exchanges where surrendering data is a pre-condition for accessing 'essential' services.*[211]

Gawer argues that big tech companies accumulated massive power in the digital economy that requires not only enforcing existing laws, but also a serious consideration of regulatory changes in Europe and across the world.[212] The technological imbalance between banks, Fintechs, and the big tech along with customer's potential vulnerability may suggest that PSD2 is not automatically pro-competition, and navigating competitive conditions and relationships in open banking requires more regulatory structures that cope with technological advancements.

[210] He et al. (2023); Padilla (2020); Stiefmueller (2020).

[211] Stiefmueller (2020).

[212] Gawer (2022).

5 Research methodology

5.1 A Qualitative Investigation of Open Banking in Sweden

This report is based on an empirical investigation of the Swedish open banking market. It adopts a qualitative research methodology that emphasizes an understanding of the empirical phenomenon, which is rooted in the research participants' experiences and subjective perspectives of open banking. A primary motivation for adopting a qualitative research methodology is its capacity to provide tools to investigate and explore novel and emerging phenomena such as open banking.[213] The report uses a number of qualitative data collection methods, primarily interviews that are effective in generating rich data.[214] The ambition in this report was to collect such rich data, which is known to be a critical feature in lending credibility and persuasive strength to qualitative investigations. The richness of the data sought throughout the investigation is characterized by deep nuanced descriptions of events that help in generating meaningful interpretations that are fundamental for conceptual development and theorization.

It is important to stress that the novelty of open banking as a phenomenon emanates from two issues: open banking is still an emerging phenomenon, and major actors, whether incumbent banks or Fintechs, are still exploring the market (see chapters 6 and 7 in the report). In other words, it is not a fully mature market for several actors, particularly customers. The continuous evolution of regulations highlights the market's ongoing development and lack of full maturity, indicating that conditions for competition and innovation are still taking shape. For instance, the upcoming PSD3, Payment Service Regulator (PSR), and other regulatory frameworks mainly the Framework for Financial Data Access (FiDA) for open finance are set to expand the scope of open banking. The other issue, which is closely related to the current state of open banking market, is that the literature on open banking is scarce, and the majority of available studies are largely published by practitioners and regulatory bodies. The study of such a novel phenomenon in the banking industry, therefore, requires research methods that allow exploration of nuanced experiences and deep insights. This in turn positions qualitative research methods as the best choice for investigating open banking.

[213] Recker, J., 2021. Scientific research in information systems: a beginner's guide. Springer Nature; Patton, M.Q., 2014. Qualitative research & evaluation methods: Integrating theory and practice. Sage publications.

[214] Schultze, U. and Avital, M., 2011. Designing interviews to generate rich data for information systems research. *Information and organization*, 21(1), pp.1–16.

5.2 The context of investigation and participant selection

The main context of this report is the Swedish open banking market. This report uses various qualitative research methods to investigate perspectives and experiences of major actors in the open banking market in a Swedish context. In the past 10 years, the Swedish open banking market has been growing rapidly. The Fintech sector, which is a major player in the open banking market, is currently ranked fourth in Europe and tenth globally.[215] According to reports by Finansinspektionen on open finance, and the Riksbank on the financial market in Sweden, the growth in the Swedish Fintech sector is attributed to the advanced digital infrastructure and the widespread use of digital IDs.[216] These are primary factors for why Swedish Fintechs are early adopters of open banking. Finansinspektionen also indicates, in their report, that between 100-150 million payments were made through regulated digital payment initiation from customers' payment accounts during 2023. SweFintech, the association of Fintech companies in Sweden, stated in their 2025-report that PSD2 is ranked third (36 percent) among regulations with the most impact on business.[217] It comes after AML/CFT regulations aimed at preventing money laundering which is the most impactful regulation (67 percent), followed by GDPR and information security equally ranked second (59 percent). Banks in Sweden have also been frontrunners in PSD2 compliance and the introduction of developer portals and APIs. The Swedish market of open banking, therefore, represents a unique context for contributing novel insights into new competition dynamics, market entry dynamics, and the development of an innovative ecosystem of financial services.

To prepare for this report, purposeful sampling[218] was used to select research participants. The focus of the sampling process was on identifying major actors in the open banking market. Research participants have, therefore, been selected to be representatives of the Fintech sector, banks, supervisory authorities, and industrial associations. All these actors play major roles in open banking and are, thus, purposefully selected for the current investigation. The selection of these actors was guided by the objectives of this research report—specifically, to examine perspectives on competition, as well as the entry barriers and opportunities within the open banking market. Banks and Fintechs are key players in driving financial innovations in the market, while supervisors monitor compliance, and professional associations strive to influence policy and regulations to maintain a well-functioning market.

Since the data used in this report was collected over two rounds of data collection – early 2023 and late 2024/early 2025 – participant selection followed a different

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[215] The Riksbank. Den svenska finansmarknaden: https://www.riksbank.se/sv/press-och-publicerat/publikationer/staff-memo/en-oversikt-over-fintech-och kryptotillgangar/vad-ar-fintech/

[216] The Riksbank, Den svenska finansmarknaden: https://www.riksbank.se/sv/press-och-publicerat/publikationer/staff-memo/en-oversikt-over-fintech-och kryptotillgangar/vad-ar-fintech/; Finansinspektionen. Open finance in Sweden. *Report, 2023-06-28*. https://www.fi.se/en/published/reports/reports/2023/open-finance-in-sweden/

[217] SweFintech (2025). Fintechrapporten: nya utsikter för fintechbranschen.

[218] Patton (2015).

purposeful sampling process. In the first round of data collection[219], the focus was on banks, and direct messages were sent to public email addresses shown on API developer portals with a request to meet people working with open banking. Once a contact was identified, snowball sampling was used to further identify other participants. A total of 6 participants were identified in the first round. In the second round that began in October 2024, a similar process was initiated by contacting banks directly via developer portals or looking into public information like press releases, reports, brochures, tech blogs, and national news about open banking where potential participants could be found. During this time, a connection was also established with SweFintech, an industrial organization focused on Swedish Fintechs, which was helpful in sharing contact information for Fintechs operating in the market. Invitations for participation in the research were sent out by email to various potential contacts from banks and Fintechs. The invitations included the objective of the research along with other practical and ethical information. All invited people agreed to participate in the report. The total number of research participants representing banks and Fintechs was 12. Table 6 below shows a summary of all research participants outlined by their professional roles and associations.

Table 6 Summary of Research Participants

No.	Participant	Role	Organization size
1	Banker	Open Banking Community Manager (OBCM)	Large bank
2	Banker	API developer (API developer)	Large bank
3	Banker	Head of Open Banking (HOB)	Large bank
4	Banker	Chief Product Manager (CPM) – Open Banking	Large bank
5	Data Aggregator	Head of Industry and Wallets, Open Banking Expert (HIW)	Large Fintech
6	Data Aggregator	Head of Legal Banking (HLB)	Large Fintech
7	Banker	Legal Payment Counselor (LPC)	Small Fintech
8	Bank association representative	Senior Advisor (SDA) Digitalization and Financial Infrastructure	Association (Sweden)
9	Fintech professional	Industry Expert (IE)	Large Fintech
10	Fintech professional(s)	Various roles, 4 focus group participants	Small and large Fintechs, Association (Sweden)
11	Data aggregator	Consumer Engagement Manager (CEM)	Large Fintech
12	Banker	Fintech Expert (FE)	Large bank
13	Fintech association representative	Executive Fintech Advisor (EFA)	Association (EU)
14	Fintech professional	Head of Compliance (HOC)	Small Fintech
15	Fintech professional	Chief Commercial Officer (CCO)	Small Fintech
16	Fintech professional	Regulatory Manager (RM)	Small Fintech

[219] The author of the report had been conducting research on open banking before being contracted by the Swedish Competition Authority. This report draws on both empirical data gathered prior to the assignment (first round) and new data collected afterwards (second round).

5.2.1 Interviewing as the primary data collection method

After the research participants were identified and agreed to meet for a discussion on open banking, interviews were planned. The qualitative interview was used as the primary data collection method. Interviews are known to be the most effective qualitative research methods[220] that are frequently used to explore new phenomena such as open banking. A key distinguishing feature of qualitative interviews is the direct engagement in conversations with the research participants in order to generate "*deeply contextual, nuanced, and authentic accounts*"[221] about their experiences and how they interpret them. Since the objective in this report is to investigate open banking, which is regarded as a phenomenon of an exploratory nature, grounding the interview in the participants' own experiences was critical to obtain such accounts. To ground the interview means that the conversation is anchored in actual experiences, events, and settings where the research participants work. The recounting of experiences by the research participants is one way to do such grounding, which allows the researcher to draw a mental image of the participants' different experiences. The scarcity of literature on open banking, for instance, makes participants' accounts of their experiences a definitive source for understanding what it is and how it works. Each interview served as a learning experience, with every participant sharing their unique perspectives of PSD2 and open banking. It was also enlightening for the research participants to participate as they had the opportunity to construct their personal narratives about open banking, and perhaps assess its plausibility with regard to their view of the phenomenon as a catalyst for innovation and competition. During the interviews, questions were asked about areas like Fintech and bank relationships that prompted participants to share varying experiences (especially when looked at from the different angles of banks, Fintechs, and other actors). Generally, the interviews were effective in finding out and connecting the dots among the different perspectives and highlighting common areas that have not yet matured or developed in the market like branding Fintech services.

As stated earlier, a first round of data collection commenced in early 2023. Six interviews were conducted mostly with participants from a large bank in Sweden. The interviewees had different roles and backgrounds in open banking. All six interviews were conducted through Zoom and video recorded after obtaining permission from each individual interviewee before the start of the interview. As a research standard practice, the opening of the interview was focused on reminding the interviewee about the purpose of the research and how the collected data will be used and for what purpose. It also highlighted ethical issues mainly the rights of the participants for confidentiality and anonymity, that the researcher is the sole responsible for the data, and that the participants have the chance to look into how the data is later used in the report. These ethical issues were also communicated via email and each individual participant was asked to confirm that they fully understand and agree with them. All participants had also the possibility also to add any

[220] Schultze & Avital (2011).

comments or requests as they reply to the email such as wanting to see how they are quoted in any published work, which is a good practice to ensure the validity of the data. An interview protocol was used to guide the conversation between the researcher and the research participants. This protocol contained questions organized under major themes such as PSD2 as a bank regulation, open banking and access to data, bank and Fintech relationships, competition and innovation, and entry barriers and opportunities. It was developed based on the extensive review of literature presented in this report, which was instrumental in identifying and developing the major themes that address the main focus of this report. The format of the interview was semi-structured[222] and the protocol was used to guide rather than limit the conversation. Much of the discussion was driven by issues raised during the conversation, which largely lie within the themes available in the protocol. This style of interviewing is quite useful in enabling a dynamic conversation that allows for novel issues to emerge that is fitting to investigate the exploratory nature of open banking. The average time of the interview ranged from 45 to 60 minutes.

During the second round, a similar process of interviewing was implemented. A total of 12 interviews were conducted via Zoom or Teams between October 2024 and February 2025. The participants were representatives of both banks and Fintechs with diverse experiences in open banking. The average interviewing time was also between 45 to 60 minutes. All interviews in this round were recorded as well for later transcription. It is worth noting that follow-up interviews were conducted during this round with two participants to further investigate their experiences and supplement the earlier discussion with additional insights. After the completion of all the interviews, an AI-transcription tool was used to transcribe the interviews verbatim. The use of this tool was effective in completing the time-consuming task of transcribing a large number of interviews and saving time to focus on important aspects of the research. The interview transcripts were then prepared for data analysis, which is discussed in detail in section 5.3 below.

The interviewing process follows common ethical principles of maintaining the confidentiality and anonymity of research participants, ensuring their voluntary participation, avoiding harm and doing good, and securely protecting the collected data. As stated earlier, these key principles and others were communicated to participants via email, and they were asked to confirm that they had read and agreed to them. The participants' identities in this report have been anonymized. In chapter 6, all quotes from the interviews are attributed to participants by their professional roles, as shown in Table 6 above, with no explicitly identifiable information disclosed. A number of participants, in their reply to the email containing the ethical principles, requested to see how they are quoted. These participants were contacted individually and given the opportunity to review their quotes and make any necessary changes prior to the final publication of the report.

[222] Patton (2015).

5.2.2 The focus group

During the second round of data collection, a focus group, or a group interview[223] was conducted with the Payment Group at SweFintech. The group included representatives from the Fintech sector and four participants joined in the discussion. The focus group was planned to last an hour over Zoom. The group also included a representative from SweFintech who shared insights into the current state of the Fintech sector with regard to technical, regulatory, and competitive issues in the market. The aim was to engage with various experts from different Fintechs to explore their collective views on open banking. Another aim with the focus group was to observe how they react to it as a group during the conversation in order to supplement the data collected through one-to-one interviews.

5.2.3 Additional sources of data

Document analysis was applied as an additional source of data in this report. Several reports from government authorities such as the Riksbank, Finansinspektionen, the European Commission were analyzed to get insights into the state of the market on open banking. Reports from industrial associations such as the Swedish Fintech Association (SweFintech)[224], and a European-level organization called the European Third Party Providers Association (ETTPA)[225] that represents the interests of bank-independent TPPs, were also included as sources for this report. These kinds of reports often include statistics about the number of major players and services indicating growth levels, challenges and opportunities facing the market, and regulatory assessments that offer a broad overview of the market. More precisely, they were useful in describing the context of the investigation and obtain additional insights into issues from government, industrial, regulatory, and TPP perspectives.

5.3 Analyzing the empirical data

The framework for analysis used to analyze the data in this research is thematic analysis as proposed by Clarke and Braun.[226] It combines both induction and deduction, referred to as analytic induction[227], through which data is analyzed deductively with key theoretical constructs in mind, while at the same time maintaining room for themes to emerge inductively by "letting the data speak". The use of analytic induction in this report is justified by the scarcity of literature on the subject of open banking and competition, i.e. its novel nature as a phenomenon for research.

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[223] Patton (2015).

[224] See https://www.swefintech.se

[225] See https://www.etppa.org

[226] Clarke, V. and Braun, V. (2017). Thematic analysis. The journal of positive psychology, 12(3), pp.297-298.

[227] Patton (2015).

The transcription of interviews into text was done using a specialized AI-transcription tool. This proved effective in avoiding the time-consuming task of manual transcription and aiding the analysis process by allowing the researcher to focus on interpretation rather than text transcription. The AI tool was also effective in supporting the analysis process itself since reading and familiarizing with the text was aided by colorful highlights showing the exact spoken text instantly. While reading the transcribed text, it was also possible to listen to the conversation simultaneously by following highlighted text that matches the text with voice. Reading and familiarizing oneself with the text is a key step in Clarke and Braun's thematic analysis, and using the AI tool in this process was instrumental both in interpreting the text and also ensuring that nuances were captured. The possibility for simultaneous reading and listening to the interviews elevated the quality of the analysis, since data analysts would usually transcribe the text and then read it to make interpretations from a static document. The transcript, generated by transforming audio into text, was dynamic allowing for real-time analysis of the data. This tool also enabled dynamic navigation through the transcript. While reading, interpreting, and making sense of the text, themes could be identified and constructs developed in association with specific segments of the data. The AI tool was helpful to make such associations as it made it easier and much faster to navigate through different themes and constructions, which further supported the analysis process.

The process described here for analyzing the data was applied to all transcripts twice over in the analysis process. This means that each transcript was read and analyzed two times. Key themes and data segments (i.e. raw interview quotes) from each individual transcript were then compiled into tables to facilitate access to important observations in the data and enable the identification of key insights into open banking. After that these insights were used to present and outline the main findings in the report.

6 Findings

6.1 Bank and Fintech Perspectives on Open Banking

The findings show clear differences in perspectives on PSD2 and open banking between incumbent banks and third-party providers (TPPs). On one hand, banks acknowledge the potential benefits of allowing new entrants into the market such as increased innovation and improved outcomes for customers and society. However, they remain reluctant to open up what they perceive as their proprietary data vaults to external entities whom they often view as competitors. On the other hand, TPPs generally view PSD2 as a positive regulatory development that facilitates greater market participation and the development of competitive products and services by lowering entry barriers. Nevertheless, they also recognize that the regulation's implementation has been inconsistent, and significant challenges remain to fully leverage data access. These perspectives were particularly dominant in the early stages of PSD2 introduction. As the market continues to mature, both banks and TPPs are gradually adopting pragmatic approaches toward PSD2, while concerns remain - especially regarding competitive dynamics, power asymmetry, and technological development. A primary concern for both banks and TPPs is the development of compliant APIs and their quality in enabling reliable data access by TPPs. A Legal Payment Counselor (LPC) at a large bank noted that banks often make substantial investments in PSD2 without seeing any direct returns. This sentiment was echoed by several other bankers interviewed during the investigation. She explained:

> *…it is a lot of technical development that is required that you don't really get paid for. So that is something where you are in between the regulatory requirement and, on the other hand, like making business and earning money from what you are actually putting time and effort into…*

Chief Product Manager (CPM) and Subject Matter Expert on PSD2 at a large bank who oversees API development believes that none of the banks initially welcomed PSD2. He explains that PSD2 enforced a reality where banks had to 'share' data with unknown vendors and the "bank is safe" ideal suddenly becomes subject to scrutiny in the market. He perceives PSD2 as a reality that has to be dealt with. Similarly, a Fintech Expert (FE) at another large bank, argues that PSD2 is not merely a regulation to comply with as it also creates new types of relationships that banks are not accustomed to deal with. This adds, according to him, further complexity to adapt and leverage any potential opportunities. He said:

> *I would say that what is troublesome in the organization is that some of these new types of services and new typed of relationships that open up, it is not the traditional bank-customer relationship. It used to be like, you know, from business to business, if it is a business customer, or business to customer if it is a retail customer. However, now it is with open finance and introduction of*

these intermediaries, PSPs, etc., it is business to business to customers, or business to business to business, basically depending on the customer. It is one step away through some other types of intermediaries that is sort of consuming the data. We are not used to handling those kinds of relationships.

He also shares his view about the potential lack of transparency and control in market due to these emerging relationships since TPPs can have access to data and use it for purposes outside the control of incumbent banks. He further explained:

…we are also worried about not serious TPPs going to the Swedish market as sort of payment hub for betting and gaming, not being serious actors sending money to places we don't sort of really have any transparency like we used to when they were using our interfaces.

PSD2 allows TPPs to access data and offer services in two key areas: Payment Initiation Services (PIS) and Account Information Services (AIS). However, prior to PSD2, TPPs were able to access data and offer such services using unregulated methods such as so-called screen scraping and reverse engineering. The use of these methods depends on accessing customer bank accounts using an interface software where users can add their login credentials to access their online bank. Some banks resisted the use of such methods due to alleged security concerns, which meant that data access was not guaranteed unlike the mandated data access under PSD2. This was a major obstacle faced by TPPs in the market. An Industry Expert (IE) at a Fintech, discussed the obstructions Fintechs faced as they engaged in data access services prior to PSD2. He explained how banks may have perceived this as competition since they make interchange fees from card payments. For instance, some banks, although not in Sweden, used to contact customers and ask them not to use these services and even revoke their user credentials. They also took measures such as blocking TPPs' IP addresses to prevent them from establishing connections with the bank's systems. They perceived this as a security threat and demanded that third parties ask for approvals from them. In such cases, both TPPs and customers were placed at a disadvantage, as TPPs were unable to offer services and customers could not benefit from services outside the scope of their own bank channels. The IE weighed in on how PSD2 helped TPPs to overcome these obstacles:

So, when PSD2 was concluded; we were of the opinion that the legal text, you know, PSD2 text was well balanced, well considered, and it would finally open up and make it easier to provide kind of service, but also to stop the obstructions from banks …

Despite the removal of certain obstacles under PSD2—discussed further in the section on competition perspectives below—the IE highlights additional barriers related to banks' compliance with PSD2, which continue to hinder TPPs from fully leveraging the potential of open banking. There are also other types of TPPs who are primarily driven by customer needs than the pursuit of financial service innovation through data access. For instance, the Head of Compliance (HOC) at a small Fintech

startup that offers credit services and payment solutions, explained that her company is unwilling to develop services that would require large investments while customers are not really asking for such services. She stated:

> *…most of our development is driven by the merchants and their needs. If they come to us and say that they have a new functionality they want to offer their consumers, then that's always something we prioritize. Because we can spend millions to develop a lot of features, but if no one wants them or unwilling to pay for them, then it's not really …beneficial…*

An additional insight by a Regulatory Manager (RM) at a small Fintech specialized in bookkeeping indicates a different kind of barrier for TPPs. She argues that getting through the process of becoming a licensed TPP is not straightforward, because it requires the company to be something they do not really want to be. She explained that the scope of PSD2 can be broad for them as a company, but they are not really interested in acting on all the provisions in the regulation or buying the whole license package which would require the company to pay extra money for licenses that they will not use.

6.1.1 Fintech-Bank Relationships

During the investigation an attempt was made to explore the emergent relationships between banks and TPPs. The goal was to understand how each actor connects with the other and whether there are any strategies behind partnering with banks or Fintechs. The FE at a large bank explained that, following PSD2, Fintechs have been increasingly reaching out to banks as they explore opportunities to offer and sell their services. Although the relationship may appear mutual, it is usually Fintechs that initiate partnerships with banks, largely due to the banks' dominant market share. He explained:

> *I think they are standing in line outside in order to partner with us. Okay, because they all look for opportunities to sell their services. I mean, the bank has millions of customers in the market, so I think it's a great opportunity for them… then, of course, … it's not always that they knock on our door. Sometimes we knock on their door as well, because we read some report, or we see a presentation in a conference… we ask them to introduce the services to us.*

An interesting observation emerged from the data, where professionals from both Fintechs and Fintech industry associations emphasized the need for initiatives beyond PSD2. They suggested that such schemes would facilitate collaboration between banks and Fintechs in the mutual development of service innovations. The IE shared an insight into this:

> *PSD2 sets a baseline for what APIs should look like. But then there could be additional functionalities that Fintechs want from banks. These functionalities would then be subject to an additional conversation between Fintechs and banks.*

The IE wants to see collaboration in areas that might not be covered by PSD2. It could also be areas where PSD2 is a starting point for further collaboration and partnership with incumbent banks. The investigation identified collaboration schemes or frameworks as key drivers for market entry by TPPs. These frameworks help overcome regulatory and technological limitations under PSD2, while also addressing the competitive concerns of banks, who feel that PSD2 offers no direct benefit to them. An Executive Advisor (EFA) and Fintech expert from a European association representing TPPs, explained how such schemes might work on top of PSD2 by saying:

> *…a scheme that we've developed together with banks, on top of PSD, is to use all the PSD2 infrastructure, getting some extra services, and then paying the bank for it. So, in this scheme, they will also get a payment, similar to if they joined certain collaboration schemes. So, let's say a PIS without interchange fee. It exists. But it has never been working overly well and so therefore going forward, we're looking at this collaboration of, rather paying banks something in some interchange equivalent, so that the whole thing will work properly anyway.*

In the discussion of competition perspectives below, there is a common theme about potential gain by banks from PSD2 and open banking, and such schemes, which are not covered by PSD2, can be one way to establish better engagement between banks and Fintechs. The HOC at a small Fintech explained that her company is a credit institution, and their licenses sometimes do not allow them to offer certain services so that is a business case for them to collaborate and share the profit. She said:

> *If there's a company doing something really well, then it's easier to collaborate with them and to share the profit, so to speak, than to build it yourself. Some cases it's also regulatory that there are like, we are not a bank, we are a credit market company. So, there are some types of services that we cannot offer under our license, but that banks can offer. So, then you sort of have to collaborate.*

The open banking market is also benefiting from Fintechs that act as data aggregators which aim to facilitate data access and leverage as well as create connections among different parties. Tink, which is one of the largest Fintechs in Europe, is an example of a company that plays an important role in connecting banks with TPPs and customers and saving them the time and money to invest in infrastructure and build technology for these purposes. A Consumer Engagement Manager (CEM) at a large data aggregator, explains the role of his company in creating connections among Fintechs, banks, and customers as follows:

…we gather transactional data through open banking, through PSD2 connections, and then we add value on top of these transactions. Basically, what we do is that we clean the data, we categorize the data, we understand what the transactions are, then we can build insights on top of this … So, typically, it's about productifying what open banking data can generate in terms of value … instead of building everything themselves (banks and Fintechs), they can just license our technology and use it…

Banks argue that building PSD2 compliant infrastructure is costly and this diverts resources from developing profitable services. Data aggregators such as Tink help mitigate these challenges by simplifying compliance and facilitating connections with other market actors. Bankers interviewed in this investigation noted existing collaborations with Tink, highlighting that approximately 6,000 financial institutions currently use its services. An interesting observation about the role of Tink as data aggregator and intermediary platform is the idea of using open APIs where different parties could exchange data without the need of any formal agreements or partnerships. The CEM further added:

This is basically an open technology, right? So, there is no need for a formal partnership. So, say that you are a Fintech company and would like to access the data that is stored in, say, an incumbent bank. We provide that service to our customer, the Fintech company or the bank or the financial service provider, and through our technology, we can enable them to build new user experience, etc., but we don't provide any like direct relationship between the Fintech and the bank, right? The bank has its APIs. It's open APIs and since we are licensed, we can access those APIs and let end users share that their financial information…

6.2 PSD2 and Challenges and Opportunities for Open Banking

6.2.1 APIs for data access

All Fintech professionals interviewed during the investigation share a common view that APIs, which are the main and only channel used by banks for providing access to data, are problematic because they are designed poorly. They pointed out several issues with APIs, including slow performance, multi-step processes, limited functionality, and a more complicated login experience compared to accessing the bank's customer interface directly. For instance, while the IE believes that the adoption of PSD2 has helped to remove many bank barriers, access to customer bank accounts is still limited to APIs which are not always reliable. TPPs are also required to reintegrate with banks indicating that further work is needed to facilitate data interoperability. APIs are perceived here as a 'blessing in disguise'. He explained:

…PSD2 was actually and still is agnostic in terms of the PIS, initiating payment, through an API or through a customer interface…

According to the IE, the EBA issued an opinion about the problems with APIs, but these were not enough to mitigate the problems. On one hand, he suggests that overcoming API agnosticism could be achieved through allowing TPPs to access the same data interfaces used by bank customers such as the customer APIs in mobile banking rather than restricting access solely to compliance APIs. Banks are, on the other hand, hesitant to offer access to data by other means other than compliance APIs particularly not through customer interfaces for mainly competitive reasons. In order to address TPPs' concerns about APIs, the CPM at a large bank explains what his bank is doing to ensure better access to data, he said:

> *…we are trying to see and optimize our APIs and our endpoints and the instructions to PSPs, how they should use our APIs in order to sort of somewhat limit the number, not limit the information they can retrieve, but limit the number of calls that they make unnecessarily.*

However, it is likely that banks view APIs not only as a means of compliance but also as a way to maintain control over data access and protect their "business edge". The LPC at a large bank explained the dilemma faced by banks, which are required to comply with PSD2 by developing reliable infrastructure—APIs—but are not compelled to go beyond this, as they see no direct benefit beyond mere compliance. She said:

> *…it requires a lot of work and technical development. And you know, there are quite high requirements regarding up time and that the customer interface and the API should work the same way, and it should not be discriminating, etc. And as mentioned, you don't get paid for this service. You only do as much as you are required to, to be compliant. You don't do more since you're benefiting from it!*

The Head of Industry and Wallets (HIW) at a large data aggregator explained that many new generation Fintechs built their businesses on the expectation that PSD2-APIs will release their innovation potential, only to realize that these APIs do not live up to the expectations. He argued however that it is not the banks' responsibility to invest in technology and develop APIs, especially given what many bankers say here about the lack of gain. He argued that:

> *…the ability to service the user should not be dependent on the bank making substantial investments in dedicated interfaces. In fact, they have a perfectly well tested and resilient interface already available through their mobile banking APIs and web interfaces. These APIs are technically no different to what a dedicated interface would have to look like. I mean, the only difference is, is that the dedicated interface has documentation and a support portal for if the API doesn't respond as you expect, you can actually raise a ticket and you get support for it, whereas the customer interface may not have that, but technically, functionally, they operate exactly the same way, but the customer interface often has much higher standards.*

The Head of Legal Banking and Lending (HLB) who works at the same data aggregator as the HIW further added:

> *… considering the fact that we are now more than five years down the road, since the inception of the RTS and PSD2. Everybody had really high hopes around the API just solving all the issues we had within the open banking industry. But it's quite clear now that isn't the case, and we're still dependent on being able to access data through alternative means. So, I think that's an important aspect, that it is very complicated to fully regulate quality of APIs in order to go down that route to create this big ecosystem that we want to see here.*

6.2.2 Security threats

The right to access in PSD2 is a major concern for banks since they are obliged to externalize customer banking data to TPPs. Access to data by TPPs is viewed by banks as a radical shift disrupting the industry and creating various risks for customers in terms of fraud, violating customer privacy, data integrity, and protection. An OBCM working for a large bank reflected on this shift:

> *…we never considered that we could expose the data using APIs with someone external and especially with someone whom we do not have ages of already known collaboration and agreement.*

For instance, the CPM at a large bank explained that PSD2 has made it difficult for banks to check who accesses the data, since data access workflows lack the information necessary to help the bank identify who is trying to get access. He said:

> *…there are different ways to log on to the bank. I mean, when the client logs on in our own channels, we know what phone it is. Where is that? You know the location. We get a lot of information that we don't get through the TPP flow. When the client logs on through TPPs, we hardly know anything…And those are sort of tools that we no longer have with PSD2…I would say that's a major setback when it comes to clients, safety with PSD2 regulation…*

He further added that:

> *…if the TTP isn't fraudulent to our clients, we have no right in the legislation to stop it.*

The LPC also offered insights into using other methods to access data by TPPs that are often perceived by banks as a security threat. She said:

> *TPPs can be quite quick to come to the conclusion that the APIs are not good enough, etc., so it has been common that reverse engineering and screen craping is used, which the FSA doesn't like. The account service payment service provider doesn't always know who is getting access when the TPP is*

using reverse engineering, it looks like the customer is accessing but in practice, it's actually a TPP on behalf of the customer. When a TPP use reverse engineering, they usually don't identify themselves, as they have to do when they use the API…

However, the IE argued that reverse engineering or screen scraping as problematic because TPPs do not identify themselves. This makes it difficult for banks to know who is accessing the data and consider it a risk resulting in blocking whoever is trying to get access. These are however ways for TPPs and banks to ensure identify also in these circumstances.

The HIW from a large data aggregator explained that banks are able to block TPPs from using alternative means for data access if they offer dedicated interfaces that meet baseline compliance. In this case, they are able to get an exemption from the authorities for a fallback solution (i.e. using the customer interface using screen scraping) in case compliance APIs do not work to block any attempts by unidentified actors to access data. He points to the regulatory situation where bank associations have lobbied the authorities to agree on baseline compliance which allows banks to satisfy the regulator. At the same time, banks should be able to handle what they perceive as a security threat due to the use of methods such as screen scraping. He commented:

…for a bank in order to obtain that fallback exemption, in other words, to be able to block third parties from using screen scraping technologies for the access of the customer interface they need to receive a recognition or exemption from their competent authority. Now, the competent authorities across Europe are not competent in making technology assessments… what has happened is that trade associations and the bank associations have lobbied with the with the competent authorities, and have agreed, if we deliver X capabilities, the agreed baseline PSD2, we agree that we provide a dedicated interface that third parties can use, and an exemption can be granted … What has been agreed with the competent authorities is actually what is a baseline compliance and so that means investing in APIs is being funded out of a compliance budget. And the compliance budget will never get more budgets than what is needed to satisfy the regulator. So, it's not a question of what the bare minimum is. It is a question of what satisfies the regulator.

This seems to be aligned with the IE's assertion that the rate of open banking payments that are not executed due to fraud suspicions may be higher compared to card and Swish payments, which often get executed without problems. He argued:

… when you initiate the payment, sometimes that payment is not executed by the bank, and the bank will say, well, actually, I have some kind of fraud monitor that sometimes says, Well, this is a suspected fraud or the like, and the payment is not executed. Then the recipient does not receive the payment. I think that is fine. I think if there is suspected fraud of course the payment should not be executed. However, when it gets to a high share of initiated payments, then you have a problem. In particular, a problem, of course, if you make a card

payment, all card payments are more or less executed. If you make a Swish payment more or less all Swish payments get executed, so it becomes an unleveled playing field if you initiate the payment through open banking, and you have a relatively higher share of those initiated payments are not executed.

Many bankers interviewed for this research recognize that data access by TPPs has made fraud prevention harder for banks, but banks still take measures to monitor data access. The CPM at a large bank said:

…all the banks, do certain things to monitor their traffic, and I can't sort of go into any details of that, but we made sure that we took some precautions and monitor the traffic very closely. Banks adopt a more cautious approach to open banking payments, which may explain why many payment initiations are not executed. This heightened vigilance stems from the challenges that they face in detecting and preventing security threats, which seem to be particularly stressed in association with open banking.

6.2.3 PSD2 compliance and enforcement

There is a common perception by both banks and Fintechs that PSD2 is a project for compliance. Many banks perceive PSD2 as something that they must comply with, and the priority is to satisfy the regulators as argued by the HIW in an earlier comment. This might have implications, as will be shown later in section 6.3, for competition and innovation in the market. Banks still prevail in the market despite the growth of Fintechs and the emergence of PSD2 and open banking. In answering a question about power asymmetries between banks and Fintechs, the IE believes that PSD2 is not being properly enforced. He commented:

I think PSD2 as a legislation was very good. I think the problem came with the EBAs interpretation of certain articles and the fact that some supervisor authorities across Europe are not enforcing the API. We're not enforcing good APIs with the banks, because the big problem was that some of the APIs that were designed and offered to TPPs, and still today, they work very, very poorly. It's multiple steps. It is a plethora of issues, different ones. And I think we're lucky in Sweden is one of the better markets with APIs

However, the HIW argued that the ultimate goal of the regulations should not be increased enforcement per se. He explained that the relationship between banks and TPPs should be principle or outcome-based where dedicated interfaces meet certain criteria that encourage banks to offer good APIs and help them overcome data access concerns. He said:

…there are those who believe that the requirements on banks should be even more stringent. We believe the opposite. We actually believe that the regulation should actually be more principle based and outcome based. Be clear that

the access of an interface needs to meet certain criteria. For example, the interface, well, preferably it is a technical interface, or machine to machine interface, but it is secure. It is encrypted, and it allows for the submission for ID certificates, right, which is a requirement on the third party provider side, because we're required to identify ourselves with identity and qualified certificates, right? And already, if you establish this, this means that whoever is providing the interface, whether it's a dedicated interface or a customer interface, it can always make a distinction between if it's the user, if it's an authorized third party, or if it's an unidentified actor. Already with that simple principle, you can make that distinction, we don't believe in sort of mandating banks in creating APIs or more stringent SLAs. We actually believe in an outcome based if all, let's say customer interfaces are accessible to regulated third parties with the consent of the user, then there is a business incentive for a financial institution to make sure that when they provide a dedicated interface that it provides better performance, better support and potentially even better functionality for the third party than what they can access via the customer interface, and that creates a natural dynamic market dynamic and an incentive for those third parties to use a dedicated interface rather than a customer interface.

6.3 Perspectives on competition

All bankers interviewed for this report share a common view that PSD2 is a threat. The FE at a large bank projected that if he was meeting with a group of peers from other banks and said that PSD2 is a threat most of them will just nod their heads in agreement. The CPM at another large bank offered an unfavorable view of PSD2 in terms of potential gain by banks and their standing in a competitive market. He argued:

…we need to build interfaces, buy the infrastructure, have 24/7 monitoring and uptime for our APIs, similar to our sort of regular channels, and hand out data to anyone who asks with our clients permission. There is very little gain for the banks to do all this. I mean, these are huge investments in infrastructure and software, and we don't get anything for it… I think it's not regulations meant for the banks to be happy about.

The LPC from a large bank also stressed that:

it is a lot of technical development that is required that you don't really get paid for…It feels like the regulations sometimes punish them (banks) for being big actors and having a lot of customers.

A Senior Digitalization Advisor (SDA) from an association representing the interests of banks in Sweden acknowledges that banks are changing their approach towards PSD2 and other upcoming regulations by becoming more open to opportunities and

acting as data users. While at the same time, she recognizes that banks are still investing heavily in infrastructure and arguing that the cost will be more for them as new regulations come into force. She explained:

> *I mean, still it is more costly. I mean, it costs more than it gives, ... And also, the compensation is still an issue…. So, it's still a cost, and it will be even more within PSR and PSD3 that are coming. So, I'm not sure that it will be like something they are winning from ever.*

In addition to these concerns, banks perceive a competitive threat by Fintechs due to the asymmetry between them in terms of digital maturity and agility. For banks, this affects their capacity to leverage potential opportunities with open banking. More precisely, it might hinder banks to compete in certain market areas resulting in potential losses in market shares. The CPM at a large bank reflected on their technological limitations which impact them to move into market competition. He said:

> *We as a bank are rarely the first one with sort of a new high-tech function or a new sort of service. We are more like wait and see the things we don't do.*

The Chief Commercial Officer (CCO) from a small Fintech startup commented on the initial reaction by Fintechs toward PSD2 by describing the lack of bank experience in developing open APIs for external data access compared to the common use of APIs for internal communication. She said:

> *I think everyone in the Fintech ecosystem had a different set of expectations on the banks before the deadline, and they would expect that the banks had been coming further than they actually did, which is why there is a lot of frustration in the ecosystem as well. From the Fintech side, there's a lot of frustration towards banks for not delivering as high quality APIs as tech companies would expect which, on the other hand, is understandable. If I take my previous bank experience when we started this, is there anyone who's been doing open API development before? Do you know how many developers we found with this experience? Zero. Open APIs were not a thing in the banking industry. There was no experience in it before open banking…*

The FE further explained the threat banks perceive from agile FinTech entrants in the payments market. He, like several other bankers in this study, pointed to two key factors driving this threat: banks' lack of agility and the internal cultural and political barriers that prevent them from recognizing and capitalizing on the opportunities PSD2 offers. He said:

> *…if you're really big and you know, banking comes with a lot of regulations…we are not the fastest mover, right? Because it takes a lot of time to implement stuff in a large organization with a lot of systems and infrastructure, etc. So, I would say the threat comes from one, we are not able to move fast enough so there will be others who could sort of exploit the opportunities before we get there. Second, the other thing being that in a large organization*

as well, in terms of like politics and culture change is a bit more, you know, cumbersome to do than if you're working in a small organization. So there's always a risk that you just end up doing like the regulatory stuff, meaning that we do enough to be compliant in this new environment, so we build the APIs so customers can get their data, but we're really not having the change capacity to really invest and to also use the opportunities, because that always tends to come sort of after being compliant, compliant first, and then look for business opportunities second.

The LPC also shared a similar view:

…there are a lot of legacy systems, so sometimes development takes time. The Fintechs usually are built on only newer technology, and can therefore be quicker in their development and adjustment. It is important that the regulators understand this.

While these concerns by banks may be legitimate, it was observed during the investigation that Fintechs are skeptical about claims such as the lack of technological capacity by banks to develop 'proper' APIs. This might offer one explanation among many about technological barriers facing Fintechs with regard to the poorly designed APIs that make it hard for them to access data. The FE further highlighted an important issue regarding decision-making routines and accountability in large organizations like banks. As mentioned earlier, PSD2 introduces new areas of focus from the bank's perspective, which may require decisions to pass through multiple levels of hierarchy before being finalized. However, Fintechs' skepticism toward these concerns may also reflect a competitive dynamic in which banks attempt to create conditions that slow down or hinder market competition. These concerns can be seen in an analogy made by the IE about how PSD2 can contribute into diminishing the bargaining power of Fintechs. He explained:

I think the analogy that's been made is like, if you have an elevator and a staircase, and you want to get into the bank on the second floor. Before PSD2, everyone used the stairs, consumers, direct customers of the bank, as well as TPPs. PSD2 then came and said, Hey, bank, you can build an elevator that only PSPs should use as a dedicated interface, and that's fine. But what if the elevator isn't working? … Well, then the supervisor authority can actually ask them if you can close the stairs for only PISPs, your customers can still take the stairs, but your TPPs are not allowed to go there. Well, then it's a problem if the elevator doesn't work...

He further added:

…if the elevator is built only for Fintechs, and Fintechs is a competitor, they are competitors, or the incentives they have for the elevator to work well, because of the elevator, in many cases, does not work well. And if the Fintech is not allowed then to go through the staircase, then the Fintech, you know, is at a disadvantage in terms of offering a good service to the user.

Thus, his main point is that using poorly designed dedicated interfaces solely for baseline compliance does little to help Fintechs in providing quality services. This leaves them at a competitive disadvantage, especially since banks have no incentive to create "better" interfaces, as there is no direct benefit for them. The issue of good APIs is a common concern among Fintechs and can be referred to two main factors: one, that banks approach PSD2 only as a compliance project and not as a project to develop innovative technologies, second, that there is a technological gap between banks and Fintechs which might suggest a lack of technological skills on the part of banks to develop good APIs. In either case, it can be argued that there is no 'levelling of the playing field" in this situation and access to data can still be compromised. This aligns with perspectives shared by bankers who stressed that Fintechs are trying to compete with banks, while banks see no gain in offering them access to customer banking data. The HOF at a large bank stressed:

> *I think a lot of the fintechs also were positioning themselves as alternatives to the big banks, so they really went for competition…there is very little gain for us.*

An interesting insight shared by the CCO at a small Fintech captures the competitive tendencies by Fintechs in the initial stages of PSD2:

> *I think a few years back, there was a lot of FOMO (Fear of Missing Out) going on in the industry… all the Fintechs said that they would eat banks for breakfast. I've heard that quote myself from Fintechs back then, we're going to eat them for breakfast. That has still not happened, right? But the fintechs then, instead, started collaborating with banks and became suppliers…*

The CPM at a large bank gave an example:

> *They are certainly competitors to the client that we used to own in full. And if you look at the behavior…you know Kivra. So, … what used to happen was that you paid your bill in the bank and sort of interface, mobile interface, or whatever, and now you pay it in Kivra interface…It's easy to pay… when everybody's using that, maybe they will add a small fee, like 10 öre, per bill… They can also learn about our clients behavior and sort of when they know that they can also come with competitive suggestions for the client and what they should do. And these are things that sort of didn't happen before, not on that level… they are managing so many people's invoices and stuff now they could easily be a new sort of big platform where they, as you say, can offer a lot of things, and where, you know, go to rather than our own interfaces, and then we lose our client meeting digitally!*

This example from the CPM demonstrates how TPPs' access to data opens up new opportunities for competition in the payments market. By offering more payment options, alternative methods, and behavior-driven services, TPPs can attract more users to their applications. Data-based development of payment service innovations can be seen as a novel area of competition in the banking industry exemplifying the platform ideal of network externalities. Further, the LPC shares the same view as

the CPM suggesting that while banks have no gain from allowing TTPs to access customer accounts, it can still be helpful for the customers as they get more services and at the same time allowing TPPs to develop their own businesses. The CEM from a large data aggregator explained the role of his company in enabling such new competitive dynamics by connecting TPPs with customers by stating:

> *…this definitely is something that increases the competition. If you previously could only initiate a payment from your bank, and now you can basically do it from any App anywhere, it definitely shifts the power, right. One of our customers in Sweden is Kivra as an example. So today, a lot of Swedes pay their bills through the Kivra App, and this wouldn't be possible without this technology, and I guess that could be seen as a shift in power that previously you would need to engage with your bank. Now you can engage with your bank, but through the Kivra App, and this is all enabled by open banking.*

Another way to look at this from the perspective of banks on competition is the potential loss of customers as they are unable to move fast enough, the FE explained:

> *…I think in terms of PSD2 we were a bit slow in different aspects for sort of protecting some of our payment areas…*

In addition to losing customers, the LPC argued that building infrastructure to comply with PSD2 costs time and money which shifts the focus away from bank competence areas where the bank can actually make money and be competitive. She argued:

> *…since it is a requirement…you have to do it… and that means you have to put aside other things sometimes... You only do as much as you need to do to be compliant. You don't do more because you're not gaining anything from it.*

This can be related to what the IE said above about the sometimes poorly-designed APIs by banks not reaching baseline compliance. From a bank perspective, not only complying with PSD2 is expensive and produces no profit for them, but it also redirects their resources from profitable services into areas that benefit their competitors. The LPC further elaborated that PSD2 stands apart from other regulations because it has a direct and transformative impact on banks. Unlike regulations such as AML, which primarily affect internal processes and have a more indirect influence, PSD2 requires substantial investments in infrastructure, as well as ongoing efforts to ensure quality, optimization, and system uptime. This makes compliance with PSD2 more demanding and disruptive to banks' existing business models. She added:

> *If the ASPSPs could get paid for the APIs, it would be a more incentive to make it even better which is benefiting both the data holder and the user.*

The emergence of data aggregators like Tink, for instance, can help address some of the concerns banks have around developing technological infrastructure, allowing

them to focus more on their core competencies. The CEM from a large aggregator explained:

> *…if you want to do it from scratch yourself it takes a lot of time, probably you don't have the resources. So, I mean, that's why you would use a TPP such as Tink, because we have been working with this for the last 12, 13 years, we have optimized for conversion. We have a lot of ready built functionality that you can add on top. So, it will, I think, in most cases, be much more expensive, much more time consuming, and probably you will not have the same quality since, I mean, Tink is a leading platform in this area, we put a lot of time and effort into developing the product so it is as good as it possibly can be. So, it's basically, if you want to do it yourself, you would need to build your own thing, right? Employ hundreds of people across multiple countries, and your time to market would be so much longer. So, it's a service that we are providing. Instead of building it yourself, you buy it from us.*

While the CPM stressed several times that there is "*very, very little gain*" in PSD2 for banks, he did recognize that open banking has become part of everyday business and that the bank that he works at is exploring it. He said:

> *…we could probably choose to explore a bit more on open banking with the possibilities there is, because we can equally get data from other banks, right?*

As access to data and open banking become increasingly normalized, banks are noticing a rise in the number of Fintech companies and their diverse offerings. This trend may indicate a market shift, where traditional barriers such as poor APIs and banks' hesitance to act due to competitive concerns are replaced by a commitment to enhancing infrastructure and improving bank practices. By fostering collaboration with third-party providers (TPPs), banks can focus on service development and expand the range of market offerings. The CEM commented on the maturity of the open banking market suggesting that banks are developing better APIs:

> *I think that when the PSD2 regulations came, we saw that there was different quality in these APIs, and that some banks, perhaps didn't build the best APIs because it wasn't in their interest. As the market has matured, I think that basically, at least, if you look in the Nordics now, all the PSD2 APIs, they have good quality…*

The same sentiment was shared by the RM from a small Fintech who has a previous bank experience. She explained that it has been hard for banks to develop good quality APIs because it is only a cost for them. Her reflection was made in the context of discussing the scope of PSD2 where banks can be compensated within the regulation in order to be more motivated to partner up with companies like hers. She reflected further:

> *I also think there has been a lot of problems with APIs, not for us now, I would say, from my previous experience, is that the banks have had really hard time to build good APIs, and I think the banks should be compensated in some*

way…you have regulatory requirements to open up the banks for us, and the bank has actually tried really hard to create good APIs, but it is really the conflict of interest, you know, the banks only have to pay…

Reflecting on upcoming regulations, the FE described mixed feelings at his bank with regard to PSD2 and also the upcoming FiDA regulation. He explained that the bank finds itself now in a similar position like the time when PSD2 came into force. He said:

I think we find ourselves today at a similar position as we were before PSD2 came into force. Basically, we see, of course, this with a mix of feelings being, you know, a large bank with a lot of customers and a lot of infrastructure, obviously, you could see this as a threat, just that you open up possibilities for new entrants and competition…I found also, of course, this is giving us tremendous opportunities to do and create better services for our customers going forward… So, we will not only be able to have the data that we have on the customer internally, but we could also ask the customer to share data from whatever they have like in our bank and other banks, or, you know, wherever. And based on that, we can give them really a holistic advice on their economy.

An interesting observation is that banks recognize the value of accessing customer data from multiple channels. This broader access enables them to offer more comprehensive services, a capability that is often limited when relying solely on internal customer data. The LPC shared insights into this and how banks can act as TTPs, she said:

…we have two hats on. We are, on the one hand, the Big Bank with all the data and all the accounts which we need to open up through API. On the other hand, we, also want to make it possible for our customers to access payment data from other account holders. Then we are acting like an AISP. Then it's more like a business case for us offering it because we want to and not because we are required to by regulation…

When asked about the dynamics between banks and FinTechs, the LPC emphasized that it should be easy for new players to enter the market and compete. However, she expressed some reservations, noting that such competition comes at a cost for banks, as she explained:

…it is a free market and we are where we are because of the development and what the banks have provided during the years. But of course, it has to be easy for new players to also enter the market, because that's also good for the customers. I mean, the regulation makes it more equal. Of course it does, but it costs. It is a cost for the banks in some way because they provide equality in the competition to get customers and to create services that the customers can use… it makes the banks being on their toes more…they need to have a greater interest in developing services because there is more competition. So of course, it's good in that sense, from a broader perspective for the society and the customers.

6.4 Platform Partnerships

The perception of new entrants into the open banking market by banks has notably shifted since the introduction of PSD2 in 2019. In the initial stages, banks' approach to PSD2 was primarily focused on compliance, which helps explain both their perception of new non-bank TPPs as a competitive threat and the development of inadequate APIs. A CPM from a large bank explained the experience in his bank as follows:

> *…we were mostly sort of concerned about being compliant and doing well, being a server, really for others to get data from. It's only until recently that we started to be act more determined in the open banking market than we used to do so…*

The SDA from the bank association echoed the same sentiment. She described that, in the early stages of PSD2's implementation, banks viewed the directive primarily through a compliance lens, recognizing the high cost of building the necessary infrastructure, as mentioned earlier section 6.3. However, she noted that this view has since evolved, with banks now seeing opportunities not only in PSD2 but also in upcoming regulations like PSR/PSD3 and FiDA:

> *What do you think about open finance in general, as what your bank is thinking. And I would say all of the them where we talk see it in a positive way, because now they have become more mature and not only see just competitiveness. They can do something and we're heading to that direction, either we want it or not… It seems like an opportunity for you and for your customer that you can collect data from others, like you can also be a data user in this sense… many banks see this as an opportunity, and see like they need to be more customer centric, and they need to not just comply.*

The FE reflected on the shift in banks' perspectives, particularly in light of upcoming regulations, and acknowledged that in this evolving banking landscape, collaboration and partnership with others are essential by stressing:

> *…the need for partnership will increase over time with FiDA. We cannot do everything. We cannot be best in everything on our own.*

This shift in perspective is also acknowledged by data aggregators as the CEM highlighted how banks are exploring new sources of value with open banking, he said:

> *…when open banking was launched, a lot of players were interested in technology. It was more about finding the right business case and creating a good value proposition and basically justifying investing into building something on the technology that has been taking a little bit of time. I think that it has become clearer how this brings value to these companies over time.*

The main characteristic of this evolution in mindset by banks is the transformation from data holders into data users. As data users, they can use APIs to access data from other sources and apply it in their own business. The SDA from the bank association argued that banks nowadays use APIs more than Fintechs. The FE pointed to an evolution in the open banking market and the view of competition by both banks and Fintechs. He acknowledged that banks cannot do everything on their own and they are not supposed to build all APIs especially as banks prepare for the upcoming FiDA regulation. He further explained that many Fintechs initially wanted to compete directly with banks, and even position themselves as alternatives in the market. However, Fintechs as small organizations recognized over time that it might be more beneficial for them to partner up with banks who have a large market share than going directly after the customers through service development and platform integration. The FE described this:

> *I think that time had tell that you see a lot of those Fintechs have actually changed the costume a little bit, so they're not anymore doing like competition. They're more like being service partners to the big banks. If I think of one really great example of that is, Tink, of course. As you know, Tink started off trying to go directly towards the end customer, but quite soon realized that it was better option for them to work as a service partner to the to the bank. I think that is what happened with a lot of a lot of the Fintechs, that they have come to realize that it takes a lot of time and money to go for reaching a market share. So, it's better to partner up with somebody that already has a lot of customers…We work with a lot of those Fintech companies, or have partnered up for specific services which they have developed and that we have now integrated into our platform.*

He mentioned a few examples of such services that are integrated in the bank core platform such as personalized financial managers or budgeting tools, payment categorization engines to categorize payment transactions and get better overviews of spending, and subscription management services that analyze subscriptions (such as Netflix and Telia) helping customers evaluate their necessity or suggest better alternatives. This is reflected through new forms of partnership where TPPs develop services that are integrated directly into bank platforms. It highlights a shift, as banks are now adopting externally developed services within their own channels—something they are not accustomed to as stated earlier by the FE. Many bankers expressed this evolving view, indicating a growing openness to partnering with TPPs as part of the market's ongoing maturation. The CPM for instance stated:

> *…we have a good relationship with most Fintechs, at least the big ones that we communicate with. So, we have even expanded our own business in the open banking field and PSD2.*

As stated earlier, the IE suggested that PSD2 sets a baseline for a conversation between banks and Fintechs outside the scope of PSD2. In this regard, he believes that there are ample opportunities for collaboration and partnerships to extend APIs and add more functionalities that are needed by Fintechs to offer better services. For

example, he proposed that premium APIs developed by banks could be one way to establish partnerships where the gain would be mutual. He also offered different areas for collaboration such as bank-AISP collaboration to offer bank customers account aggregation services or bank-PISP collaboration to offer payment services to merchants.

The HOC at a small Fintech explained that her company engages with other banks and Fintechs to develop their services. She stressed on the fact that many of the services in the market are built on top of each other and that companies need to collaborate, she said:

> *… we are collaborating with others, both banks and other Fintech companies for our services, and in my experience, that's how pretty much all Fintech companies operate. You have a lot of partnerships, and you have your service, but it's built on many others. Like, for instance, BankID is something I think pretty much everyone relies quite heavily on. So, you have to maybe find ways to utilize and maybe you don't do it yourself, but you collaborate with someone who can, and then you can integrate it into your service.*

In a similar vein, the RM at a small Fintech explained that, as a small company, they are keen to partner with other banks and Fintechs to expand their service offerings. She emphasized the necessity of such partnerships due to the regulatory barriers posed by PSD2. She pointed out that PSD2 can be costly for the company, and given its focus on payments, the expense of obtaining a PSD2 license makes it less appealing for the scope of their business. She said:

> *… we want to offer services that you have to be a bank or a credit institution to offer them. But, I mean, we are part of banking, you know. It is super expensive, and so we can't offer those services. So, we're working with partners offering services for customers instead.*

A key development in the market driving reliable data connections and fostering greater engagement between banks, TPPs, and customers is the rise of data aggregators, playing a crucial role as intermediaries for data access and exchange. As discussed in the next section, companies like Tink play a central role in the market's evolution and the shift toward greater partnerships among major players. The HLB at a large data aggregator reflected on this evolution and how banks are developing better APIs for improved connectivity with TPPs and other partners. He said:

> *I think that when the PSD2 regulations came, we saw that there was different quality in these APIs, and that some banks, perhaps didn't build the best APIs because it wasn't in their interest. As the market has matured, I think that basically, at least, if you look at the Nordics now, all the PSD2 APIs, they have good quality, and it is more or less like normal practice in the market to have good enough APIs to connect to.*

He further elaborated on this market evolution by pointing out to the emergence of a new financial ecosystem, where growing connections between banks and TPPs are becoming a necessity for market innovation. He explained:

> *I mean, the ecosystem has really exploded for the last couple of years, and I think the banks really start to acknowledge the fact that they will be more and more dependent on Fintechs and third-party providers in order to become innovative themselves, right? So, we're slowly seeing this, you know, improvements because of the ecosystem that is forming.*

A CCO at a small Fintech also reflected on the evolution of an open banking ecosystem likening it to the mobile ecosystem of the iPhone:

> *I see open banking and iPhone, fairly similar, out of some perspectives, and I think one of the main ones is that we look at an ecosystem that is currently very, very immature. We're looking at the likes of, not the iPhone where we are now, but maybe iPhone 1 or 2. That's the version of open banking that we have currently.*

The CCO elaborated that she sees a new financial ecosystem emerging out of open banking as banks and TPPs engage and partner with each other both in consumer and business segments. She however stressed that this emerging ecosystem is still very immature and in its very early stages. She believes that the evolution of the open banking ecosystem follows previous developments in banking such as branch banking, online banking, and mobile banking. The beginning of each phase was then marked by initial suspicion and slow customer adoption. The CCO argued that open banking that is pushed by regulation anchors a major shift in the financial ecosystem. The Head of Open Banking (HOB) at a large bank envisions that such an ecosystem would be the "*App Store of financial Services*" where products and services are developed by external parties. He said:

> *We could become the Appstore of financial services. And of course, that is in our long-term plan, but for that we need to find API providers that are external that can provide products that our customers want to buy, and we can be the orchestrators!*

The CCO at a small Fintech, on the other hand, argued that open banking is lacking such orchestrators. She makes another analogy to the tourism industry where platforms such as TripAdvisor and hotels.com bring together all players in the industry in one platform to offer services and products to the customers. She believes that this is still lacking in the open banking ecosystem as she said:

> *I think what the ecosystem is still very much lacking is the orchestrators… for me, as a consumer, there is no overview of what kind of financial services are offered to me*

6.4.1 The role of data intermediaries and platforms

Data intermediaries such as Tink play a significant role in the open banking market by enabling data and service exchange between banks, TPPs, and customers. Tink plays an important role as a unique type of TPP that is specialized in aggregating and processing data to make it accessible to banks and other TPPs through their platform infrastructure. Head of Industry and Wallets (HIW) explained the role of his company as a data mediator:

> *…we offer through a single console or platform environment where our customers can integrate essentially with a single line of code into their own applications, and with that integration, their users can essentially consent to allow either, depending on the setup, our customers to access their information or allow Tink to access the information, transfer the information to their service provider. So, there are different setups, but essentially what we do is we offer a platform as a service, if you will, where all of those integrations are managed. And our customers can essentially, with one line of code, one API, get access to all of the integrations that we have consolidated within that platform.*

As banks tend to be burdened with heavy investments in technology and also their lack of technological skills, companies like Tink can help them to access data and facilitate data exchanges through its own infrastructure without the need to make huge investments in technology. Head of Legal Banking and Lending (HLB) explained the role of his company in providing a platform infrastructure that can be used by banks and other TPPs to facilitate their data exchanges and partnerships:

> *Through Tink technology, banks can connect to other banks, or basically any Fintech company that would like to create a new, innovative service. They can also connect to the banks. They don't have to build all these connections. They use Tink, and we have everything sort of built for them.*

Head of Industry and Wallets (HIW) offered more elaboration on two core categories that the company provides as follows:

> *We've essentially created a portfolio of tools that innovate around the rudimental access of information and creating alternative payment methods in the market. So, these are two different business models. The access to information essentially allows us to improve business processes as well as customer experiences by automating steps that would otherwise require a user or a business, minutes, hours, days, or even weeks to complete. This can be, for example, the consolidation of payment account records. It can be the analysis of payment transaction history, or it can be the transfer of information for the validation of an identity. On the payment side, what we do is we enable our customers to take forward a solution that provides an alternative payment method to whatever is incumbent in the market. So, that can be a card solution, but could also be a local account to account solution. And in all of our solutions, we restrict ourselves to only the information exchange. We do not touch any of the funds. We do not provide a financial service as such. We provide a regulated service*

because we are licensed to have access to accounts under PSD2 but at its core, we are providing information services, and we're simply facilitating the exchange of messaging between a service provider, a bank, a data holder, and its users.

Many bankers interviewed for this report referred to Tink as an important player and partner in enabling data exchanges. For example, the CPM at a large bank said:

…there is a client Tink, and we buy external data from them. We use Tink as our sort of integration hub to the other field of banks and institutions to sort of build those kinds of services around that data. And they are our go to guy when getting data.

Tink as data aggregator and intermediary also focuses on adding value to data and offers this as service to banks and TPPs. This 'clean' data as described by the HLB, is value-adding for banks and TPPs which they can benefit from without getting burdened by technology investments and licenses, he said:

…we gather transactional data through open banking, through PS2 connections, and then we add value on top of these transactions. Basically, what we do is that we clean the data, we categorize the data, we understand what the transactions are, then we can build insights on top of this, so you can understand what you have spent in different categories, or understand how much money you will have in the end of the month, or similar. So, typically, it is about productifying like what open banking data can generate in terms of value.

In this respect, the FE offered an insight into how banks view the role of data intermediaries in the market, he explained:

I mean going to FiDA we will need a lot more connectivity so I would think that intermediaries that are able to, in an efficient way, aggregate data from different banks and put them together are crucial. But there are other players in other domains, of course. I think those will become important, because I don't think that we can or should build all the APIs ourselves, maybe some, but not all, because there's probably all this long tail, if you want to have 100% or near 100% connectivity.

While Tink helps banks, TPPs, and also end customers to access and exchange data, the HLB stressed that no formal partnerships are needed to access data between banks and TPPs. As a data mediator, the relationship between banks and Fintechs is primarily a data connection enabled through APIs and Tink aims to facilitate this connection. He offered a clarification:

This is basically an open technology, right? So, there is no need for a formal partnership. So, say that you are a Fintech company and would like to access the data that is stored in, say, an incumbent bank. We provide that service to our customer, the Fintech company or the bank or the financial service pro-

vider, through our technology, we can enable them to build new user experiences, etc. But we don't provide any direct relationship between the Fintech and the bank, right? The bank has its APIs. It's open APIs, and since we are licensed, we can access those APIs and let end users share their financial information with the Fintech.

A very interesting dimension of the work done by data intermediaries is enabling TPPs to access data using Tink licenses. This means that through Tink platform, TPPs can access data without being required to have licenses themselves. In this way, data intermediaries not only facilitate market entry for TPPs but also enable more effective use of data, overcoming licensing barriers like scope and the cost of building technology infrastructure. The FE further explained:

So, you can use Tink's license to aggregate the data, to collect the data, okay? And I think that … what we see in the market is that more and more companies are interested in this data because I mean it is value adding. You can build products, experiences, get insights that you wouldn't be able to get elsewhere.

…instead of building everything themselves, they can just license our technology and use, if they want to, our licenses as well.

In this respect, the HIW also added that while Tink is primarily a technical service provider, there are also other models where they act as a service providers especially for Fintechs without licenses. He said:

… because we are regulated institution ourselves, there are also commercial models where our customers may not be a regulated institution and may see opportunity to benefit from that. In those situations, we are not only a technology provider, but we are also a service provider to the user himself and that means that our role in the market is contingent on the use case and the business of our customers.

In addition, data intermediaries are creating opportunities for economies of scale as banks and TPPs connect to their platform. The HLB explained that his company has connections with 6000 banks in the EU, and that their platform can enable both banks and TPPs to act on their ambitions to offer services for the global market, he argued:

…many of the fintechs, they have global ambitions, so they don't want to just be able to connect to Swedish banks. So, I mean, a huge benefit for Tink is that we're connecting to basically a large share of the European banks, and we are also in the US now. And long term, I think that the ambition is to scale this globally. So, it is an economy of scale that if you have a big platform that is working well, it will be requested by the customers, and it will be too hard to build it yourself.

He further pointed out that the market is not homogenous. He refers to Southern Europe where the API quality is still low and the user journey is longer which creates friction in market, and affect the growth of a larger cross-border financial ecosystem, he said:

> *… if you look in, say, Southern Europe, we still see some examples where the user journey is longer than necessary and takes additional steps in order to share the data, compared to if you would just log into your mobile banking app. And basically, the ambition is that it shouldn't be cumbersome to share your data to a platform..*

7 The Changing Competitive Landscape and the Emerging Open Banking Ecosystem

7.1 PSD2 and the Competitive Landscape

The competitive landscape of open banking is still in a state of evolution. PSD2 represents a new territory for both incumbent banks and TPPs. In Sweden, the market of open banking is maturing. The initial stages after the introduction of PSD2 were marked by tension. Banks scrambled to develop digital infrastructure and ensure compliance with the new directive, while TPPs positioned themselves as competitors to seize the opportunities in the market.

The investigation in this report shows that banks initially perceived PSD2 primarily as a competitive threat, especially since providing data access to external unknown non-bank entities was entirely an unorthodox practice in the banking industry.[228] There are several reasons for such perception. Banks have not traditionally engaged with external actors without longstanding collaboration and agreements. PSD2 mandated them to engage with licensed external third-parties through giving them access to customer banking data without the need for formal contracts or agreements.[229] This limits banks' ability to maintain control over data[230] and operational banking practices as they can no longer deny access or effectively monitor the usage of data by third parties. Bankers indicated that this was a radical shift in the industry, where competition in the market is one of the primary concerns along with concerns about customer security and protection.[231]

Compliance with PSD2 fundamentally relies on banks investing in digital infrastructure and developing APIs to enable data access. Banks make substantial investments in infrastructure in order to comply with PSD2. All banks in Sweden, and generally in Europe, developed API platforms or marketplaces that are publicly accessible and used by third-parties to access customer banking data. Banks often perceive such investments with uncertainty regarding the potential gain from technology. Several bankers, interviewed for this report, stressed that the high expenditure on technology is viewed as a compliance necessity, rather than a source of clear immediate value.

While being a heavily regulated industry, PSD2 is particularly seen as a disruptive directive by banks as it impacts fundamental banking practices unlike previous regulations. Investing in technologies to enable data access by new entrants perceived as competitors is making banks lose a foothold in the retail market, which has often been seen as safe from competition. Examples can be seen in the rise of

[228] Botta et al. (2018); Brodsky & Oakes (2017).

[229] Radanović (2024): Gounari et al. (2024).

[230] He et al. (2023).

[231] Berber & Atabey (2021); Passi (2018).

companies which allow customers to pay for their invoices directly from their app without the use of credit cards or bank transfers. In contrast to other regulations that address money laundering, banks typically implement technologies to make banking safer for the customers rather than to externalize data to potential competitors and lose customers. PSD2 as such is transforming business practices and enabling new business models.

Furthermore, being large organizations, banks' view is that it is harder for them to adapt and respond to such fundamental market changes. PSD2 is seen as a driver for profound change in market digitalization[232], given that it shifts focus to customer data and the development of data-based digital financial innovations. Banks, however, rely on legacy systems in their service offerings, and their flexibility is constrained by their large organizational structures. Organizational size is regarded as a challenge for banks to navigate the new competition environment after PSD2 especially when faced with agile, tech-minded, third-party providers. Reliance on legacy systems compromises the innovative potential for banks. Banks do not necessarily possess the technological expertise and mindset to leverage PSD2 and engage in generative development of digital innovations together with third-party providers. Their focus on PSD2 as a project for compliance rather than digital innovation is also an important factor for why banks perceive TPPs as a competitive threat. As large organizations, banks do not have the agility or capacity to develop technological skills and infrastructure to compete with TPPs. This is one of the reasons that explains why TPPs tend to be dissatisfied with the quality of APIs developed by banks, which is frequently cited as a major problem for market competition.

Albeit another concern is the allocation of resources and budgets for PSD2 development within banks. The investigation in this report shows that banks follow baseline compliance set by authorities, and they only focus on that as they develop compliance APIs. This means that PSD2 resources are largely allocated by banks to satisfy regulators rather than innovate. Such behavior has implications for competition as TPPs might have a technological edge against banks in the market, while banks lose on the innovation potential with PSD2 as they focus on compliance and existing core competences. However, the competitive environment is still dependent on banks who are responsible for API development and hold the keys to data vaults.[233]

Fintechs and other TPPs recognize this power asymmetry and their dependence on banks. Many Fintech professionals, interviewed for this report, stated that PSD2 is a good development for market competition and potential "levelling" of the playing field.[234] They pointed out that PSD2 removed several barriers for them with regard to accessing customer data and offering payment services. Bankers also indicated

[232] McKinsey & Company

[233] Palmieri & Nazeraj (2021); Brodsky & Oakes (2017).

[234] He et al. (2023); Palmieri & Nazeraj (2021); Passi (2019); Botta et al. (2018).

that PSD2 is a positive development for new players, suggesting that PSD2 makes it easier for them to enter the market that is useful for bank customers and the overall society.

Prior to PSD2, TPPs used unregulated methods such as screen scraping and reverse engineering to access bank accounts on behalf of the customers. These methods are today considered a threat to customer safety and the banks´ own protection. Many banks would also take measures against TPPs using these methods such as blocking their IPs, and also warning customers benefiting from third-party services. PSD2 regulated access to customer data by TPPs, and the use of such methods may not be as necessary as before. However, banks in Sweden rely on APIs as dedicated interfaces to enable data access by TPPs.[235] The quality of APIs has been central in shaping TPP perspectives on the potential of PSD2 for competition. Fintech professionals argue that compliance APIs offered by banks are poorly designed as they are slow and require a longer user journey. All Fintech professionals, even bankers, pointed out the issue of quality regarding APIs. Bankers are aware about the quality of APIs concerns by TPPs, although they maintain the position that the offered APIs meet compliance requirements and that banks continue to optimize their functionality through ongoing engagement with TPPs. The investigation in this report highlights that banks may be constrained by both their limited experience with developing open APIs for externalizing data access and their compliance budgets that are aimed at the baseline of compliance. At the same time, banks may have competitive motivations for their bare-bone compliance and the development of 'good-enough' APIs. As primary channels for data access, API quality is critical for TPPs' ability to develop complementary products and services for the retail market. It can be argued that banks' perception of TPPs as competitive threats might explain the poor quality of APIs. Many Fintech professionals mentioned that APIs do not usually function well, and a higher number of initiated payments via APIs do not get executed compared to other payment types such as card or Swish payments that almost always get executed.

In this way, banks use APIs as control structures[236] to manage data access and thereby the behaviors of TPPs. This constrains the ability of TPPs to develop competitive services, reinforces dependence on banks, as well as maintains power asymmetry between banks and TPPs. TPPs are at a competitive disadvantage in this situation, because they are not able to offer enhanced services that can compete with bank services both in terms of service quality and pricing. In mobile application marketplaces, platform owners such as Apple act as private regulators[237] by enforcing rules that govern the behavior of third-party complementors, while also determining their level of autonomy and responsibility. As banks use APIs as control structures, the mandate to provide objective, non-discriminatory, and proportionate access[238] to

[235] Berber & Atabey (2021).

[236] Gawer (2022); Broekhuizen (2021).

[237] Gawer (2022).

[238] See Article 35(1), Article 36.

data by TPPs and the prospect for fair competition may be questioned. The way banks control data access can be argued to mirror the gatekeeping behavior of mobile platform owners. This investigation also illustrates that banks do have control measures to monitor TPP behavior. Such control, especially when coupled with concerns over API quality, reveals a competitive tension that challenges PSD2's core objective: to level the playing field between banks and TPPs[239], and further hinders the openness and competition that PSD2 aims to promote.

There is an evident gap between banks and TPPs regarding PSD2 as a regulation with each side arguing that it favors the other. Banks believe that PSD2 is costing them significantly due to large investments in technology at no clear gain. The argument implies that PSD2 is not favorable for banks in the free market, including that there is no financial incentive for them to develop better APIs. In contrast, TPPs view the regulation as fundamentally bank-friendly, favoring incumbents rather than fostering fair competition. The enforcement by regulatory authorities is often weak or inconsistent, allowing banks to circumvent the rules of PSD2. While the directive theoretically opens the market to Fintechs, in practice, banks exploit fall-back exemptions granted by authorities and adopt bare-bone compliance strategies that technically meet regulatory requirements but fall short of what TPPs need to operate effectively. PSD2 may still result in significant costs for banks, which are liable to develop technological infrastructure necessary for compliance, while simultaneously relinquishing control over data that was once fully safeguarded under their oversight.[240] For instance, reports show that banks are investing tens of millions to build API infrastructure for data access without the possibility to charge for it under PSD2.[241] There exists both financial and competitive costs for this. However, TPPs can access, store, and utilize this data without bearing any financial cost. This, in turn, is placing incumbent banks at a disadvantage as they lose over-sight over data and face increased competition which challenge their standing in market. Furthermore, banks are heavily-regulated organizations and subject to extra scrutiny regarding the protection of customers from fraud and data violations under PSD2 as well as other regulations such as GDPR. PSD2 contains several provisions[242] that prescribe banks' responsibilities and require them to implement robust mea-sures to ensure data security and customer protection. This also puts banks in a dif-ficult position, as they must maintain customer trust and protect their data despite limited oversight over the data accessed by TPPs.[243] The open nature of APIs and the lack of oversight by banks[244] demonstrate a regulatory imbalance, where banks bear the brunt of accountability without having full authority over how TPPs handle customer data. This might explain banks' cautious behavior toward open banking,

[239] He et al. (2023); Palmieri & Nazeraj (2021); Passi (2019); Botta et al. (2018).

[240] Mansour & Ghazawneh (2023).

[241] Barber, P. 2023. *America embraces Open Banking*. *Financial Times*. Available at: https://www.ft.com/content/e0203daa-1eca-46fd-a122-f6b4e5e29ec2

[242] For more information on this topic, see the section 3.1.1.

[243] Mansour & Ghazawneh (2023); Botta et al. (2018).

[244] Berber & Atabey (2021).

and perhaps the development of poor APIs, to maintain their competitiveness and protect their customer base. The TPPs interviewed for this report acknowledge banks' fundamental responsibility to protect the customers, but are still skeptical about certain practices such as the low quality of APIs, API agnosticism and the lack of multi-data access channels, perceived discriminatory behavior toward open banking transactions.

Despite these concerns, the view of many TPPs is that PSD2 opens up a myriad of opportunities for them to develop and offer competitive services in market. The investigation shows that Fintechs have different perspectives on the regulatory scope of PSD2. As PSD2 focuses only on payment initiation and account information, larger Fintechs want to see broader access to data. They often refer to the upcoming Framework FiDA that expands data access to include savings, investments, pensions, insurances, etc. Other regulations such as PSD3 and PSR are also cited by larger Fintechs, which they hope would remove the current obstacles with PSD2. This indicates that larger Fintechs are keen on competing in the market and growing the ecosystem through broader data access and also partnerships with banks, as will be further discussed later. Smaller Fintechs are largely concerned about costs associated with PSD2 licenses and the need for partnerships with both banks and other larger Fintechs to offer services. They recognize opportunities in PSD2 but are constrained by their limited budgets and range of services they offer.

The competitive landscape of open banking is evolving as there is a noticeable shift in perspective taking place in the market. Both banks and TPPs are increasingly moving away from viewing PSD2 solely through the lens of regulation, and are actively exploring business opportunities for innovative and enhanced services as well as potential partnerships. Banks recognize that open banking is the new norm in business. They are showing growing interest in partnerships to co-develop services, expand their offerings, and integrate TPP innovations into their own banking channels to enhance bank customer experiences. For instance, the development of AI-enabled personal financial budgeting services by TPPs can be integrated with banking platforms. The investigation in this report illustrates that banks are changing their mindset about the view of TPPs as competitors. Banks acknowledge that in the emerging open banking environment, they need to work with TPPs as partners to co-develop services and engage in mutual value co-creation. The quality of APIs is increasing and thereby addresses one of the main concerns for TPPs, which in turn facilitates the competitive development of services in the market. This shift demonstrates the transition into platform thinking and the application of platform business models[245] in the banking industry which is elaborated in sections 7.2 and 7.3. PSD2 is a catalyst for fundamental change in market digitalization. Banks have started to recognize that they can benefit from the technological expertise of TPPs to develop advanced services without the need for large investments in technology. The high cost for developing technological infrastructure and the lack of

[245] Grover & Lyytinen (2022); Cennamo (2021).

technological expertise by banks can be partly mitigated through bank-TPP partnerships.

Data aggregators and intermediaries play a critical role in facilitating emerging business partnerships between banks and TPPs in the market. Their main role is to develop technological infrastructure that serve as platforms for data access and exchange. They are also using technology to aggregate and process data and then develop insights, which in turn improves its value for both parties. This helps banks in avoiding high cost for developing technological infrastructure and thus gives banks more incentive to engage in open banking either by connecting with TPPs or even acting as TPPs themselves. Their concerns about the risks of significant technology investments with no tangible benefits are giving way to opportunities for leveraging data to create services and improve customer experiences. Fintechs also benefit from data aggregators and intermediaries, as they improve the reliability of data access and help overcome the challenges posed by inconsistent and often low-quality APIs developed by banks. They also enable smaller TPPs to access data without a license, by acting as intermediaries or proxies on their behalf. Representatives from a large data aggregator operating at a European level explained that their platform is instrumental in enabling both banks and TPPs to benefit from economies of scale, which is made possible by data access can be achieved beyond national borders allowing them to connect with other markets. The growing role of data aggregators and intermediaries is a pivotal development in the competitive open banking landscape signaling market maturity and accelerating the emergence of a broader financial ecosystem especially in view of the evolving regulatory landscape.

7.2 Open banking market entry dynamics

PSD2 is a major enabler for new players to enter the payment market. The right to data access under PSD2 is enabling TPPs of all sizes to participate in the market. Mandating banks to provide data access to TPPs is a profound change in the banking industry that opens up opportunities for both banks and non-bank TPPs. The investigation in this report shows that PSD2 is a driver for competition and innovation as new players emerge in the market and offer novel services and experiences for bank customers across different markets. The levelling of the playing field between incumbent banks and new entrants is a central issue in the open banking market[246], affecting both the overall competitiveness of banking services and shaping the dynamics of new entrant market participation. The discussion of the competitive landscape of open banking (see section 7.1 above) offers a nuanced overview of the market, highlighting different perceptions by

[246] Explanatory Memorandum to COM (2023)367 – Payment services in the internal market. https://www.eumonitor.eu/9353000/1/j4nvhdfdk3hydzq_j9vvik7m1c3gyxp/vm4gccye3jyr.

banks and TPPs of PSD2 and how these perceptions affect their positioning. This section aims to further expand on this by outlining market entry dynamics through identifying key entry barriers and opportunities. Table 7 and 8 below offer a comprehensive outline of various categories of entry barriers and opportunities.

Table 7 Outline of entry barriers

Entry barrier category	Components	Description
Licensing requirements and regulatory complexity	Capital Requirements	TPPs must demonstrate sufficient capital reserves to meet regulatory thresholds. Obtaining licenses requires significant investments in compliance resources and expertise such as ongoing compliance costs for dedicated staff to monitor regulatory changes and handling documentation for security protocols and business models. This poses significant barriers for start-ups and smaller Fintechs through limiting their prospects to offer wider range of services and compete in market as well as reinforcing their dependence on banks and larger Fintechs.
	Cross-border compliance complexities	PSD2 allows for economies of scale as TPPs are able to access data across different markets in the EU beyond national borders. However, navigating different national interpretations of PSD2 comes with other complexities, which often corresponds to the necessity of multiple registrations.
	Lack of enforcement and regulatory exemptions	The varying levels of market maturity and openness toward open banking create complexity, because certain markets push against PSD2 and may even want it to be revoked. Other barriers for fair competition and levelling the playing field include the lack of enforcement and inconsistent supervision, improper verification of API quality, and regulatory exemptions by local regulators across different markets. The issue of exemptions is related to alignment between banks and authorities and lax compliance with EBA guidelines to remove API obstacles.
The quality of APIs and data access channels	Functionality and feature limitations	The quality of APIs is a major barrier for TPPs. Poorly designed APIs are often slow, unreliable, and poorly documented. They offer limited features compared to what is offered in banks' customer interfaces and channels, which restrict TPPs from initiating certain types of payments and limiting their service offerings in the market.
	Data completeness and scope	TPPs are faced with data access limitations such as the lack of important details, restricted access to historical transactions, and poor categorization of data. Banks sometimes update data in batches rather than offering real-time access. There are also scope limitations as PSD2 only allows access to payment accounts excluding other important data categories.
	Lack of fallback mechanisms	Banks receive exemptions from providing fallback mechanisms when their APIs fail, leaving TPPs without alternatives. Banks are strict about offering multiple data access channels such as allowing TPPs to access data via bank customer interfaces. Both banks and regulators also push against the use of unregulated methods (such as reverse engineering and screen scraping) due to security concerns limiting TPPs ability to access data and sustaining power asymmetry with banks.
	Lack of bank incentives and API development expertise	Problems that stem from the quality of APIs are attributed to bare-bone compliance by banks. Banks lack the business incentive to develop high quality APIs since they are not paid for data access by TPPs. They also lack expertise in developing open APIs and facilitating external data access.

Entry barrier category	Components	Description
	Service availability	There are also operational challenges for maintenance and trouble-shooting which can disrupt service continuity. These issues affect TPPs' ability to offer enhanced services and compete with incumbent banks.
Technical integration challenges	Inconsistent API implementation and standarization problems	Banks implement APIs differently requiring TPPs to adapt to various bank approaches and pursue custom API integration which creates difficulties in integrating with multiple banks especially across different markets. While there are attempts for standarization, national authorities and financial regulators fail to enforce EBA standards for API implementation.
	Reliance on legacy systems	The development of PSD2 APIs is built based on banks' legacy systems resulting in architectural limitations that constrain API functionality and affect its quality.
	Operational limiations and optimization challenges	Frequent API updates, unreliable performance management, and inconsistent response times to operational problems interrupt integration and affect the development of consistent user experiences.
Bank resistance and competitive dynamics	Bare-bone compliance	Banks exhibit a tendency to adopt minimal compliance strategies that are sufficient to meet regulatory requirements, demonstrating little incentive or commitment to exceeding these baseline standards.
	Business ambivalence	Banks view customer data as significant assets which are reluctant to 'share' with external entities that are perceived as competitors at no gain.
	Lack of financial incentives	Banks have no direct financial incentive to develop good quality APIs and facilitate data access because there is no immediate value or gain for them as they are not compensated for technology investments under PSD2.
	High cost for technology	Banks invest heavily in developing technology infrastructure which is both a financial burden and redirects investments from bank core competencies.
Customer awareness & trust	Customer education	Many customers are unaware about the availability of open banking services and products, and are also unaware that they are using them. This lack of knowledge often results in that customers avoid or refuse using open banking services and products.
	Lack of investments in marketing and external communication	The lack of knowledge by customers is attributed to the lack of investments in marketing and external communication by TPPs to explain their services effectively and how they work to offer convenient customer services that are secure and reliable.
	Building trust and addressing security concerns	Trust is a major factor in banking and TPPs face challenges to gain traction in market and build trust by customers as new entrants without known reputation. This is a significant barrier as TPPs remain dependent on banks who are trusted by customers to increase their market share and customer base. There are also security concerns by customers regarding authentication protocols and requirements, which create friction and increase abandonment rates and discourage them from using the services.

Table 8 Outline of entry opportunities

Entry Opportunity Category	Components	Description
Right to access	Mandated data access	The right to data access under PSD2 made it easier for TPPs to access data, given that banks are required to develop APIs and facilitate access to customer accounts. This removes several obstacles faced by TPPs previously as they used unregulated methods such as screen scraping and reverse engineering.
	Value-added services	TPPs can build value-adding services on top of banking data expanding the scope of basic banking services to include personalized and behavioral-based financial services.
	Enhanced customer services and experiences	TPPs can use data to develop enhanced customer-centric services and experiences. PISPs offer merchants direct account-to-account payments at lower cost, while reducing authentication friction and the number of steps needed for customers to make payments. AISPs offer customers over-views of their finances from multiple bank accounts, personalized financial health metrics, debt analysis and behavioral insights into spending behaviors, and holistic financial visibility.
	Banks-as-TPPs	Banks act as both Account Servicing Payment Service Providers (ASPSPs) and TPPs. As TPPs, banks have right to access data from other banks to use for the development of services and market competition.
Platform business models	Platform integration and embedded services	An outcome of platform partnerships between banks and TPPs can be seen through increased opportunities to integrate and embed TPP services and products within bank internal channels.
	Business model innovation	The shift towards platform integration with TPP services either through connecting to internal bank platforms or developing external platforms is driving the emergence of new business models that impact both banks and TPPs. This shift redirects focus to network externalities and platform competition and innovation.
	Platform partnerships	As the market matures, many banks and TPPs seek partnerships to engage in joint development of services and products enabled by multi-lateral schemes beyond the scope of PSD2. Evolving regulations and the introduction of new collaboration schemes further facilitates bank-TPP partnerships.
Data aggregator platforms	Data connections and aggregator relationships	The rise of companies (such as Tink) enable novel forms of relationships in the open banking market as they connect banks with TPPs and mediate data exchanges among banks, TPPs, and customers. Data aggregators provide platforms that allow TPPs – Fintechs and banks – to connect with and access data from multiple sources overcoming technical barriers (as for example the quality of APIs and technical integration) as well as reduce the cost burden of high technology investments. This also allow merchants and online retailors to access customer data and streamline customer consent. Aggregator platforms accelerate market entry for TPPs.
	Compliance-as-a-Service (CaaS)	Data aggregator platforms facilitate data access particularly for smaller TPPs that can use aggregators' licenses without the need for obtaining the licenses themselves which can be costly and cumbersome.
	Platform-as-a-Service (PaaS) / API-as-a-Service	Data aggregator platforms provide opportunities for TPPs to use technical infrastructure and API resources instead of building it themselves. Data aggregators also possess technical expertise that helps in developing higher API resources and improved access to data, especially with their wide connections with banks across different markets.

Entry Opportunity Category	Components	Description
	Data-as-a-Service (Daas)	Data accessed by TPPs is often unstructured and uncategorized. Data aggregators help TPPs by offering them access to "clean" data that is processed, structured, and organized and developing insights on top of it.
	Economies of scale and faster time-to-market	Using aggregator platforms enable economies of scale as they allow seamless access to data by TPPs and cross-border market expansion. This promotes faster access to market and launch of services.
Niche market entry strategies	Niche service specialization	TPPs as new entrants often target specific use cases or customer segments rather than attempting to compete broadly with incumbent banks. Niche market entry strategies by TPPs focus on entering the market by focusing on niches or services not well-served by incumbent banks.
Technical differentiation strategies	Intuitive interface design and user experiences	TPPs with advanced technological skills can compete on excellence of user experience and the development of intuitive and secure customer interfaces.
	AI integration and advanced analytics	Applying machine learning to extract more valuable insights from the same PSD2-accessible data.
	Cross-platform integration	Building seamless experiences across web, mobile, and emerging platforms
Ecosystem development strategies	Developer platforms and API market places	Building platforms that other developers can use to create PSD2-powered applications.
	Open banking App Stores	Forward-looking banks envision the development of App Stores for open banking services.
Evolving regulations	Regulatory developments	The regulatory landscape of open banking is evolving as new regulations such as PSD3, PSR, and FiDA come into force. These regulations enable TPPs to broader access to data, ensuring better enforcement, facilitating cross-border licensing, and enhancing security standards and protecting customer rights.
	Higher security standards	The promise of new regulations …

7.3 The Quest Toward an Open Banking Ecosystem

Is the banking industry poised to see the emergence of an open banking ecosystem akin to the platform-driven mobile application ecosystems of the tech giants? The answer to this question is that an open banking system is in its formative stages. The regulatory, technical, and business conditions are not ripe yet but continue to evolve. The investigation in this report shows that banks and TPPs envision the emergence of such an ecosystem (i.e. an AppStore of financial services) in which multiple actors engage in mutual co-creation of value[247] and capitalize on network externalities[248] through generative development of payment service innovations.

[247] Mansour & Ghazawneh (2023).

[248] Jacobides et al. (2024); Bonina et al. (2021); Constantinides et al. (2018).

The banking industry is being disrupted by new entrants, albeit the hype about outcompeting incumbent banks may be overstated.[249]

PSD2 and the mandated access to data is enabling market entry for new non-bank TPPs through removing obstacles for them to compete and cooperate with banks in the market. This creates a large network of autonomous, heterogeneous actors[250] equipped with technological skills and competences to develop financial service innovations. TPPs are adopting different entry strategies through direct competition with banks, platform partnerships through service integration, niche services specialization, and technical differentiation. The right to access data in PSD2 is a significant development that accelerates the transition into platform business models[251] and platform competition[252] as thousands of new TPPs and other Fintechs enter the market. This contributes into the development of data-based service platforms such as multibanking and personalized advisory services, digital payments, and alternative financing. The diffusion of these platforms facilitates a platformization of banking[253], and allows banks and TPPs to explore new forms of relationships, business models, and service innovations. Despite the competitive concerns by incumbent banks and the initial compulsive behavior by TPPs, the market is maturing and the view of PSD2 as a compliance burden is transforming and thereby setting the foundation for an open banking ecosystem.

The exchange of data and services among several key ecosystem players such as banks, Fintechs, data and technology providers, regulators, customers, and businesses creates new dynamics and gradually forming what can be considered an emerging open ecosystem. A platform core is an essential component of ecosystems[254], and the rise of technology providers (such as Tink) plays a central role in developing a technical platform infrastructure for the open banking ecosystem. Data aggregators positioned themselves as intermediaries for data and service exchanges among different actors enabling connections between banks, TPPs, and their customers. They also facilitate entry of new players as well as optimize bank-TPP connections by reducing technical barriers (for example the low quality of APIs) and overcoming the financial burden of technology investments. This contributes to improvement of the quality of APIs as well as user experiences which are both vital for ecosystem growth. It also encourages ecosystem actors to move beyond a compliance mindset and embrace platform ideals such as network externalities[255] and mutual value co-creation.[256] Banks are increasingly recognizing the value of partnering with Fintechs, while Fintechs, in turn, appreciate the benefits of collaborating with banks to gain

[249] Larsson et al. (2024).

[250] Bonina & Eaton (2020).

[251] Cennamo (2021); de Reuver et al. (2018)

[252] Staub et al. (2022); Grover & Lyytinen (2022); Cennamo (2021); de Reuver et al. (2018); Cennamo & Santaló (2013).

[253] Alt et al. (2024).

[254] Bonina et al. (2021).

[255] Jacobides et al. (2024); Bonina et al. (2021); Constantinides et al. (2018).

[256] Mansour & Ghazawneh (2023).

market share, trust, and regulatory support, shifting the dynamic from competition to strategic partnership within the open banking ecosystem. The shift in mindset suggests that these dynamics are evolving along with a growing recognition of the value in participating actively in the ecosystem rather than merely complying with the regulations. Banks, as platform owners, typically adopt one of two strategic approaches within the open banking ecosystem. The first is Banking-as-a-Platform (BaaP), where banks consume and integrate services from third-party providers into their own platforms and bank channels. This approach allows banks to expand their product offerings, enhance customer experiences, and remain competitive by leveraging external innovation. The second approach is Banking-as-a-Service (BaaS), in which banks provide their own infrastructure, data, and core banking capabilities to third parties via compliance APIs. This enables Fintechs, non-banks, and other ecosystem players to build and deliver financial services on top of the bank's platform, effectively turning the bank into a service enabler and orchestrator of the infrastructure.

Despite these developments, the open banking ecosystem still lacks certain elements that are found in more mature platform ecosystems. The quality of APIs remains a significant challenge and creates technical friction among ecosystem actors, which slows down the development of service innovations and constrains mutual interactions. There also exist tensions between regulatory mandates and business incentives. Banks as platform owners are generally cautious about open banking, particularly in the absence of immediate value for them, and tend to focus on balancing compliance requirements with protecting their market position. The development of "poor APIs" is a significant barrier for attracting third-party autonomous complementors and enabling fair competition, which is central for platform growth through complementary value propositions by TPPs.[257] These issues affect the levelling of the playing field among the different actors as they present constraints for the growth and expansion of the ecosystem. Although an even relationship among actors in established mobile ecosystems is not the goal, power asymmetries (e.g., capital, market share, technology prowess) between banks and TPPs in an open banking ecosystem can be catalyst for both competition and partnerships. It creates novel competition dynamics as different parties attempt to navigate these imbalances strategically, leveraging their strengths to co-create value while negotiating control and influence within the evolving ecosystem.

The current state of the open banking ecosystem is further marked by a lack of central orchestration.[258] Unlike more established platforms such as iOS or Android, open banking operates without a central coordinating entity. As a result, multiple and often fragmented orchestration models have emerged, leading to inconsistencies in integration, governance, and user experience across the ecosystem. For instance, incumbent banks have their own BaaP- and BaaS-models to offer API resources and consume external TPP services. There are also data aggregators and

[257] Jacobides et al. (2024); Hein et al. (2020); Kretschmer et al. (2020).

[258] Hein et al. (2020).

other Fintechs that provide platform infrastructure and APIs for data access. Data aggregators, in particular, created a new competitive layer in the ecosystem as they compete to orchestrate reliable connections and offer novel services such as PaaS, DaaS, and CaaS. Platform governance and coordination are central in ecosystems as platform owners provide a core platform and resource incentives as well as facilitate value exchanges among different actors.[259] At the same time, the lack of central orchestration or coordinated orchestration[260] creates friction that makes it challenging for ecosystem players to easily discover and access data and services.

The evolving regulatory landscape could mitigate orchestration challenges, because open finance regulations (for example FiDA) broaden the scope of data access beyond payment accounts to include a broader range of financial data and services. The introduction of technical standards and schemes can help to establish consistent and reliable connections among ecosystem participants. However, the question of the commercial sustainability of the ecosystem also remains unsolved. Finding viable business models (i.e. BaaP, BaaS) that fairly distribute value among ecosystem participants will be crucial for long-term sustainability. Big Tech competition[261] leads to new competition dynamics as incumbent banks attempt to partner with Fintechs as a defensive strategy against external threats of big tech offerings of financial services. This can be regarded particularly disruptive of the competitive landscape, due to both Big Tech and Fintechs use of technical differentiation as a strategy to gain market share and customer trust through enhanced and secure services. Incumbent banks may increasingly find themselves vulnerable, as they struggle to keep pace with the innovation and customer-centric offerings of more agile tech-driven competitors. In conclusion, the open banking ecosystem is still in its formative stages, characterized by evolving relationships between banks, Fintechs, and technology providers. While regulatory initiatives have laid the groundwork, the full potential of this ecosystem will depend on continued technical innovation, evolving business models, and a shift toward more platform thinking among all participants.

7.4 Major Observations and Recommendations

- PSD2 helps level the playing field in the payments market. However, power imbalances persist, as third-party providers (TPPs) remain dependent on banks and struggle with limited market share and customer trust. PSD2 services are not as widespread as bank services. A key indicator is the use of the instant payment service Swish[262], which is owned by incumbent banks in Sweden, with

[259] Schreieck (2024); He et al. (2023); de Reuver et al. (2018); Ghazawneh & Henfridsson (2013).

[260] Ibid.

[261] Gawer (2022); Padilla (2020).

[262] Swish. Om Swish. https://www.swish.nu/om-swish

a total of almost 1.1 billion payments in 2024. A survey conducted by Finansinspektionen [263] on Open Finance shows that only between 100 and 150 million payments were made using payment initiation in 2022.[264] In another report by Riksbank, Swish accounts for 45 percent of all credit transfer payments and 37 percent of all bank payments.[265] This aligns with observations made in this investigation as TPPs still face obstacles to offer competitive payment services, despite the regulatory mandate requiring banks to facilitate data access. There is a significant gap in the number of payment services offered by banks compared to TPPs. To ensure a more equitable and dynamic payments market, it is crucial to address the regulatory gaps and exemptions that contribute to disparities in service offerings between banks and TPPs. Strengthening oversight mechanisms and encouraging collaborative, multilateral schemes that fairly compensate all market participants can help foster a more inclusive and vibrant ecosystem.

- API agnosticism is a primary cause of the lack of multiple data access channels hindering opportunities for smooth access to data by TPPs. The reliance on compliance APIs as primary data access channels is creating friction in the market and causing technical integration problems, which is resulting in obstacles for TPPs to develop and offer enhanced services that can compete with bank services. While PSD2 mandates banks to offer dedicated interfaces for guaranteed access, bare-bone compliance strategies seem to result in low-quality APIs making it difficult for TPPs to leverage the data effectively. The use of alternative, unregulated methods (such as screen scraping and reverse engineering) by TPPs is met with resistance from banks due to concerns over security, data integrity, potential loss of control over customer data, and the lack of incentives to exchange data with TPPs. FI notes that the use of both regulated and unregulated data access methods is problematic, since data access is guaranteed and data retrieval is not regulated.[266] To foster fair competition and unlock the full potential of open banking, it is essential to embrace multi-channel data access strategies, robust fallback solutions, and standards for reliable data interoperability. These measures are vital for overcoming the technical barriers posed by API agnosticism, ensuring that TPPs can access data reliably. By leveling the technological playing field, such approaches support innovation, enhance service quality, and uphold the spirit of PSD2 to promote competition and innovation.

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[263] Finansinspektionen. Open Finance in Sweden. *Report,* 2023-06-28. https://www.fi.se/en/published/reports/reports/2023/open-finance-in-sweden/

[264] Swish reported 900 million payments under 2022.

[265] The Riksbank. Swedish payments infrastructure priorities in a rapidly changing payments. *Economic Review 2024, no. 1.* https://www.riksbank.se/globalassets/media/rapporter/pov/artiklar/engelska/2024/2024_1-swedish-payments-infrastructure-priorities-in-a-rapidly-changing-payment-landscape.pdf

[266] Finansinspektionen. Open Finance in Sweden. *Report,* 2023-06-28. https://www.fi.se/en/published/reports/reports/2023/open-finance-in-sweden/

- Both banks and Fintechs currently lack clear strategies and frameworks for collaboration and partnerships under PSD2. This lack hinders the evolution of the open banking ecosystem, which presents opportunities for banks and third-party data aggregators to position themselves as orchestrators of value co-creation, and for TPPs to gain better, and more sustainable participation in the market by leveraging economies of scale. There is increasing recognition by all parties regarding the importance of platform ideals such as value co-creation and the ability to leverage network externalities. To unlock these benefits, banks should adopt a more proactive approach to open banking not only to expand the ecosystem, but to play an active role in orchestrating technological infrastructure, ecosystem interactions, and the development of innovative and sustainable business models. At the same time, TPPs should move beyond short-term gains or quick exits through acquisition, and instead, shape a clearer long-term vision for their role in the ecosystem as third-party complementors. To cultivate an economy of complementarities in the new emerging open banking ecosystem, a shared commitment by both banks and TPPs is necessary for driving a competitive market based on collaboration, transparency, and mutual value creation.

- The growth of the open banking ecosystem, thus, relies on the availability and diversity of complementary services developed by a wide range of ecosystem actors. However, customer awareness of open banking remains limited, as customers are unclear about what data is being accessed, how it is used, and by whom. This lack of transparency contributes to reluctance in adoption and undermines trust in TPPs. Moreover, the customer consent process is fragmented and inconsistent across platforms that creates confusion and sub-optimal customer experiences. To accelerate the adoption of open banking services, TPPs must prioritize strategies that build customer trust and clearly communicate the value of their offerings. This includes implementing targeted marketing efforts focused on user benefits and transparent data usage, as well as developing interfaces that allow users to explore available services—such as payments, account aggregation, and financial management—through intuitive, user-friendly platforms. There also exists an urgent need to standardize customer consent flows to ensure a seamless and trustworthy user experience. Security certifications, transparent communication, and visible partnerships with incumbent banks can further strengthen credibility in the eyes of consumers. The absence of ecosystem orchestration is a major barrier to building customer awareness and trust—coordinated efforts are essential to align standards, streamline experiences, and present a unified vision of open banking that resonates with customers.

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