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FINTECH AND DATA ACCESS:
THE RISE OF PRO-COMPETITIVE REGULATION

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ABSTRACT

The thesis investigates how competition policy and modern forms of regulation can tackle the economic challenges posed by financial technology (FinTech) and current data bottleneck problems. By looking at the data sharing regulatory measures enacted in the EU with the Payment Service Directive (PSD2), the Open Banking projects in the UK, Australia and other jurisdictions, the manuscript argues that sector specific regulation hinged on a pro-competitive paradigm can be a better option to unlock the potential of FinTech innovation than traditional antitrust law.

The thesis contributes to the literature by providing a comprehensive legal and policy analysis of different regulatory toolkits (such as regulatory sandboxes and innovation hubs) and new pro-competitive strategies developed so far by policy makers (such as Open Banking and Open Finance). The thesis evaluates the extent to which functional regulation can bear the challenges posed by FinTech non-banking financial intermediation as well as the potential of Open Banking to tackle consumer disengagement in retail financial markets.

By reflecting on the limits of traditional competition enforcement to tackle consistently the issue of data access, the thesis highlights that the main European regulatory initiatives that have so far surfaced in the realm of data governance embrace a pro-competitive paradigm. The argument is assessed against the most recent EU legislative interventions involving the right to personal data portability, free flow of non-personal data, access to customer account data rule, and re-use of government data.

After providing an insight into how the access to account (XS2A) rule introduced by the revised EU Payment Service Directive (PSD2) and the Open Banking strategies have been developed and enacted, the manuscript focuses on the technical and economic hurdles that may jeopardize the workability of these measures. The thesis argues that standardization of Application Programming Interfaces (APIs) together with government-driven actions are key to deliver adequate levels of interoperability across the market. Against this background, the pro-competitive initiative on data access adopted by the UK with the Open Banking project can represent a blueprint for harnessing the competitive potential of data-driven innovation in sectors of the digital economy other than the financial industry.

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INTRODUCTION

A. Setting the scene

The increasing pace of innovation in technology applied to financial and banking services ("FinTech") is set to have a radical impact on the traditional ways of providing financial services[1]. This evolution is shaping the future of the financial sector, offering numerous potential benefits for European consumers, businesses and citizens. FinTech developments are likely to transform fundamentally how undertakings compete and how customers interact with financial providers. Thus, a clear understanding of the new competitive dynamics and the consequent changes in financial market structures is required in order to understand what contribution antitrust can make to the discussion[2].

FinTech-enabled innovation raises significant expectations in terms of ameliorated consumer welfare and competitive pressure. The retail banking sector has traditionally been affected by low elasticity of demand, consumer stickiness, lock-in problems and abuse of economic power by incumbents. As a consequence, powerful, more established banking firms have not only been able to retain stable and extensive market shares, but have also been substantially free to engage in bundling and tying practices to the detriment of the competition and, ultimately, of consumer welfare.

So far, numerous financial fields have been affected by FinTech developments, including digital banks, regulatory technology (use of new technology to facilitate compliance with regulatory requirements), personal finance and wealth management[3]. New technological breakthroughs (such as digital identification, big data analytics, machine learning, mobile applications, artificial intelligence, and distributed ledger technologies) are driving the emergence of new players aiming to gain new positions within the financial value chain[4].

From an industrial organisation perspective, FinTech has the potential to unbundle the core functions of banking (drawing savings, settling payments, providing loans and sharing risk). This development has a dual aspect. On one side, it has the potential to strengthen competition, thereby benefiting both consumers and businesses. Suffice to say that bespoke price comparison applications offered by FinTech providers relying on interoperability communication standards will strengthen consumer bargaining power with banks and financial operators. Indeed, by increasing price transparency within the market and facilitating switching between rival firms, new FinTech players may contribute to

[1] European Commission (2018h), 8.
[2] Hoffmann, Bakhoum, Beneke (2018), 5.
[3] Chiu (2017), 55.
[4] European Banking Authority (2017g); Zetzsche, Buckley, Arner, Barberis (2018), 11 s.

reducing consumer "stickiness" problems that currently chronically affect the retail banking markets. On the other side, such an increase in competition within the banking market runs the risk of jeopardising financial stability and undermining depositors trust. As the banking system is extremely fragile and highly sensitive to endogenous shocks, any developments likely to disrupt it significantly should be duly evaluated beforehand by both financial regulators and competition agencies.

One of the most fascinating breakthroughs arising from FinTech is represented by the innovative use of data in the financial sector[5]. Even though this phenomenon is not new, the cutting-edge applications offered by technological innovation can significantly impact and reshape financial services. Retail banking services are awash in data. All kinds of financial services and products may be affected, as the use of big data technologies could serve various purposes, from customer profiling and identification of consumption patterns to make targeted offers and to customise products and services, to the support of finance and risk control activities[6]. Many of the business methods hinged on FinTech innovation rely upon the original use of customer data, such as personal budgeting, insights into personal expenses, tailored financial reporting and price comparison applications. It follows that access to consumer account data is essential for undertakings providing these kinds of services.

In light of this, regulators and scholars are attempting to shed light on the challenges brought about by big data use in the financial sector in terms of consumer protection and competition. The retail financial services sector is one of the areas in which this clash is having a significant and worrying impact. Financial players can collect extensive information on the willingness of consumers to pay for the product and on their risk profile, thus allowing them to develop behaviour-based services. In the insurance and banking sectors, the ability to assess more correctly the risk of granting credit to consumers may be better understood and, accordingly, priced more accurately, leading to improved credit conditions for certain customers. Due to the increasing availability of detailed data on users and their behaviours, firms are now able to refine their prices with greater accuracy[7].

In order to nurture FinTech innovation and gather developers worldwide, several jurisdictions have engaged in heated forms of regulatory competition. More specifically, FinTech hubs have already been established in Canada, Hong Kong, Japan, the US and Australia. They consist of institutional agreements facilitating coordination between businesses and competent authorities to shed light on the most recent technological breakthrough and their business implementation[8]. Under these schemes, firms can seek clarification on the legal conformity of certain business methods or the most suitable

[5] European Parliament (2017), 16.
[6] European Supervisory Authorities (2016), 8-10.
[7] Milanesi (2017).
[8] For an application to blockchain and smart contracts, see Finck (2017); Borgogno (2019).

licences and certifications to be obtained in order to provide specific financial products. Many supervisors have established regulatory sandboxes in order to test new innovative services in conjunction with developers and businesses. By means of this new regulatory strategy, undertakings can test specific services, products or business practices under a legal framework that differs from the one with which they would otherwise need to comply under normal circumstances.

In the current climate, numerous challenges are posed by big data analytics to competition policy and antitrust enforcement. The retail financial services sector is one of the areas in which this clash is having a significant and worrying impact. Financial players can collect extensive information on the risk profile of consumers and develop behavioural-based services. Due to the increasing availability of detailed data on consumers and their patterns of behaviour, firms now have the opportunity to refine their prices with greater accuracy[9]. Moreover, big data analytics allow data (even anonymised) to be traced back to an individual, enabling the commercial exploitation of such data[10]. This development is driving innovation in the banking and financial landscape. The potential applications of big data analytics, together with new FinTech-enabled business models, can improve the competitiveness of both traditional banking institutions and newcomers.

The competitive threat arising from FinTech not only involves start-ups, but also big-tech firms. Over the years, companies such as Facebook, Google, Alipay and Apple have gathered substantial digital datasets and tremendously improved their big data analytics skills in leveraging consumer data to deliver tailored services. Not surprisingly, in recent years they have shown an increasing interest in entering the financial and banking markets by bundling new services together with their core products.

Traditional banking players holding significant market shares fear that they may lose their power due to the new FinTech players[11]. They therefore have a strong incentive for stopping new entrants from accessing the market on a level playing field. This problem is further exacerbated when considering that the vast majority of services delivered by FinTech players are dependent on upstream traditional banking markets. On top of this, the complex technical environment underpinning digital financial platforms enables banks and incumbents to engage in subtle forms of foreclosure practices aimed at driving potential new competitors out of the market.

In this respect, the payment service market is worth investigating as a clear example of the interplay between technological disruption and competitive issues. Settlement and payment systems are the

[9] Milanesi (2017).
[10] Valcke, Vandezande, Van de Velde (2015).
[11] Vezzoso (2018), 30.

backbone of the global financial system: they guarantee the smooth flow of funds between households, businesses, financial intermediaries, and central banks[12]. This sector lies at the forefront of FinTech innovation and has, over the years, attracted the attention of policy makers and competition authorities in many leading jurisdictions.

B. Scope of the research

B.1. Research questions

This thesis aims to address two central research questions with two related sub-questions:

Question 1: What role is played by regulation in addressing the economic challenges underlying the rise of financial technology?

Sub-question: How has the regulatory toolkit been evolving in order to harness the pro-competitive potential of technological innovation?

Question 2: Can pro-competitive regulation contribute to the development of a data governance framework able to foster competition within the financial sector?

Sub-question: Can the European Open Banking regulatory experience based on enhanced interoperability be used as a blueprint for data governance frameworks in other sectors?

In order to answer these questions, several sub-questions must be addressed. Firstly, an understanding must be gained of the impact that financial technology is having within the financial sector in order to have an overall picture of the current economic dynamics characterising the industry. Secondly, it is also important to examine how the market structure is reacting to the disruption led by financial technology both on the supply and demand side. In order to tackle the main regulatory and legal questions in this regard, it is useful to perform a preliminary assessment of the different kinds of players that can harness the potential of financial technology (from start-ups to incumbent banks and Big Tech companies). The role played by technological innovations for the evolution of the shadow banking system is equally crucial to gain a comprehensive understanding of the industry. These notions are central to the discussion of the issue surrounding the implementation of financial technology and data-enabled services.

The thesis will tackle the issues surrounding the main research questions separately. It will firstly address the issue of the kind of regulatory strategies that can be adopted to tackle the problems

[12] Armour et al. (2016) 281.

surrounding financial technology development. Any discussion on how to improve the approach to competition policy to address the competitive challenges affecting the financial sector needs to start from a clear systematisation of the regulatory toolbox that has emerged thus far. As policy makers, supervisors and scholars have been suggesting new tools and strategies (so-called "regulatory experimentalism") for the last six years, it is useful to provide some clarity on how the different strategies may be successfully coordinated. Next, the thesis will explain the features of the pro-competitive regulatory paradigm and the reasons why financial technology represents one of the best battlefields for testing its potential.

Finally, in assessing the upsides and downsides of pro-competitive regulation, the thesis will focus on the financial data access rule enshrined in the Payment Service Directive (PDS2). By looking at the deficiencies of traditional antitrust enforcement, the work will illustrate how the European Union has made use of pro-competitive regulation to tackle the data bottleneck problem affecting the retail payment system. This real case scenario will serve as the basis for highlighting the crucial importance of standardisation for the smooth functioning of data sharing mechanisms. The thesis will then answer the question as to how pro-competitive regulation harnessing financial technology can increase consumer welfare, but also ease monopolisation behaviours by Big Tech companies. The final question addressed by the thesis is the extent to which the pro-competitive paradigm to data sharing is proving useful in other sectors, such as government-to-business data sharing and personal data portability.

B.2. Methodology

The thesis will use the normative and doctrinal legal methodology in answering the research questions. It will present, from a normative perspective, the optimal implementation of pro-competitive regulation which would secure the interests of both consumers and market players. While the core of the work builds on desk research, the analysis will be based on empirical evidence gathered by scientific literature, competition agencies, central banks, renowned research centres, and government agencies.

The normative approach will be complemented by a positive comparative analysis of different jurisdictions, with a focus on the EU and the UK. These jurisdictions have seen the rise of financial technology, and market authorities are slowly developing strategies and principles on how to cope with the challenges posed by technological innovation and data governance. As FinTech development is a global phenomenon, it is crucial to compare and contrast the approaches taken by policy makers

in the EU and the US to ascertain some universally applicable principles on how to build a competition-sensitive data governance framework.

The thesis will also analyse FinTech issues from the perspectives of financial regulation, comparative law and competition law. Financial technology and data governance are complex notions that intersect all three legal disciplines. A complete understanding of the regulatory treatment of financial technology requires a comprehensive analysis of these three legal disciplines and an examination of their role and influence in shaping the competitive dynamics of the market.

B.3. Limitations

The thesis necessarily has some limitations. As the title suggests, it mainly deals only with issues of financial technology regulation and competition policy, with a strong emphasis on the pro-competitive paradigm; therefore, a large number of matters closely related to financial regulation and data governance are outside the scope of the thesis. For example, the thesis does not address the various cyber security and privacy issues that may arise within open banking environments. Similarly, the thesis does not delve into the treatment of potential collusion from the side of banking incumbents aimed at jeopardising the functioning of pro-competitive mechanisms. Such issues are broadly covered in existing competition law textbooks. Similarly, national security concerns stemming from the dissemination of consumer data throughout the market are not investigated in this work.

Aside from the substantive matters, the implementation of data sharing mechanisms also includes highly technical regulatory activity by supervisors and government agencies. For instance, under the European Union's legal framework, the European Banking Authority is given the task of liaising with the authorities of the Member States in order to develop a common European rulebook composed of technical standards and regulatory technical standards[13]. These issues can only be properly evaluated in the context of a highly detailed analysis that may see the research work transform into an esoteric commentary of little interest to the legal academic community. Therefore, the thesis will focus on the substantive issues related to the new avenues of experimental regulation in the face of financial technology innovation and data governance, leaving aside many process questions.

A final limitation relates to the choice of jurisdictions. FinTech innovation is a global phenomenon, and almost every jurisdiction needs to address the competitive issues raised by data bottleneck problems and technology-enabled competition. However, the European Union and the United Kingdom are at the forefront of pro-competitive regulation and data governance. The United States

[13] Cappiello (2015).

is also interesting when it comes to experimental regulation in the context of FinTech, but it has thus far taken a laissez faire approach with reference to data-enabled innovation. The Australian experience, on the other hand, is remarkably interesting and will be considered along with other Asian countries in order to provide a comprehensive comparative assessment of the matter. However, a more thorough analysis of the Asian jurisdictions would require the input of a researcher with suitable knowledge of the relevant legal systems, as well as familiarity with the local languages. As most policy makers throughout the world are closely following the development of the European pro-competitive regulatory experiences, the choice of the EU and the UK as the examined jurisdictions still allows for some universally applicable principles to be established on how to achieve competition-sensitive data governance.

B.4. Contribution to the literature

The thesis aims to contribute to the existing literature in several ways. Firstly, the work contributes to the discussion on how to update the regulatory toolkit of supervisors and policy makers in a way that harnesses FinTech innovation. As there are many contributions to the literature on regulatory experimentalism and numerous scholars and regulators have suggested new tools for putting technological innovation to good use for society, there is a clear need for general systematisation. Such abundant literature is scattered across individual policy documents and articles. Most of these contributions are inherently limited as they deal with only one component of FinTech regulation (sandboxes, hubs, traditional antitrust enforcement, etc.), they analyse the issue from the perspective of only one area of law (consumer protection, financial regulation or competition law) and they frequently support a particular policy outcome (financial stability, competition or consumer welfare).

The thesis, by contrast, provides a comprehensive analysis of all elements of FinTech regulation that have emerged so far against the current financial market structure where traditional banks face the competition of shadow banking systems. Therefore, the work aims to assist policymakers, public officials, entrepreneurs and companies in interpreting the future development of the regulatory legal framework involving data governance and FinTech innovation.

Secondly, the thesis makes a contribution to the literature by putting forward the new paradigm of pro-competitive regulation as the most advanced frontier of technology regulation at the interplay of competition policy, data governance and financial regulation. The original contribution to the state of the art made by this manuscript is to show how policy makers can address economic structural deficiencies by means of tailored rules able to foster competition. By looking at the PSD2 experience

and the ongoing Open Banking remedy adopted by the Competition and Market Authority in the UK, the work will critically assess the upsides and downsides of pro-competitive regulation. Finally, the thesis will also provide its solutions with the aim of demonstrating that the PSD2 experience can be regarded as a blueprint for building competition-sensitive data governance also in other sectors, increasing consumer welfare and market contestability. The thesis also contributes to the field of comparative law by comparing and contrasting different approaches to FinTech regulation in the US and the EU.

Further proof of such contribution is the fact that the thesis builds on the articles I managed to publish on renewed peer-reviewed academic journals throughout my four-year doctoral research.[14]

C. Structure

The thesis is divided into two parts. Part I provides a background which is necessary for understanding the issues discussed in the remainder of the thesis. Chapter 1 illustrates the economic context against which financial technology has emerged, by looking at the competitive dynamics of the financial markets and at how the challenges of the shadow banking system have been addressed thus far. The chapter aims to provide an introductory framework of the FinTech landscape and its general impact on the financial sectors. The work highlights the increasing role played by FinTech innovation on credit lending. Currently, this sector is worthy of consideration as it highlights the regulatory trade-offs that come hand-in-hand with the willingness of policy makers to nurture technological innovation and the need to preserve financial stability, as well as to protect the level playing field between incumbents and new entrants. Finally, the chapter offers a comparative overview of the approaches adopted by different European jurisdictions in tackling non-banking credit recently boosted by FinTech innovation. By building on this analysis, the chapter evaluates how policy makers can adjust the regulatory perimeter to reap the benefits of FinTech innovation.

Chapter 2 offers a comprehensive systematisation of the regulatory toolkit developed thus far by scholars, policy makers and supervisors in order to harness the benefits of FinTech while minimising the risks posed to financial stability, consumer protection and privacy. The chapter will explain how the paradigm of pro-competitive regulation fits into the current regulatory toolbox and enables regulators to address the competitive challenges posed by technological innovation. The chapter looks at the regulatory approaches to FinTech that have emerged thus far and positions them in a systematic framework. Firstly, it provides a categorisation of the main regulatory strategies that legislators on

[14] The relevant articles are duly cited at the beginning of each chapter.

both sides of the Atlantic can enact to tackle the challenges of FinTech innovation. Attention is paid to experimentation tools such as innovation hubs, regulatory sandboxes, special FinTech charters, and mentorship regimes. Secondly, the new emerging trend of responsive regulation (or smart regulation) is investigated together with its main downsides. The European Union and the United Kingdom stand out as leading testing grounds of these new strategies. Finally, the chapter introduces the concept of pro-competitive regulation as the most advanced stage of a policy strategy aimed at harnessing the potential of FinTech while countering its risks to public welfare.

Part II focuses on the real-world implementation of pro-competitive regulation to data sharing. Chapter 3 outlines how such a new innovative paradigm emerged from the evolution of payment services regulation in the European Union and culminated in 2015 with the access-to-account rule enshrined in the Revised Payment Service Directive (PSD2). The chapter comprehensively presents the rationale behind this regulatory initiative and the reasons it was preferred over antitrust enforcement to overcome the financial data bottleneck problem. Finally, the chapter looks at the key role played by standardisation in ensuring the smooth implementation of data access by looking at the experience of the United Kingdom, various states of the European Union, Australia and other jurisdictions.

Chapter 4 provides a critical assessment of the competitive impact arising from the regulatory endeavours undertaken by the European Union and the United Kingdom with reference to the implementation of financial data sharing through pro-competitive regulation. By drawing on the theoretical framework developed in the previous chapters, as well as the details of PSD2 implementation, the thesis develops some of the most challenging issues that policy makers need to address when identifying competition policy in the face of Open Banking-enabled data sharing ecosystems. In particular, this chapter is divided into two sections. The first deals with the impact of pro-competitive regulation on consumer welfare in retail banking. The second analyses some possible regulatory reactions to the potential entry of BigTech firms into the financial sector with reference to the competitive dynamics of Open Banking.

Chapter 5 sheds light on the role and regulation of Application Programming Interfaces (APIs) for enabling data sharing across the market. APIs have been identified by the European Commission as a key enabler of interoperability between private and public undertakings. Furthermore, a systematic adoption of open and standardised APIs by firms and developers appears crucial to unlock competition and ultimately promote the success of Artificial Intelligence (AI) and Internet of Things (IoT) innovation. In analysing the main European regulatory initiatives which have come to light thus far in the realm of data governance, other than the access to customer account data rule (right to

personal data portability, free flow of non-personal data, re-use of government data), the chapter highlights that the EU legislator is not taking a consistent approach to tackling the matter. Indeed, on one side, all these initiatives rely strongly upon APIs as a key facilitator for guaranteeing a sound and effective data sharing ecosystem. However, on the other side, all these attempts are inherently different in terms of rationale, scope and implementation. The chapter stresses that data sharing via APIs requires a complex implementation process and sound standardisation initiatives, which are essential for its success. As for pricing and compensation issues, the chapter highlights that placing excessive reliance on fair, reasonable and non-discriminatory (FRAND) terms might be counterproductive. Ultimately, the thesis conclusion provides an overview of the research results and discusses the policy implications arising from the thesis.

The thesis was finalised on 31st January 2021 and includes the cases, legislation, literature and data available up until that point.

Part I. Pro-Competitive Regulation and FinTech

Chapter 1 - The impact of technological innovation on the financial sector

Short abstract of the chapter

The aim of this chapter is twofold. Firstly, it aims to provide an introductory framework of the FinTech landscape and its impact on the financial sector at large. Secondly, the chapter stresses the increasing role played by FinTech innovation on credit lending. Currently, this sector is worthy of consideration as it highlights the regulatory trade-offs that go hand-in-hand with the willingness of policy makers to nurture technological innovation and the need to preserve financial stability along with the level playing field between incumbents and new entrants. Finally, the chapter offers a comparative overview of the approaches adopted by the different European jurisdictions in tackling non-banking credit recently boosted by FinTech innovation. By building on this analysis, the chapter evaluates how policy makers can adjust the regulatory perimeter to reap the benefits of FinTech innovation.

1.1. Setting the scene: the rise of FinTech

Over the last decade, the financial industry has entered an accelerated transformation process powered by breakthroughs in information and communication technologies. The use of technology to provide financial services ("FinTech") is not a new phenomenon, having been a key part of financial innovation throughout the whole history of finance[15]. However, over the last 150 years, its impact on the financial markets has increased tremendously in importance. From the introduction of the telegraph in 1838 and the first transatlantic cable in 1866, technological innovation marked the

[15] Chiu (2017); Athanassiou (2018), 19-54. Zetzsche, Buckley, Arner, Barberis (2018) make a distinction between TechFins and FinTechs: while the former relies on large-scale data sets and businesses developed in their primary course of business and then put them to use in financial services, the latter is focused on finance first and the application of technology to deliver improved financial services. On the European origins of digital finance, see Zetzsche, Buckley, Arner, Barberis (2019) and Arner, Barberis, and Buckley (2017).

development of the global financial markets throughout the 19th century[16]. Similarly, the automatic teller machine introduced by Barclays in 1967 was one of the biggest financial innovations in the banking sector[17]. From 1987, traditional regulated financial players progressively based their activity on digital infrastructures and electronic communication[18]. Since then, the financial industry has become the top purchaser of IT products worldwide and technological innovation has become essentially important throughout the whole range of services traditionally delivered by financial intermediaries. Despite this transition raising predictions that direct finance would disrupt costly and inefficient financial intermediation and professional indirect finance, many wonder whether the current wave of innovation is not a simple case of *déjà vu*[19]. That said, it is too early to predict how the market structure for financial services will unfold over the next decade. In order to provide a coherent normative framework for the topic, the following section provides an economic analysis of financial technology and its main triggers.

As mentioned, technological developments facilitate the unbundling of financial services, which have traditionally been conceived as being provided only by banks and financial conglomerates alongside taking deposits and providing credit. This means that new non-banking firms are entering the financial markets by providing either new FinTech-enabled services or some of the services traditionally provided only by banks (such as credit and loans, as discussed in Section 2 of this chapter). Indeed, empirical research has found that FinTech services are becoming widespread among retail customers in specific market niches all around the world (e.g. crowdfunding, cross-border payments, P2P lending, financial services targeted at unbanked individuals who lack a credit history)[20]. The financial system arena is becoming crowded and forms of either cooperation or competition with incumbent financial intermediaries are developing, depending on the circumstances. For instance, digital platforms and electronic aggregators are acting as distribution channels of financial services, while robo-advisors are harnessing customer information and digital footprints (i.e. traces made of writing texts about oneself) in order to provide tailored services to consumers.

In light of this vast potential, financial technology is expected to provide benefits in terms of competition, efficiency, transparency, and financial inclusion[21]. Firstly, by facilitating the entry of new firms and by unlocking competition within retail banking markets, FinTech can promote the

[16] Arner, Barberis, and Buckley (2016).
[17] Shepherd-Barron (2017).
[18] Arner, Barberis, and Buckley (2016).
[19] Dermine (2016).
[20] Buchak, Matvos, Piskorski, and Seru (2018).
[21] See, for example, Expert Group on Regulatory Obstacles to Financial Innovation (2019), 10 and 90-92; Financial Stability Board (2017). See also Berg, Burg, Gombović, and Puri (2019); Vives (2017).

offer of new and more tailored products and services, and curb the so-called "loyalty penalty", which happens when longstanding customers bear higher prices than more customers engaged more recently for the same services[22].

Secondly, FinTech-based solutions may enable access to finance through new means and at a lower cost, promoting financial inclusion, by exploiting digital technologies and widening the offer of products and services. Notably, FinTech can open up certain products to individuals who were previously unbanked or not under the radar of traditional banking services. This stems from better profiling techniques and credit scoring based on cross data analysis. Furthermore, FinTech-enabled by-products, such as price comparison tools and interoperability, can mitigate consumers' unwillingness and inability to switch between firms and to shop around to find the best deals[23]. Thirdly, by entrusting consumers with augmented switching powers enabled by data-driven solutions, the market may benefit from increased integration and operational efficiency[24]. Finally, since FinTech removes intermediaries from the financial supply chain, it decreases financial friction by facilitating the more efficient provision of financial services. Indeed, the impact of financial shocks can be substantially weakened by FinTech diversification and decentralisation[25]. Accordingly, transparency diminishes information asymmetries, thereby enabling more accurate pricing and allocation of risk throughout the market.

Having said that, it must be acknowledged that the systematic digitalisation of financial transactions also comes with risks. It is likely that the threat of discrimination, manipulation and exploitation of vulnerable customers will take centre stage, together with those risks traditionally related to the potential lack of financial education[26]. Indeed, due to the high levels of opaqueness characterising algorithm-based decisions, consumers may be exposed to ambiguous and overly complex decision-making mechanisms. Furthermore, persons who are un-networked and do not use technologies for various reasons (e.g. lack of digital literacy, lack of accessibility to digital devices, lack of trust in digitalised services) could be denied access to financial services. Moreover, the digital financial transformation increases the exposure to risks of data breaches and fraud, which may undermine confidence and represent a threat to the stability of the financial system. Hence, both cybersecurity

[22] UK Competition and Markets Authority (2018). See also Oscar Borgogno and Giuseppe Colangelo (2020b).
[23] Canadian Competition Bureau (2017).
[24] See European Commission (2018e), 2, arguing that FinTech can prove to be beneficial for the establishment of the EU Capital Market Union.
[25] Financial Stability Board (2017).
[26] European Commission (2018e), 2-3. See also European Banking Authority (2019c).

and data protection have become sources of systemic risk in the financial system which regulators need to address carefully[27].

1.1.1 Background and definition

The convergence of technology and the financial sector has a long history[28]. However, in the past decade, the exponential growth in the digital economy has led not only to the disruption of several industries (advertising, media, retail and wholesale business) but has also had a major effect on the financial sector[29]. From the perspective of competition policy, FinTech innovation is set to influence the market structure through three main channels.

First, technological developments facilitate the provision of financial services, which have traditionally been conceived as being provided by banks and financial conglomerates. Indeed, empirical research has found that FinTech services are becoming widespread among retail customers in specific market niches all across the world (e.g. crowdfunding, cross-border payments, P2P lending, financial services targeted at unbanked individuals who lack a credit history)[30]. Second, digital platforms and electronic aggregators are acting as distribution channels of financial services, and robo-advisors are harnessing customer information and digital footprints (i.e. online traces made of writing texts about oneself) in order to provide tailored services. Moreover, firms can make use of FinTech to perform domestic and cross-border payment services (by means of pre-funded e-money or digital wallets), retail and commercial banking (by establishing innovative lending and borrowing platforms), customer relationship activities (by providing price comparisons, switching services and credit risk ratings), wholesale banking and markets, wholesale payment, clearing and settlement infrastructure[31].

Last but not least, the lending sector is set to be radically disrupted by big data analytics and new platform-based business methods. Indeed, strong competitive pressure is likely to arise as a wide range of lending platforms enters the market, including marketplace lenders and P2P[32]. By harnessing big data analytics, machine learning algorithms and alternative data sources, these new players aim to fulfil the unsatisfied demand for loans to individuals and SMEs[33].

[27] Buckley, Arner, Zetzsche, and Selga (2020).
[28] Brummer, Gorfine (2014).
[29] Arne, Barberis, Buckley (2017); Omarova (2020).
[30] Buchak, Matvos, Piskorski, and Seru (2018).
[31] European Parliament (2017).
[32] Claessens, Frost, Turner, and Zhu (2018).
[33] Jagtiani and Lemieux (2019).

The unbundling of services potentially enabled by technology may mean that one of the traditional tasks performed by banks, such as deposit taking, will be separated from the provision of other financial services[34]. This phenomenon is likely to invoke a great change in market supply and demand. Ultimately, as investigated in this chapter, it could result in a greater share of activity falling outside the regulatory prudential perimeter, along with a decrease in compliance costs.

1.1.2. Financial innovation and market structure

The development of FinTech innovation hinges on several drivers which play a key role in shaping the current market structure of the financial sector. For the purposes of this work, market structure is seen as the interrelation of firms in a market that impacts their profitability and behaviour. As is known, market structure is dependent on factors such as the size and number of participants, consumer transparency, accessibility of technologies and information to all participants, and exit and entry barriers[35]. In certain speculative scenarios, these may, in turn, have an impact on the stability of the financial system. This section provides an overview of the main elements that influence FinTech innovation by looking, firstly, at the supply side of the market and, secondly, at the demand side and the regulatory environment.

1.1.2.1 Supply side

The main driver of change on the supply side relates to the achievement of several technological developments[36], namely, the systematic use of application programming interfaces (APIs), enabling interoperability, smooth data sharing, cloud computing, as well as new patterns of consumer behaviour based on smartphone usage, which have significantly altered interactions between providers and users[37].

APIs are digital protocols that allow different software to communicate with each other through the direct exchange of data, without the need for human intervention[38]. They have been used for decades in the financial industry (for example, by enabling asset management companies' software to send bills automatically to online banking accounts)[39]. Arguably, over the last decade, APIs have become a widely used *de facto* standard for sharing data. As analysed in chapter 4, they are now acknowledged

[34] Financial Stability Board (2017), 12.
[35] Financial Stability Board (2017), 7-10.
[36] Financial Stability Board (2019).
[37] Borgogno and Colangelo (2019a).
[38] The key role of APIs regulation and standardisation is investigated in chapter 4.
[39] McKinsey & Company (2017).

by the industry and policy makers as the mechanism to enable financial institutions holding large amounts of data to act as platforms for third party innovation. The most recent development of this type of communication tool is so-called "open APIs", which facilitate service improvements and smooth payment operations via third party providers[40]. An increasing number of jurisdictions are developing new API-based frameworks for the FinTech market environment with a view to achieving even greater interoperability between providers and services.

The high pace of innovation in the field of information and communication technologies has turned mobile devices into a key element of consumers' daily commercial lives throughout the jurisdictions, significantly expanding the market for financial services as well as the expectations of consumers[41]. Smartphone operating systems can now act as platforms to allow third party developers to offer new products to consumers. As a result, smartphones are set to become a key "client interface" through which a vast array of services can be provided. For instance, due to the implementation of APIs on smartphones, consumers can now send payment orders from different bank accounts through a single application[42].

Lastly, cloud computing offers significant advantages in terms of flexibility, economies of scale, cost and operational effectiveness which allow incumbents and new entrants to compete on a more level playing field[43]. This new technology is at the very heart of outsourcing arrangements by which financial institutions can enjoy up-to-date services without devoting internal resources to research and development activities unrelated to their core business (for instance, to assess the functioning of APIs against key business indicators)[44].

1.1.2.2 Demand side

On the demand side, the digitalisation of retail commerce and real-time transacting capability of internet-connected devices have increased customer experience and expectation in relation to the speed, convenience, and user-friendliness of banking services. As new delivery systems are created,

[40] As shown by Mehrotra (2016), the programmable web, a public directory of web APIs, has seen the size of its records increase from one in 2005 to more than 17,000 twelve years later. As illustrated in Chapter 4, several jurisdictions have developed or are developing frameworks for the application of APIs.
[41] Marianne Crowe, Elisa Tavilla, and Breffini McGuire (2017); Financial Stability Board (2017), 6.
[42] For instance, single platforms in China integrate mobile phone wallet capability, online shopping, and activities including money transfer between different individuals. See chapter 3 for an in-depth analysis of payment initiation services providers under EU law.
[43] Cloud computing means the practice of relying on a network of remote servers, usually accessed over the internet, for the provision of information technology services (not just customer relationship management, financial accounting and human resources, but also credit scoring, consumer payments, statements and billing) to financial institutions.
[44] European Banking Authority (2017j).

such as automatic voice assistants, these expectations are likely to grow further[45]. At the same time, it must be acknowledged that customers are showing increasing acceptance of new technologies being used for online financial transactions in reaction to the current high pace of business innovation.

Moreover, demographic factors, such as the increasing digital literacy of Millennials and digital natives, have contributed to strengthening the demand for FinTech services[46]. It has been noted that these young cohorts have greater trust in new players on the online lending market[47]. As illustrated in the second part of this chapter, the development of non-banking financial intermediation would benefit significantly from the general perception among young groups of consumers that FinTech credit is more desirable and socially responsible than conventional banking[48].

Finally, it is worth noting that the adoption of FinTech innovation is not homogenous throughout the different jurisdictions. Convergence and economic development factors must be considered to justify the rapid adoption of digital technology in some developing nations and emerging markets. In the Asian large economies, for example, the growing supply of wealth, coupled with a desire for higher returns in the face of low yields on state bonds, has provided FinTech lending and payment platforms with a larger investor base[49]. In turn, this is driving higher investments from financial institutions and asset managers. As argued below in this chapter with reference to the FinTech empowered lending market, investors may consider FinTech loans as an appealing competitor of traditional commercial banks.

1.1.2.3 Regulatory side

Against this background, financial regulation went through a thorough reform process in the aftermath of the 2008 financial crisis, particularly in the US and the EU[50]. Overall, the business activity of traditional banks has been progressively characterised by an increased regulatory burden. Policy makers have made more stringent the compliance obligations of banks and have altered their commercial incentives and business structures. The paradigm of the universal banking model has been tackled with ring-fencing obligations and has increased regulatory capital requirements[51]. Moreover, as the intense use of collateralised debt obligations was considered one of the main triggers of financial contagion due to the detachment of the credit risk from the underlying loan originator,

[45] Some banks offer virtual assistance on Amazon's artificial intelligence powered voice interactive device (i.e. Alexa). For a critical view in this regard, see: Barrett (2019).
[46] Financial Stability Board (2017) 11.
[47] Ernst & Young (2019).
[48] Milne, Parboteeah (2016).
[49] Claessens, Frost, Turner, and Zhu (2018).
[50] Armour et al. (2016), 416-17.
[51] Armour et al. (2016), 409-15.

new rules have been enacted to curb the systemic risk generated by the biggest and most interconnected financial institutions[52]. On top of this, new resolution regimes were put into place both in the EU and in the US in order to ensure that the failure of the banks took place in an orderly fashion. Traditional financial institutions, such as commercial banks and investment companies, are now under an obligation to produce recovery and resolution plans and to carry out stress tests in order to ascertain their viability[53].

The combination of tightened regulations on the financial system in the aftermath of the 2008 crisis and the recent technological breakthroughs has led to the rise of FinTech non-banking financial intermediation. Traditional banks have been ordered to reduce risky lending, to invest in more liquid assets and to maintain higher regulatory capital. As a result, new FinTech players have grasped the opportunity to enter the financial markets by providing specific services that might compete with the legacy players while avoiding the transformation services of banks and thus escaping the stricter regulations on capital and liquidity requirements (i.e. Basel III framework)[54].

1.1.3 The perils posed by FinTech

Alongside the opportunities it provides, FinTech innovation also raises some concerns. While some potential risks are entirely new, others are the same, already created by the provision of financial services through traditional means but exacerbated by the digitalisation of transaction activities[55].

Firstly, changing patterns of competition in the banking industry as a result of the emergence of FinTech may hinder financial stability due to regulatory arbitrage, adverse selection and moral hazards[56]. Financial stability concerns raised by digital innovation need to be targeted holistically, encompassing both micro-prudential and macro-prudential regulation[57]. A sudden increase in competitive pressure can trigger instability as incumbents may take on excessive risks to attempt to outdo the newcomers[58]. Coordination problems affecting depositors and investors, in turn, would

[52] Johnson (2013).
[53] Armour (2015), 454.
[54] Buchak, Matvos, Piskorski, and Seru (2018).
[55] Expert Group on Regulatory Obstacles to Financial Innovation (2019), 10-11.
[56] See, for example, Financial Stability Board (2019b); Financial Stability Board (2017); Vives (2019a). However, see Pierri and Timmer (2020), suggesting that the use of technology in lending may enhance financial stability by producing more resilient loans. However, Claessens, Frost, Turner, and Zhu (2018), 38, provide evidence against the argument that regulatory arbitrage strengthens FinTech activity, arguing that more stringent banking regulation might deter FinTech credit activity.
[57] See Enriques, Romano, and Wetzer (2020), laying down a complete taxonomy of prudential regulation hinging on network theory.
[58] Vives (2019b).

expose the industry to panic runs. Furthermore, maturity mismatch in FinTech lending may break out as platforms start using their balance sheet for intermediation or engage in securitisation. Conversely, liquidity mismatch would only become an issue in the unlikely event that FinTech players start holding customers' money[59].

Moreover, the operational risk is set to increase in importance as information sharing, outsourcing, and big data analytics become more widespread[60]. Indeed, cybersecurity and data protection are taking centre stage as the most vulnerable parts of the financial system. On the regulatory side, legal perimeters and supervisory techniques might need to be adapted for as long as FinTech business methods fall outside the scope of current legislation[61]. Finally, any future attempt to gauge macro-financial risk arising from contagion channels, systemically important entities, excess volatility or procyclicality must take account of FinTech-enabled activities[62].

1.1.4 The entry of BigTechs

Financial technology includes not only incumbent banks or small start-ups aiming to enter the financial market, but also well-established technology firms with extensive customer networks, such as Google, Amazon, Facebook and Apple (so-called BigTechs). These firms are looking to take advantage of their platforms to provide financial services. Contrary to ordinary FinTechs, they can scale up very quickly by leveraging on network effects, brand recognition, state-of-the-art technology and large proprietary customer datasets[63]. In some jurisdictions, such as China and other emerging markets and developing economies in South East Asia, East Africa and Latin America, the expansion of BigTechs has been rapid[64]. Contrary to FinTechs, platform-based companies enjoying substantial market power in their core industries (e-commerce, social networks, smartphones and wearables, etc.) are set to raise more urgent issues for regulators and policy makers[65].

By harnessing their rich portfolios of financial resources and datasets, they could enter the financial markets very quickly, offering new products and services and combining different types of financial and non-financial products and services. In light of the disruption brought about in the past in other industries, it is likely that the banking sector could face serious competitive pressure from the BigTechs. Financial technology is increasing the dependency of financial institutions on third party

[59] Financial Stability Board (2017), 13-15.
[60] Buckley, Arner, Zetzsche, and Selga (2020).
[61] European Banking Authority (2019d), 31-33.
[62] Financial Stability Board (2017), 15.
[63] Financial Stability Board (2019a), 3-4.
[64] Bank for International Settlements (2019a).
[65] Expert Group on Regulatory Obstacles to Financial Innovation (2019), 79-80.

service providers for physical connectivity, cloud services and data provision[66]. By harnessing their role as gatekeepers of their own platforms, alongside their extensive proprietary consumer datasets, such firms enjoy a significant competitive advantage when entering the financial markets (which are heavily dependent on reliable customer information)[67]. These elements differentiate BigTechs from ordinary FinTech small firms, which face bigger barriers to entering the financial markets in terms of customer trust and access to a wide customer base.

The Chinese payment industry has experienced significant disruptions from Alipay and WeChat, respectively created by the technology giants Alibaba and Tencent. Admittedly, the Chinese government decided to prioritise FinTech innovation and growth in order to tackle the relative inefficiencies of the Chinese financial system[68]. FinTech development is greater in jurisdictions where accessing credit is more difficult and less advanced. For instance, payment platforms based on mobile or social networking networks have seen a surge in the number of users throughout several jurisdictions (such as Alipay in China).

The financial activities of BigTech firms initially started with payments, but are rapidly expanding into the provision of credit, insurance, savings and investment products[69]. By way of example, Amazon entered the lending market in 2012 and is now striking a deal with Goldman Sachs to offer small business loans to its US consumers. The Seattle-based tech-company is also partnering with the Instant payment network to enable US consumers to query Alexa devices about their bills, and it has recently launched in India the Amazon Pay unified payment interface for Android users, in partnership with Axis Bank, allowing customers to make payments directly from their bank accounts. Facebook is working on a digital currency (Libra) and is consolidating its payment products under a new brand (Facebook Pay). Furthermore, Facebook's WhatsApp messaging service, in partnership with Cielo - Brazil's largest credit and debit card operator - has rolled out a system across Brazil allowing users to send money to individuals or businesses within a chat[70].

[66] For a recent overview on the perils from such dependencies in light of the COVID-19 pandemic, see Office of the Comptroller of the Currency (2020), 13-14.
[67] Financial Stability Board (2019a), 3-4.
[68] Claessens, Frost, Turner, and Zhu (2018).
[69] Bank of International Settlements (2019b); Financial Stability Board (2019a); Frost, Gambacorta, Huang, Shin, Zbinden (2019).
[70] However, the Central Bank of Brazil suspended Facebook's WhatsApp payment service within ten days of its rollout and ordered Mastercard and Visa to stop payment and money transfer activities through the app - Banco Central do Brasil, (2020): the central bank motivated its decision by referring to competition issues, notably to "the maintenance of an adequate competitive environment, which ensures the operation of a payment system that is interoperable, fast, safe, transparent, open and inexpensive." The main concern apparently relates to the fact that the WhatsApp user database, coupled with Cielo's high market share in payments, could prove too high a barrier for any new competitors.

Furthermore, Apple has recently launched its credit card in collaboration with Goldman Sachs and has acquired the start-up Mobeewave, whose technology could transform iPhones into mobile payment terminals. Google is soon expected to offer digital cheque and savings accounts to Google Pay users in the US in partnership with several banks (Citygroup, Stanford Federal Credit Union, Bank Mobile, Coastal Community Bank, BBVA, BMO Harris, SEFCU, First Independence Bank) and is developing its own (physical and virtual) debit cards, co-branded with different bank partners, aimed at becoming the foundation of the Google Pay app. In a similar vein, the Samsung Money programme will offer a cash management account and a debit card, integrated with the existing Samsung Pay app. Finally, Uber has joined the club of tech companies looking to expand into the world of finance by announcing a new division (Uber Money), which includes a digital wallet and upgraded debit and credit cards.

Due to the potential impact on competitors and consumers, the entry of BigTechs raises systemic concerns[71]. Indeed, the presence of strong economies of scale, extreme indirect network effects, remarkable economies of scope due to the role of data as a critical input, and conglomerate effects, make the digital markets highly concentrated, prone to tipping and not easily contestable. This tendency towards concentration may increase 'too big to fail' risks if large online platforms enter into financial services, since an idiosyncratic shock hitting a BigTech can have repercussions for the entire system. Further, BigTech partnerships with incumbent banks may create new operational and financial links and dependencies[72].

Finally, the entry of BigTechs into financial services poses serious antitrust concerns[73]. By exploiting their established networks, the massive quantities of data generated by them, and their access to analytical tools and cutting-edge technologies to process customer and transaction data, large online companies are able to offer an extremely broad range of integrated and tailored services. Hence, BigTechs may implement anti-competitive strategies, leveraging their market power by bundling new services with traditional products, engaging in self-preferencing, or hindering access to their platforms[74].

[71] Buckley, Arner, Zetzsche, and Selga (2020); Financial Stability Board (2019a) 22-26; Vives (2019b).
[72] Financial Stability Board (2019a), 22-26.
[73] This topic will be investigated further in chapter 5.
[74] See Borgogno and Colangelo (2019a); Expert Group on Regulatory Obstacles to Financial Innovation (2019), 80; De la Mano and Padilla (2018); Vives (2019b).

1.2 FinTech shadow banking and data exploitation in lending

One area of FinTech that is set to witness strong competitive pressure, as well as attracting the attention of international financial organisations, is lending[75]. A wide range of new lending platforms, including peer-to-peer and marketplace lenders, have appeared in jurisdictions across the world[76]. Financial institutions and new FinTech players often have access to online methods of client interaction as well as new sources of data and data analysis methodologies (such as machine learning). Moreover, they often benefit from new business models which do not rely on the traditional method of commercial banking based on taking savings and granting credit. In theory, this can create competitive pressure for incumbents, and force them to streamline their own loan underwriting processes and to employ faster and more improved data analytics systems.

Although the competitive pressure on incumbent lenders in most established market segments currently seems to be limited, the rate of FinTech implementation is increasing at a rapid pace[77]. Against this background, the lending sector is likely to be strongly affected by the rise of FinTech and, more specifically, by the implementation of new platform-based business models and the use of big data analytics. Indeed, intense competition is likely to arise as a wide range of lending platforms enters the market, including marketplace lenders[78]. By harnessing big data analytics, machine learning algorithms, and alternative data sources, these new players are aiming to meet the unsatisfied demand for loans to individuals and small and medium enterprises (SMEs)[79]. Alternative data might indeed complement the credit risk analysis, delivering a more accurate picture of customers' economic conditions and creditworthiness. Recent findings have revealed that lending platforms are able to provide credit to low-risk borrowers who, due to inaccurate credit records, could not obtain a loan based on traditional information and standardised banking assessments (FICO scores)[80].

The lending markets are being reshaped by the use of data science which is allowing for the more comprehensive use of all available information, overcoming the hurdles faced by credit customers with limited credit history. At the same time, such forms of advanced data analytics must be implemented in full compliance with data protection laws[81]. Until now, investors and lending institutions have only been able to perform risk assessments in a few standardised ways based mainly

[75] Financial Stability Board (2017), Bank of International Settlements (2019b).
[76] Committee on the Global Financial System and the Financial Stability Board (2017).
[77] Claessens, Frost, Turner, and Zhu (2018).
[78] Claessens, Frost, Turner, and Zhu (2018).
[79] Jagtiani and Lemieux (2019).
[80] Jagtiani and Lemieux (2019).
[81] For an in-depth analysis of the growing use of alternative data and machine learning to assess consumer creditworthiness (so-called algorithmic credit scoring), with a focus on the likely threats to consumer privacy and autonomy in consumer credit markets, see Aggarwal (2020); Wiedemann (2018), Hurley, Adebayo (2017).

on credit history. It follows that higher interest rates were applied to many borrowers due to the lack of information on their profile; some were even turned away. Using artificial intelligence and financial technology, lenders are now able to run cross-analyses of information gathered from social media, platform marketplaces, digital footprints and traditional datasets in order to gauge the likelihood of default by individuals and firms. As a consequence, these new techniques have narrowed the unbanked audience and allowed already credible borrowers to obtain lower interest rates. At the same time, it must be acknowledged that the pervasive use of data analytics increases the risks of unfair discrimination based on gender, race and local biases[82]. Moreover, from the perspective of competition policy, it is worth highlighting that if firms were really able to engage in perfect price discrimination vis-à-vis consumers, this would transfer the whole transaction surplus in favour of service providers[83].

Another new FinTech market to emerge lately is peer-to-peer lending, hinged on platform business methods and data analytics. The latter promise to remove intermediaries from the traditional investor-borrower relationship and to allow individuals and firms to fund other potential borrowers without relying on traditional credit entities. Therefore, undertakings, as well as consumers, can take part on both sides of the platform depending on their financial needs. More specifically, FinTech players have so far been able to outdo the incumbents by recognising consumer willingness to pay for tailored services[84].

As individuals and firms can quickly provide all material information through an online interface, user satisfaction and efficiency rank extremely high. It should come as no surprise, then, that Quicken has managed to shorten substantially loan origination procedures compared to the banking incumbents[85]. Moreover, Rocket Mortgage loans are granted automatically based on data which are not processed at all by traditional lenders[86]. In doing so, the firm is able to price discriminate, according to refined risk profiles, between those borrowers who are charged the same by traditional lenders. Somewhat surprisingly, this competitive process does not result in lower prices, but in premiums charged for proving convenience to specific users[87]. In the same vein, empirical analysis

[82] Gillis and Spiess (2019).

[83] For an up-to-date critical overview of the implications of personalised pricing as a form of abusive conduct under competition law and potential regulatory remedies based on limits on data collection/user profiling, transparency requirements, rights to opt out, see Botta, Wiedemann (2019); Maggiolino (2017).

[84] As shown by Seru (2019), in the US, Lending Club and Quicken Loans established themselves as leaders in the digital lending and residential mortgage market by means of their automated product delivery systems (such as "Rocket Mortgage").

[85] Buchak, Matvos, Piskorski, and Seru (2018).

[86] Buchak, Matvos, Piskorski, and Seru (2018).

[87] Seru (2019).

has revealed that technological breakthroughs deployed by FinTech lenders might enable them to outperform competitors when it comes to shocks in demand[88]. Indeed, FinTech lenders react more flexibly to exogenous mortgage demand shocks than other lenders, thereby alleviating the capacity constraints associated with traditional mortgage lending. This suggests that the increasing role played by FinTech, at least in the US mortgage market, improves the efficiency of financial intermediation.

FinTech credit has been broadly defined by the Bank of International Settlements as including all credit activity facilitated by electronic (online) platforms that are not operated by commercial banks[89]. This definition of FinTech credit encompasses all credit activity facilitated by platforms that match borrowers with lenders (investors). A defining trait of FinTech credit firms is that they use digital technologies and innovations to interact systematically with consumers online and analyse large amounts of customer data. Conversely, traditional commercial banks, even those with online services, do not make such extensive use of digital footprints and usually rely on offline processes and infrastructures. Even more importantly, unlike FinTech credit platforms, commercial banks finance themselves through repayable deposits. As is widely known, this form of financing justifies the strict prudential regulations and supervision imposed on commercial banks, including substantial data reporting requirements. Up until now, FinTech credit service providers have performed their activity from outside the prudential regulatory (and reporting) perimeter applied to commercial banks. In light of this, FinTech credit is considered a potential future new pillar of the alternative credit market[90].

From an empirical perspective, identifying the actual size of FinTech credit is not an easy task, partly due to its diversity, small size and novelty[91]. Official national data are limited, as FinTech credit platforms are not subject to regulatory reporting requirements in most jurisdictions. Until now, the most comprehensive data have been collected by the Cambridge Centre for Alternative Finance (CCAF) and the Academy of Internet Finance (AIF) of Zhejiang University, together with academic or industry partners[92]. These data are compiled by surveying FinTech platforms and, where possible, supplemented by other information from public reporting and secondary sources (such as platform websites). Private sector data providers, such as industry bodies or firms producing FinTech credit analytics, also provide some statistics. These and other data provide a reasonable picture of the size and recent growth of FinTech credit markets across the various economies. However, there are several limitations. Those data are not complete due to the rapidly changing market dynamics. Moreover,

[88] Fuster, Plosser, Schnabl, and Vickery (2018).
[89] Claessens et al. (2018), 31.
[90] Cornelli, Frost, Gambacorta, Rau, Wardrop and Ziegler (2020).
[91] Claessens et al. (2018), 32.
[92] Academy of Internet Finance (AIF) of Zhejiang University and CCAF (2018).

they do not include all platform-based companies or players that can arguably be considered to be FinTech firms; as such, the real size of FinTech credit is likely to be underestimated.

FinTech has grown globally over the past five years, but there are significant differences in the various jurisdictions, with China at the forefront. China leads in terms of both alternative finance volumes and growth rates, followed by the US[93]. In China, the alternative finance market was worth almost $102 billion in 2015, having more than tripled in one year.

Note: The data covers all crowdfunding and lending activities tracked by the Cambridge Centre for Alternative Finance. Average growth is reported over the most recent available years, namely 2014 and 2015[94].

In the different European countries, the FinTech market currently remains very small. If the United Kingdom is excluded, the total volume of alternative finance in the EU was $1 billion in 2015 and compared to 2014 the growth rate was less than 100 percent (Cambridge Centre for Alternative Finance, 2016). Within Europe, France and Germany are the leading countries (Figure 4). Volumes are very low in central and eastern European countries and other countries, although they are growing rapidly[95].

[93] Cambridge Centre for Alternative Finance (2016).
[94] Demertzis, Merler, Wolf (2018).
[95] Bruegel (2017).

1.2.1 The challenge of FinTech-based shadow banking.

In recent decades, a driver of change in the financial system has been the rise of the "shadow banking system", often known as "market-based intermediation"[96]. As is known, the phenomenon has become more widespread in the United States[97], but a similar development has also come to the fore in the EU[98]. According to the FSB, "market-based intermediation" usually means "a system of intermediaries, instruments, entities or financial contracts generating a combination of bank-like functions but outside of the regulatory perimeter or under a regulatory regime which is either light or addresses issues other than systemic risks, and without guaranteed access to central bank liquidity facility or public sector credit guarantees"[99]. Throughout the world, non-banking financial intermediaries hold around $183.7 trillion in assets, equal to 48% of the total financial system assets in the surveyed jurisdictions (including pension funds, insurance companies and other financial intermediaries)[100].

In this context, shadow banking is viewed as a form of market-based finance and is often encouraged as it provides alternative sources of finance to the real economy and exerts competitive pressures on the banking sector[101]. Prior to the financial crisis, regulators generally believed that these developments had reduced the overall level of systemic risk. This is because the banking model entails a certain level of institutional fragility and, because of its ties to the payment system, represents a locus of systemic risk in the economy. Thus, it was reasoned, the substitution of credit provision by markets rather than banks would reduce the systemic risk[102].

It is now widely thought among scholars and regulators that this view was mistaken[103]. The shift in the financial system did not so much reduce systemic risk as change the sources from which it arose.

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[96] European Systemic Risk Board (20019), 8.

[97] According to Edwards and Mishkin (1995), in the US, the banks' share of total financial assets was below that of pension funds, insurers, and other financial intermediaries over the period 2004–14; the banks' percentage share ranged in the low 20s over the period. Financial Stability Board (2015), 59.

[98] Haan, Oosterloo, and Schoenmaker (2009), 181. In the UK, for example, the banks' share was consistently above that of insurers, pension funds, and other financial intermediaries throughout the period 2004–14; the banks' percentage share ranged mostly in the 50s.

[99] For a general overview, see Financial Stability Board (2020); European Parliament (2012).

[100] Financial Stability Board (2020).

[101] In addition to the regulatory efforts to encourage market-based finance, shadow banking owes its growth to market forces, financial innovation, and technological developments. For an overview, see Prüm (2014), 15-18.

[102] Systemic risk refers to the possibility that an event at company level could generate severe instability throughout an entire industry or collapse the economy. It is generally believed by scholars that systemic risk was a major contributor to the 2008 financial crisis. Firms considered to pose an excessive rate of systemic risk are known as "too big to fail" as Governments prefer to bail them out with taxpayers' money rather than allowing them to fail like any other ordinary company. See Armour, Gordon (2014), 64-74; Coffee (2011). For an up-to-date overview of the systemic risk of EU non-bank financial intermediation within the EU, see European Systemic Risk Board (2020).

[103] Armour, Awrey, Davies, Enriques, Gordon, Mayer, and Payne (2016), 434.

Rather than being triggered by banks subject to prudential supervision, systemic risk stemmed from non-banking financial intermediation which escaped prudential surveillance in many jurisdictions (such as the US). Therefore, a regulatory framework focusing its search for systemic risk on 'banks' was not suitable to target - and even less so to control - emergent varieties of that risk. More specifically, a regulatory framework that regarded disclosure as the principal strategy for controlling market-based risks did not quickly perceive the need for prudential monitoring of forms of market-based credit intermediation that performed bank-like liquidity and maturity transformation. As non-banking financial intermediation managed to avoid prudential supervision up until the financial crisis, scholars are now concerned that this problem may be exacerbated again due to the new developments triggered by FinTech[104].

The transition brought about by FinTech innovation in the structure of the financial system caused a substantial impact in terms of systemic risk in its cross-sectional structure. Up until the 2008 crisis, financial regulators continued to apply conceptual perspectives that did not take into account the migration of systemic risk from the banking sector to market-based intermediation, which has increasingly relied upon FinTech innovation.

In turn, as outlined by the Financial Stability Board and the European Systemic Risk Board, it is crucially important to monitor in a meaningful way the systemic risk generated by FinTech innovation from a macro-prudential perspective[105]. It should come as no surprise that if the new triggers of systemic risk are not targeted in time, this may generate a substantial threat to the integrity of the financial sector. Understanding how FinTech innovation is changing the structure of the financial system and to what extent it will shape the relationship between non-banking financial providers and incumbents should be a top priority for any regulatory strategy.

It is commonly recognised that the main benefit of a healthy and thriving non-banking financial sector is increased risk-sharing across the financial system and the flourishing of alternative sources of access to finance. Non-banking financial operators, depending on their business method, can perform liquidity and credit transformation as well as gather risky assets in their portfolio more cheaply than traditional banks. It follows that these players can increase the riskiness of their portfolios and thus leave themselves open to vulnerabilities that may prove to be dangerous from a systemic perspective.

[104] Buchak, Matvos, Piskorski, and Seru (2018); Financial Stability Board (2017). Chapter 2 evaluates how to establish a regulatory framework that is suitable for encouraging FinTech innovation while keeping micro and macro prudential risks under control.
[105] Financial Stability Board (2017), Bank of International Settlements (2019b).

The development of new systemic risks may be generated by macroeconomic trends in place in the global economy. More specifically, the low interest rate landscape of the last decade has incited investors and non-banking financial players to engage in riskier activities (e.g. greater exposure to riskier assets) in search for higher expected gains. As these non-banking financial players became more vulnerable to price shocks and changes in the risk profile of specific asset classes, between 2008 and 2017, the likelihood of negative externalities in other fields of the financial system or in the real economy triggered by potential failures of FinTech-based operators increased[106].

The main difference between the shadow banking systems of the EU and of the US lies in the structural differences in the financial markets of these two jurisdictions[107]. There are at least two significant contributing factors to the divergent paths of the evolution of shadow banking on each side of the ocean. The first concerns the fact that, broadly speaking, Europe has a bank-based financial market, while the US has a market-based financial system[108].

The second difference concerns the banking business model across the Atlantic and the different structure of the banking industry (i.e. universal banking vs. separation of commercial and investment banking)[109]. The universal banking model dominates Europe, while modern banking in the US, since the Great Depression and the enactment of the Glass-Steagall Act, has witnessed a separation of investment banking from commercial banking. If shadow banking is defined in terms of market-based financial intermediation, in a universal banking model there is broader scope for banks to engage in shadow banking activities[110]. Therefore, those jurisdictions in which universal banking is the dominant banking business model are expected to present higher levels of interconnectedness between banks and shadow banking entities. For example, in the universal banking model, since many financial activities can be performed under the umbrella of one entity, it is more likely that the banking

[106] European Systemic Risk Board (2019), 11.

[107] Admittedly, the US and EU market-based financial intermediation markets are formed by homogenous players and entities. In fact, insofar as the European Internal Market is concerned, there is a vast array of different approaches to dealing with non-banking financial institutions from jurisdiction to jurisdiction. For instance, the European Banking Authority (2017a), European Banking Authority (2017b) and European Systemic Risk Board (2019) indicate the existence of an unlevel playing field in the regulatory and prudential treatment of non-banking financial institutions across the EU Internal Market. It follows that any transatlantic comparison on shadow banking should consider this complexity. As suggested by Nabilou and Prüm (2019), such a situation also strongly argues against a similar regulatory approach towards non-banking financial institutions in the US and in the EU.

[108] Levine (2002); European Commission (2015b), 18-25.

[109] Nabilou and Prüm (2019); Borgogno (2017).

[110] According to the Financial Stability Board (2011), the market-based financial intermediation system involves institutions and activities outside the perimeter of the traditional commercial banking system.

industry will engage in shadow banking operations by sponsoring MMFs, offering prime brokerage services, or undertaking broker-dealer functions in the financial system[111].

Nevertheless, the credit crunch that followed the 2007-2008 financial crisis and the tightening of banking regulation have pushed European policymakers to promote market finance and to reduce the real economy's reliance on the banking sector. Accordingly, in 2015 the Commission launched the Action Plan on building a Capital Market Union to mobilise capital in Europe and to channel it to all companies, including SMEs, infrastructures and long-term sustainable projects[112]. The need to establish the Capital Market Union hinged on the chronic lack of capital market funding affecting the Internal Market. Indeed, the European Commission found that, compared with the US, European small and medium firms received five times less funding from the capital markets. This amounts to almost Euro 90 billion of funds that could have been channelled to the real economy in a five-year period. In response to the capital contraction that characterised the European banking sector aimed at reducing exposure to risk and leverage in the aftermath of the financial crisis, the capital markets are regarded by European policy makers as a powerful solution for funding businesses and households[113].

In particular, the European Commission targets FinTech as a key driver of capital market transformation able to bring about more efficient solutions, to attract new market players, to increase competition and to reduce entry barriers[114]. The regulatory mechanisms enshrined in the PSD2 have been praised as a blueprint for taking a balanced approach, allowing FinTech providers to develop new business models and to identify new issues that may need to be integrated into the CMU policy framework[115]. Finally, the European Commission acknowledged that innovative firms might be subject to disproportionate or inconsistent practices in applying regulatory requirements. Consequently, the Commission launched a public consultation in 2017 to assess whether more proportionate licensing arrangements for FinTech activities were needed. Notably, from the 226 responses received by the Commission, it emerged that regulatory instruments allowing for financial

[111] Pozsar (2014) provides a convincing argument for distinguishing the cases in which dealers can be considered part of the shadow banking system.

[112] See European Commission (2015c).

[113] European Commission (2017g), 4.

[114] The Commission referred explicitly to financial innovations which can make the EU capital markets broader and deeper, including crowdfunding and other alternative funding tools; supply chain finance; robo-advice; online shareholder voting; and the possible application of blockchain technology in post-trading. FinTech can offer solutions in several capital market segments and functions, such as equity issuance; corporate governance; asset management; investment intermediation; product distribution; and post-trade market infrastructure, including securities custody services. See European Commission (2017g), 12-13.

[115] European Commission (2017g), 8.

data sharing, such as the ones enacted in the PSD2 and the GDPR, will be instrumental in designing more ambitious and efficient lending solutions[116].

1.2.2 The European scenario in the face of FinTech enabled credit intermediation

So far, the response of the EU to problems in the shadow banking sector follows the Financial Stability Board's approach by focusing on "entities", such as money market funds or financial intermediaries, and "activities" or instruments, such as securities financing transactions (SFTs). In 2012, the European Commission (EC) published a Green Paper on shadow banking to gather input on how to address credit intermediation risks outside the formal banking system[117]. Thereafter, the regulation of shadow banking at EU level was put on the regulatory agenda of the EC in a communication setting out the policy objectives and timeline for shadow banking regulatory reform proposals[118].

Non-banking sources of finance in Europe have grown significantly since the 2008 global financial crisis. Conversely, traditional bank lending has plummeted, only showing signs of recovery in the last three years[119]. In this context, the shadow banking sector has become a key source of funding for individuals and companies. Empirical findings have revealed that listed shares issued by non-financial corporations and debt securities are held for the most part by non-banking financial players and only residually by banks. Such diversification regarding access to finance should be welcomed as it allows for the credit risk to be distributed evenly across the Internal Market. At the same time, this type of evolution requires regulators to monitor closely the rise of new systemic vulnerabilities in order to tackle them before they materialise.

[116] European Commission (2017c). For an overview on financial data sharing under the PSD2, see Borgogno and Colangelo (2020).

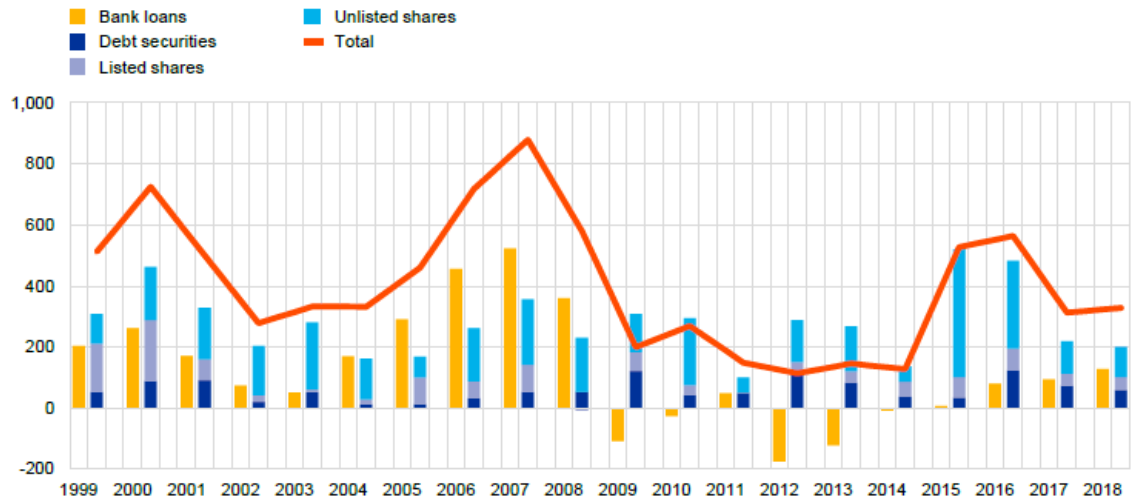
[117] European Commission (2013a). The communication on shadow banking is the second prong of the EU package. It basically gives an overview of all existing measures and additional measures that can be considered to regulate shadow banking activities. See European Commission (2013b).

[118] European Commission (2014d), 116.

[119] European Systemic Risk Board (2019), 6.

Net finance raised by euro area non-financial corporations

(EUR billions)



Sources: ECB Quarterly Sector Accounts (QSA) and ESRB calculations.
Notes: See Section 4.2. Bank loans include loans granted by banks and other monetary financial institutions (MFIs) to NFCs.

1.2.3 Non-banking lending activity in the EU

Supervision and financial regulation have historically focused on traditional banks. The underlying belief of a "bank-centred" approach to financial regulation is that banks are the most suitable intermediaries to carry out maturity transformation (i.e. taking short-term deposits to fund long-term loans) as they are subject to a robust regulatory framework aimed, among other things, at avoiding depositor bankruptcies and systemic crises. According to this view, therefore, a sound and stable banking system is crucial for ensuring the smooth channelling of resources to the economy.

Over the last decade, as shown in the previous section, banks have witnessed a slow but steady disintermediation of their role in the lending market caused by the entry and growth of FinTech non-banking financial intermediaries. Most of these entities do not fund their activity through deposits and, from a theoretical perspective, they should not be subject to traditional bank regulation. Furthermore, they make greater reliance upon technology and data analytics being central to their business model than their counterparts in traditional financial intermediation[120]. Moreover, as they compete with banks on price and non-price dimensions (service quality, tailored products, customer experience, etc.) in some markets and not in others, it is critical to understand their business model to gain a better appreciation of their functions and fragilities.

[120] See Bank of International Settlements (2019b), Chapter III.

FinTech non-banking financial intermediation is part of a broader evolution towards a more market-based financial system. Unlike the tradition banking system, it represents a different way of generating, distributing and investing money, risk and credit globally[121].

The growth of FinTech market-based finance (or shadow banking or non-banking financial intermediation) has been fuelled not only by recent technological breakthroughs, but also by the heavy regulatory burden placed on banks in the last decade. Financial regulation underwent a thorough reform process in the aftermath of the 2008 financial crisis, particularly in the US and EU[122]. Overall, the business activity of traditional banks has been progressively characterised by a reinforced regulatory burden. Policy makers increased the compliance obligations of banks and altered their commercial incentives and business structures. The paradigm of the universal banking model has been tackled with ring-fencing obligations and increased regulatory capital requirements. Moreover, as the intense use of collateralised debt obligations (CDOs) was considered one of the main triggers of financial contagion due to the detachment of credit risk from the underlying loan originator, new rules were enacted to curb the systemic risk generated by the biggest and most interconnected financial institutions[123]. On top of this, new resolution regimes were put into place in both the EU and the US in order to ensure that the failure of the banks took place in an orderly fashion: traditional financial institutions are now obliged to establish Recovery and Resolution Plans (RRPs) and conduct stress tests to evaluate their viability[124].

Such observations are based upon empirical evidence showing that banks are more likely to retreat from mortgage lending in regions where supervisory and regulatory pressure on incumbents is higher[125]. Admittedly, it is likely that financial intermediation in principle would have flourished even if traditional banking had been unregulated. It follows that regulatory arbitrage alone cannot be seen as the trigger of FinTech non-banking financial intermediation; technological innovation also played a crucial role in this transition[126].

[121] Financial Conduct Authority (2016).
[122] For an overview of the regulatory environment which nurtures FinTech innovation, see Section 1.2.3.
[123] Wetzer (2019).
[124] Armour, Awrey, Davies, Enriques, Gordon, Mayer, and Payne (2016).
[125] Buchak, Matvos, Piskorski, and Seru (2018), 453-483. The authors have found that shadow banks increased their market share during the period 2008-2016 across regions characterised by regulatory and supervisory pressure on bank mortgage lending. In the same vein, Irani, Iyer, Meisenzahl, Peydro (2018) demonstrate that increased regulatory pressure on banks leads to an increase in shadow banking. Similarly, see Hachem (2018), 287-308, with reference to wealth management products.
[126] Financial Conduct Authority (2016).

In light of the above scenario and of the interplay between banks and FinTech non-banking financial intermediaries, any policy intervention addressed to the supply of credit requires policy makers to assess the changing role of banks and the significance of these new players on the market.

1.2.3.1 Notion of credit institution and other financial intermediaries in EU law

Considering the changing credit market conditions due to the growth of the shadow banking system and FinTech development, this section offers an overview of the EU legal framework on the provision of credit. This may help to clarify the distinction between traditional banking (performed by "credit institutions", according to EU law) and market-based credit intermediation for the analysis carried out in the subsequent part of the thesis. More specifically, following a broad-level analysis of the growing FinTech shadow banking system as well as an in-depth analysis of the European rules on non-banking lenders, the section lays the foundations for the comparative analysis which will be carried out at the end of the chapter.

Among the many activities traditionally performed by banks, collecting deposits from the public is one that is of the utmost importance for society. Pursuant to Article 4(1) of Regulation (EU) no. 575/2013 on prudential requirements for credit institutions and investment firms (so-called CRR), a credit institution is defined as any undertaking "the business of which is to take deposits or other repayable funds from the public and to grant credits for its own account"[127]. It is worth pointing out that such an authorisation requirement has been well-established within EU law since the first Directive 77/780/EEC on the coordination of the laws, regulations and administrative provisions relating to the taking up and pursuit of the business of credit institutions.

According to Recital 5 of this piece of legislation, banking business, from the capital raising side, consists of receiving "repayable funds from the public whether in the form of deposits or in other forms such as the continuing issue of bonds and other comparable securities". In the same vein, Article 1 completes this by adding that credit institution "means an undertaking whose business is to receive deposits or other repayable funds from the public and to grant credits for its own account". The same legal framework remained unaltered in Article 9(1) of Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment

[127] Regulation (EU) No 575/2013 on prudential requirements for credit institutions and investment firms, OJ L 176/1.

firms (so-called CRD IV)[128]. The provision forbids persons or undertakings other than credit institutions from carrying out the business of taking deposits or other repayable funds from the public.

As noted by the European Banking Authority (EBA) in 2014, the key concepts that make up the definition of a "credit institution" ("grant credits", "deposits", "and other repayable funds", "from the public") under Article 4(1) of Regulation (EU) no. 575/2013 are not defined by the regulation. Such a definition is particularly important in the realm of financial regulation in order to target the undertakings subject to authorisation and prudential requirements under the Bank Recovery and Resolution Directive[129], the players within the scope of the Deposit Guarantee Schemes Directive[130], the Single Resolution Mechanism[131] and the Single Supervision Mechanism[132]. It follows that the overall regulatory perimeter is indeed crucial for establishing whether a financial institution must face substantial regulatory costs in order to access the lending market.

1.3 An overview of the EU regulatory framework on FinTech

The above discussion on the market context of FinTech should also be put in the perspective of the legal framework to which the attention now turns. These findings will show that here is no specific definition of lending in the European banking and financial legislation. According to Annex I of the CRD IV, lending is an activity of manifold meanings that could include, *inter alia*, consumer credit, credit agreements relating to immovable property, factoring, with or without recourse, financing of commercial transactions (including forfeiting)[133]. At its very heart, lending is understood to encompass all activities aimed at providing the recipient with a patrimonial addition in exchange for an obligation to pay back a monetary sum in the future. Accordingly, this broad definition allows the provision of risk capital (such as equity or equity-like financial instruments) to be excluded from

[128] Article 9(2) of Directive (EU) 2013/36 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms reads as follows: "Member States shall prohibit persons or undertakings that are not credit institutions from carrying out the business of taking deposits or other repayable funds from the public".

[129] Directive (EU) No 2014/59 establishing a framework for the recovery and resolution of credit institutions and investment firms [2014] OJ L 173/190.

[130] Directive (EU) 2014/49 on deposit guarantee schemes. Text with EEA relevance, OJ L 173/149 (2014).

[131] Regulation (EU) No 806/2014 establishing uniform rules and a uniform procedure for the resolution of credit institutions and certain investment firms in the framework of a Single Resolution Mechanism and a Single Resolution Fund [2014] OJ L 225/1

[132] Council Regulation (EU) No 1024/2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions [2013] OJ L 287/63.

[133] Directive (EU) 2013/36 of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC Text with EEA relevance [2013] OJ L 176.

banking activity. Indeed, this kind of activity does not imply any legal obligation on the side of the investee to return a fixed amount of money at a certain time.

Despite not having an explicit definition, lending is nevertheless subject to a specific regulatory framework at EU level, either in the form of credit granting by a credit institution or when the borrower falls into a category that is deemed by policy makers worthy of additional protection in order to counter specific market failures (such as information asymmetry and adverse selection problems).

In terms of lending by credit institutions, the EU legislator has inextricably linked this activity to the collection of deposits or other repayable funds. Pursuant to Article 4(1) of Regulation (EU) No 575/2013 on prudential requirements for credit institutions and investment firms (so-called CRR), a credit institution is defined as any undertaking "the business of which is to take deposits or other repayable funds from the public and to grant credits for its own account"[134]. As noted by the European Banking Authority (EBA) in 2014, the key concepts that make up this definition of a "credit institution" ("grant credits", "deposits", "and other repayable funds", "from the public") under Article 4(1) of Regulation (EU) No 575/2013 are not defined by the regulation[135].

As the vast majority of EU Member States do not provide any clear-cut guidance within their domestic legislations for the definition of the words "granting credit for its own account", the European Banking Authority has suggested an interpretative approach for the sake of legal certainty[136]. This builds on the acknowledgement that throughout the Member States this concept is interpreted in broad terms as "the granting of any credit [by a professional specifically engaging in this business] to another person"[137]. In particular, the interpretation should hinge around three main considerations. Firstly, the inherent general scope of the concept "granting of credit" covering any agreements under which a sum of money is provided for an agreed period of time and is to be repaid according to predetermined conditions (e.g. payment of interest). Secondly, the interpretation should follow an illustrative list of examples and real-world contracts (such as commercial credit, bank account overdrafts, mortgage credit, purchase credit, financial leasing, consumer credit, pledges, guarantees, endorsements, credit lines and factoring, secured and unsecured credits and loans, credit card

[134] Regulation (EU) No 575/2013 on prudential requirements for credit institutions and investment firms [2013] OJ L 176/1.
[135] Such a definition is particularly important in the realm of financial regulation in order to target the undertakings subject to authorisation and prudential requirements under the Bank Recovery and Resolution Directive, the players within the scope of the Deposit Guarantee Schemes Directive, the Single Resolution Mechanism and the Single Supervision Mechanism. It follows that the overall regulatory perimeter is indeed crucial for establishing whether a financial institution must face substantial regulatory costs in order to access the lending market.
[136] European Banking Authority (2014b), 11.
[137] European Banking Authority (2014b), 10.

receivables). Thirdly, the final prong "on its own account" must be considered to mean that the credit institution is the actual creditor of the transaction.

Outside of the regulatory framework that applies to credit institutions, European law does not subject loan origination to specific authorisation or to a particular regulatory regime except for certain types of credit transactions (i.e. consumer credit agreements or those relating to residential immovable property) where the borrower falls into the definition of "consumer" pursuant to Article 3(a) of the so-called Consumer Credit Directive ("consumer means a natural person who, in transactions covered by this Directive, is acting for purposes which are outside his trade, business or profession")[138]. Importantly, however, these two pieces of legislation are centred around the protection of credit recipients (i.e. consumers) and do not establish any supervisory or authorisation regime for the entities on the loan origination side. Therefore, according to the both the CCD and the MCD, a "creditor" is seen to be any legal or natural person granting or promising to grant credit by way of business.

Both Directives were introduced with the clear goal of harmonising consumer protection standards throughout the Internal Market, regardless of national regulations on loan origination. It should come as no surprise, then, that the Member States are given free rein to limit autonomously credit intermediation activities as well as the status of creditor (for instance, by restricting it to certain kinds of legal entities)[139]. Indeed, it is worth noting that, under European law, Member States enjoy the freedom to establish any sort of prudential regulation or authorisation regime they see fit with reference to loan origination.

It follows that lender protection considerations have traditionally taken centre stage among policy makers. Contrary to deposits, originating from consumers and often subject to state guarantee schemes, credit origination is not regarded as prone to market failures. Indeed, the creditor is incentivised to engage in efficient lending and is expected to have the skills required to perform such activity in order to remain in the market. Thus, while banks face prudential requirements with reference to their credit exposure in order to safeguard depositor money as well as State resources,

[138] Directive (EC) 2008/48 of the European Parliament and of the Council of 23 April 2008 on credit agreements for consumers and repealing Council Directive 87/102/EEC [2008] OJ L 133. In the same vein, Article 4(1) of Directive (EU) 2014/17 of the European Parliament and of the Council of 4 February 2014 on credit agreements for consumers relating to residential immovable property and amending Directives 2008/48/EC and 2013/36/EU and Regulation (EU) No 1093/2010 Text with EEA relevance OJ L 60) explicitly refers to Article 3(a) of Directive (EC) 2008/48 (CCD).

[139] Recitals 10 and 15 of the CCD state, respectively, that "A Member State could thereby maintain or introduce national legislation corresponding to the provisions of this Directive or certain of its provisions on credit agreements outside the scope of this Directive" and "this Directive does not affect the right of Member States to limit, in conformity with Community law, the provision of credit for consumers to legal persons only or to certain legal persons". Moreover, Recital 10 of the MCD reads as follows: "this Directive should not affect the right of Member States to limit, in conformity with Union law, the role of creditor or credit intermediary under this Directive to legal persons only or to certain types of legal persons".

non-banking lenders are not necessarily subject to such a regulatory burden. Ultimately, the incentives underlying the business activity of these entities as well as their investors bearing the enterprise risk are closely aligned.

This explains why there is no European harmonised regime covering non-bank lending in the EU, not to mention the most advanced FinTech-enabled lending activities. Somewhat more surprisingly, Member States have adopted strikingly different approaches to the matter. In light of this divergence, in 2017 the European Banking Authority published an in-depth analysis of the prudential treatment of so-called "other financial intermediaries" (OFIs), i.e. those entities carrying out credit intermediation activities that are not credit institutions or other specified types of financial entity[140]. More specifically, OFIs have been seen as legal entities established in the EU, carrying out one or more credit intermediation activities and that are not subject to entity-specific (i.e. individual) prudential requirements under specific EU sector-based legislation.

From the responses provided by the national authorities, the EBA found that the prudential treatment of the non-bank lending sector across the EU varies significantly. Furthermore, the EBA stressed the need to update the list of activities subject to mutual recognition in Annex I to the CRD as it appears outdated in the face of recent market developments. In the accompanying Opinion[141] to its Report, the EBA pointed out that: (i) a wide range of OFIs perform credit intermediation activities outside an individual prudential framework specified in EU law (such as factoring companies, leasing companies, consumer/retail/microcredit and guarantee providers; securitisation vehicles; some crowdfunding entities; credit unions and other mutuals) and (ii) the prudential treatment of the OFIs varies significantly between the Member States, with some Member States applying CRDIV/CRR-like requirements to some or all OFIs in their jurisdictions, while some apply bespoke requirements and others apply no prudential requirements.

1.4 Adjusting the regulatory perimeter in the face of FinTech market intermediation

Whenever a firm wishes to enter the financial markets with innovative business methods and provision mechanisms, the regulatory perimeter actually in place within a jurisdiction plays a crucial

[140] European Banking Authority (2017e).
[141] European Banking Authority (2017e), 4 and 7-8.

role. In particular, it is worth looking at how the CRD IV, the EMD2[142], the PSD2[143] and the MCD[144] establish the regulatory status and authorisation approaches for new entrants. In this respect, the Commission, through the ambitious FinTech Action Plan, entrusted to the EBA the task of "monitoring the regulatory perimeter, including assessing current authorisation and licensing approaches to FinTech firms"[145].

A thorough analysis carried out by the EBA between 2017 and 2019 found that numerous FinTech activities are not subject to regulatory frameworks under EU or Member State law[146]. These include crypto-assets, technological service providers, technological support, reg-tech (firms using AI to extract content from financial documents, big data analysis, platforms using machine learning to prevent fraud, firms using artificial intelligence for credit risk analysis), platform-enabled services (crowdfunding, peer-to-peer lending), marketplace service providers (two-sided platforms connecting borrowers and lenders, businesses and potential customers), intermediation services, comparison services, and credit reference services. Admittedly, as all these activities are ancillary in nature to financial services, they are outside the scope of the regulatory perimeter[147]. For instance, they can be limited to the provision of technical support, IT solutions, and automated compliance. In the same vein, big data analytics services, broadly speaking, do not fall under financial regulation. Unlike those activities, crowdfunding has been considered by EU policymakers as a fully-fledged financial service rather than a non-financial FinTech activity[148].

As highlighted by the EBA, over the last five years several European national competent authorities have engaged in a sort of non-regular monitoring of new FinTech-enabled business methods and service providers. This may take the form of innovation hubs, target surveys or sector specific investigations. Moreover, as at January 2019, 21 EU Member States and 3 European Economic Area countries have set up innovation hubs or regulatory sandboxes and many others are due to be established. At their very essence, such regulatory experiments are intended to help regulators and

[142] Directive (EC) 2009/110 on the taking up, pursuit and prudential supervision of the business of electronic money institutions [2009] OJ L 267/10.
[143] Directive (EU) 2015/2366 on payment services in the internal market [2015] OJ L 337/35.
[144] Directive (EU) 2014/17 on credit agreements for consumers relating to residential immovable property [2014] OJ L 60/34.
[145] European Banking Authority (2018a).
[146] European Banking Authority (2019d), 13-14.
[147] European Banking Authority (2019d), 16.
[148] European Commission (2018l): this regulatory intervention is expected to address the major drawbacks of regulatory arbitrage within the Internal Market. Furthermore, the EBA has stressed that peer-to-peer lending and crowdfunding are regulated homogeneously also with regard to consumer protection and anti-money laundering (AML) rules.

businesses to target and monitor the viability of new business methods either from a social welfare perspective or from an industrial angle without ordinary legal risks.

1.4.1 Application of the principle of proportionality and flexibility to FinTech business models

Against this background, it is worth considering the continuing suitability of the current regulatory framework to cope with FinTech innovative business models, questioning whether the old-fashioned principle of proportionality enshrined in PSD2, CRD IV and EMD2 is still fit for purpose when it comes to authorisations for FinTech service providers. In order to provide an initial response, the EBA carried out an in-depth analysis of this issue, focusing on both the transparency and the predictability of the authorisation process and on the application of the principle of proportionality[149].

In relation to the authorisation process involving credit institutions, the EBA issued detailed guidelines and regulatory technical standards listing all the information to be provided under the CRD IV[150]. Furthermore, the ECB (for the European Banking Union) and the competent authorities of the UK, Poland, Czech Republic, Hungary and Croatia (for the non-Banking Union states) drafted additional guidelines on the authorisation process for credit institutions. Moving onto the guidelines established in the PSD2 and the EMD2, it is worth noting that the former lays down general harmonisation rules which are complemented and further developed in the EBA guidelines[151].

Interestingly, neither the CRD IV nor the PSD2 explicitly entrust the national competent authorities with the task of attaching limitations, conditions, or restrictions on the issuance of authorisations. However, in the CO *Societad de Gestión y Participatión v. DNB ruling*, the CJEU confirmed that national regulators can impose obligations or conditions as long as an approval could not be granted[152]. In light of this landmark case, the ECB took a strong stance by confirming its own competence, in its capacity as competent authority within the Banking Union, to impose conditions, limitations or obligations unless explicitly prohibited by national law[153]. Interestingly, such conditions are not based on the innovative nature of the applicant in question. They are designed as condition precedents (the authorisation is granted only once the requirements are met) and must be

[149] European Banking Authority (2019d).
[150] European Banking Authority (2019d), 19.
[151] European Banking Authority (2017c). These guidelines came into force on 13 January 2018 and were transposed by 19 national competent authorities in domestic guidance documents.
[152] CO Sociedad de Gestión y Participatión v. DNB and Others, Case C-18/14, EU:C:2015.
[153] European Central Bank (2019), par. 52-53.

proportionate[154]. Crucially, these conditions must not be used to overcome firms' inability to comply with the mandatory criteria laid down by EU law or national legislation.

Obligations may be applied in order to address on an ongoing basis concerns involving the business cycle of the applicant. For instance, a Euro 100,000 cap on deposit taking may be imposed, making the transfer or issuance of shares conditional upon the prior approval of the competent authority, with additional reporting requirements. In the event of a failure to comply with this obligation, the supervisory authorities may intervene promptly with enforcement measures. Unlike what happens within the Banking Union, in the UK conditional authorisations are not part of the regulatory toolbox. Overall, notwithstanding the fact that flexibility and proportionality are widely acknowledged by the European competent authorities, there is a material risk of such authorities developing divergent best practices. In the long run, this could give rise to regulatory competition between national jurisdictions and jeopardise the Internal Market. In light of these concerns, the EBA is in a position to tackle the problem with new specific guidelines setting forth common assessment methodologies, as mandated by Directive 2019/878 amending CRD IV[155].

The European competent authorities make use of the principle of proportionality throughout the authorisation processes for credit institutions regardless of the innovative nature of the business model involved. In particular, the assessment is carried out with particular attention to the intrinsic risk as well as the impact on the financial system at large based on the level of potential interconnectedness of the applicant. The analysis is performed on a case-by-case basis and focuses on several elements, such as the business plan, business model, financial soundness and ownership structure of the firm. For instance, as far as the Banking Union is concerned, the ECB gauges the assessment depending on the complexity and risk profile of the applicant due to the innovative character of the activity at issue[156]. Admittedly, as noted by the EBA, legal uncertainty is likely to increase when it comes to a FinTech applicant as it is problematic to forecast the level of sales and customers. In light of this risk, such applicants may be required to design exit plans in case of distress aimed at avoiding causing harm to users and stakeholders. Moreover, the EBA has pointed out that technology-related risks,

[154] For instance, the applicant could be required to provide additional capital, amend its bylaws or change its legal structure.

[155] Directive (EU) 2019/878 of the European Parliament and of the Council of 20 May 2019 amending Directive 2013/36/EU as regards exempted entities, financial holding companies, mixed financial holding companies, remuneration, supervisory measures and powers and capital conservation measures [2019] OJ L 150/253.

[156] Pursuant to Article 10 of the CRD IV, an in-depth description of the applicant's type of business must be provided in order for authorisation to be granted.

such as cybersecurity and data breaches, should be carefully considered when dealing with FinTech new entrants[157].

As the start-up phase of a FinTech firm is subject to a great deal of risk and uncertainty, the ECB requires applicants to hold a level of capital that is adequate to cover start-up losses. In this respect, CRD IV allows the competent authorities to grant credit authorisation to firms having less than Euro 5 million of capital. So far, eleven competent authorities within the Banking Union have invoked this option[158]. As far as FinTech firms are concerned, based on the EBA findings, only six applicants throughout the Internal Market received such authorisation over the last five years[159]. This normative option could give rise to dangerous inconsistencies within the Internal Market with reference to market access by FinTech credit institutions. It should come as no surprise that, as already happens in the realm of electronic money institutions under Directive 2009/110, strong regulatory competition may arise, through proactive interventions by national jurisdictions to attract firms and FinTech providers by way of regulatory weakening[160].

Article 13 of CRD IV requires that at least two persons effectively have the power to direct the business of the applicant credit institution. Notably, from a theoretical point of view, no distinction is admissible between innovative and traditional business methods. However, for FinTech applicants, the assessment shall not be limited to financial knowledge, but should also cover the computational and data analytics skills required to implement the business plan.

Furthermore, the principle of proportionality is enshrined in the PSD2, as further developed by the EBA in the Guidelines on authorisation and registration[161]. Namely, pursuant to Article 11(4) PSD2, procedures and governance mechanisms must be proportionate to the scale, complexity and nature of the payment services provided. In this regard, the competent authorities can calibrate their action depending on the risk profile, size, nature, scale and interconnectedness of the applicant (such as the skills of human resources, outsourcing providers, agents, foreign branches). It is worth noting that, according to the EBA, this principle only allows for the light touch application of mandatory requirements, but does not enable exemptions from them.

[157] European Banking Authority (2018b).

[158] Capital Requirement Directive IV, Article 12(4).

[159] According to the European Banking Authority (2017b), 24, they are Cyprus, Czech Republic, Estonia, Croatia, Hungary, Ireland, Lithuania, Portugal, Sweden, Slovenia and the United Kingdom.

[160] Enriques (2019); Awrey and van Zwieten (2018).

[161] European Banking Authority (2017d), par. 18: "the information provided by applicants should be true, complete, accurate and up to date, and the level of detail should be proportionate and adjusted to the particular service or services that the applicant intends to provide, namely their nature, scope, complexity and riskiness, and to the institution's size and internal organisation".

On top of this, the Member States are permitted, by PSD2, to establish specific exemptions from the application of the authorisation procedure requirements, provided that they fulfil the criteria laid down in Article 32 of the PSD2[162]. Notably, any exemption granted to payment service providers is conditional upon the fact that they are registered payment institutions and do not provide cross-border services. In the same vein, under Article 33 of PSD2, account information service providers can benefit from exemptions as long as they provide only account information services. Finally, as for capital requirements, Article 7 of PSD2 provides for the implementation of different capital requirements depending on the service provided. In real life cases, the competent authorities apply the principle of proportionality and flexibility concerning internal control mechanisms and the organisational structure, compliance function, shareholders assessments, viability of the business plan, outsourcing and anti-money laundering[163].

Credit provision is likely to be seriously affected by FinTech innovation depending on the regulatory approach applied by policy makers. European law does not subject lending services to a specific authorisation regime, provided that it is not coupled with deposit taking. Furthermore, at European level, the regulation of such activity has not been thoroughly harmonised, merely focusing on consumer protection. Conversely, lender protection has not attracted the attention of the legislator. This approach is indeed apparent in the Consumer Credit Directive (CCD) and in the Consumer Mortgage Directive (MCD)[164].

1.5 A comparative overview of FinTech non-bank lending in Europe

The EU Member States have tackled non-bank lending differently, choosing from a spectrum of different approaches. For instance, in the United Kingdom, the area has been left unregulated, while in Germany and France market-based lending has been subjected to an authorisation regime, having been equated to traditional banking activity. It follows that, in these jurisdictions, marketplace lending platforms must carry out their activity through traditional banks[165]. For instance, banking reserved

[162] Revised Payment Service Directive, Article 32(1) reads as follows: "(a) the monthly average of the preceding 12 months' total value of payment transactions executed by the person concerned, including any agent for which it assumes full responsibility, does not exceed a limit set by the Member State but that, in any event, amounts to no more than EUR 3 million; and (b) none of the natural persons responsible for the management or operation of the business has been convicted of offences relating to money laundering or terrorist financing or other financial crimes".

[163] European Banking Authority (2019d), 27-28.

[164] Directive (EC) 2008/48 on credit agreements for consumers and repealing Council Directive 87/102/EEC [2008] OJ L 133/66; Directive (EU) on credit agreements for consumers relating to residential immovable property and amending Directives 2008/48/EC and 2013/36/EU and Regulation (EU) 1093/2010 Text with EEA relevance [2010] OJ L 60/34.

[165] France recently changed this approach by adopting a sector-specific marketplace lending regulation.

activities traditionally include not only deposit taking, but also lending. Conversely, in Italy, a special regime was established to target the issue, as will be explained in the next part.

This section performs a comparative analysis of the regulatory approaches adopted by the different European jurisdictions towards non-bank financial intermediation. Finally, the Italian scenario will be investigated in more detail as it represents an attempt to extend banking regulation to market-based intermediation and is likely to have a significant influence on the implementation of FinTech within the industry.

1.5.1 France

Under French law, the regime of reserved activities had traditionally covered not only deposit taking (coupled with loan origination or as a stand-alone business), but also credit granting and the provision of payment services[166]. Notably, on the basis of this old legal framework, online lending platforms (particularly those implementing peer-to-peer business models) were deemed unlawful as the players involved (either natural or legal persons) were not authorised banks and were still operating for profit (by charging interest rates) or not exclusively within inner circles of friends and relatives[167]. Having said that, it is worth noting that the French courts did not apply the law strictly, as the established case law excluded the circumstance where money taking for a specific use could be in breach of the reserve of deposit taking[168]. As time passed, the regime of banking reserved activity progressively narrowed by way of new exceptions. New special reserved activities have been established for specific kinds of market players (such as crowdfunding platforms, insurance companies, financial institutions, European long-term investment funds, etc.)[169]. Against this backdrop, the major reform that changed the legal framework of market-based financial intermediation in France was Ordinance no. 2014-559 dated 30 May 2014 on "financement participatif" together with the implementing decree no. 2014-1053 dated 16 September 2014 amending the Code Monétaire et Financier.

Under the current legal framework, Article L313-1 of the Code Monétaire et Financier (i.e. the French Monetary and Financial Code) clarifies that 'credit transaction' is defined as any act whereby a person acting in return for payment (e.g. interest, fees) makes, or promises to make, funds available to another person, or gives an undertaking in favour of another person by signing a security bond or

[166] Articles L.511-5 and L.311-1 in the old version of the Code Monétaire et Financier. See also:
[167] De Vauplane (2013) 21; Lasserre Capdeville (2015) 4.
[168] Paris Court of Appeal, 25 February 1999, SC 455, Synvet; Muller, A.C. (2015), *Le financement participatif sous forme de prêt au regard du monopole et démarchage bancaires*, in Le Fur (2015), p. 199.
[169] Delmas-Marsalet (2016); Pesneau (2016) 14.

other guarantee[170]. Moreover, leasing, and, in general, all rental transactions with an option to purchase are treated as credit transactions. Thus, "credit transaction" is an umbrella concept that covers a vast array of financial contracts.

Against this backdrop, Article L511-5 of the Code Monétaire et Financier states that only credit institutions and finance companies ("société de financement") enjoy the right to engage in such a form of loan origination in their normal course of business and on their own account[171]. Société de financement were first established in 2013 as entities that can only perform credit transactions. It was reported that in 2018 the overall number of finance companies operating in France decreased by 6 units, moving from 181 in 2017 to 175 at the end of 2018[172].

Over the years, the French bank monopoly regime has been subject to a large number of exceptions, ranging from subscriptions and issuance of bonds, vendor loans, deferred payment terms, intra-group loans (meaning credit transactions between legal entities under unified control) and small shareholder loans. Moreover, firms that are not credit institutions or finance companies can engage in activities resembling credit transactions, such as payment service providers, crowdfunding platforms, insurance companies and long-term investment funds or specific kinds of alternative investment funds[173].

More specifically, Article L511-6 provides some exemptions from the prohibition referred to in Article L511-5. These include companies governed by the French Insurance Code, reinsurance companies, approved bodies which are subject to the provisions of Book II of the French Mutuality Code, investment firms, payment institutions, bodies that collect the employers' contribution to building efforts for transactions that come under the French Building and Housing Code, undertakings for collective investment in transferable securities (organismes de placement collectif en valeurs mobilières, OPCVM) and collective real-estate investment schemes (organismes de placement collectif immobilier, OPCI), non-profit organisations which grant loans in the context of their activities and for social reasons, firms which grant advances against salaries and wages or loans of an exceptional nature to their employees for social reasons.

The 2015 Macron Law[174] extended the exemption to the bank monopoly so as to allow limited liability companies to grant two-year loans to small and medium-sized enterprises with which they conduct

[170] On the same note, see European Banking Authority (2014) 10
[171] The second part of Article L511-5 of the Code Monétaire et Financier duly reflects Article 9(1) of the CRD IV which prohibits persons or undertakings that are not credit institutions from carrying out the business of taking deposits or other repayable funds from the public.
[172] Autorité de contrôle prudential et de resolution (2018).
[173] See Sultan et al. (2019) 78.

[174] Law no. 2015-990 of 6 August 2015 pour la croissance, l'activité et l'égalité des chances économiques [for Growth, Activity and Equal Economic Opportunity] ("Macron law"), entered into force on 8 August 2015, Article 167.

business relationships. A subsequent implementing decree dated 22 April 2016 (OJ no. 0073 of 24 April 2016)[175] set out the various types of business relationships authorising such credit transactions. Therefore, the ban enshrined in Article L511-5 does not prevent any firm from granting its contracting parties deferred payment terms or advances in the normal course of its business dealings, entering into leases for dwellings that include an option to purchase, issuing payment instruments delivered in order to purchase a specific item of property or a service from itself or from firms linked to it under a commercial franchise agreement, or allocating cash to guarantee a financial instruments transaction or a securities lending transaction.

Further exemptions were introduced in October 2017 to ease cross-border business. Since January 2018 certain foreign institutions (having a corporate purpose encompassing that of French authorised institutions) can acquire non-matured loans originating from French regulated entities[176].

In order to carry out credit transactions, a firm must submit an application to act as a société de financement to the French Autorité de contrôle prudentiel et de resolution (the national authority in charge of prudential and resolution procedures in France - ACPR)[177]. To obtain the licence, a finance company must meet certain prudential requirements relating to its ability to maintain certain liquidity and solvency ratios and share capital. Notably, finance companies are obliged to comply with internal organisation and governance rules mandated for credit institutions (i.e. appointment of risk management, control and compliance officers). More specifically, pursuant to Article L511-10 et seq. the Authority is entrusted the task of checking that the applicant fulfils the following requirements:

1) suitability of the legal form for the proposed activity;
2) minimum paid-up capital;
3) programme of operations and technical and financial resources;
4) identity and status of capital contributors and, where applicable, their guarantors, and the size of their holding;
5) central administration located in the same national territory as the registered office;

[175] Ordonnance n° 2016-520 du 28 avril 2016 relative aux bons de caisse, https://www.legifrance.gouv.fr/eli/ordonnance/2016/4/28/FCPT1608300R/jo (accessed on 1 April 2020).
[176] Ordonnance n° 2017-1432 du 4 octobre 2017 portant modernisation du cadre juridique de la gestion d'actifs.
[177] For a brief overview of the task of the ACPR, see https://acpr.banque-france.fr/en/authorisation/banking-industry-procedures/licensing-authorisation-and-registration/finance-company (accessed on 3 December 2020).

6) the activity must be effectively run by at least two people, whose knowledge, experience and fitness must be demonstrated, both individually and collectively, as must their availability; these persons must also meet the propriety requirements for their position;

7) members of the governing body must satisfy knowledge, experience, fitness and propriety requirements, both individually and collectively, and also meet the availability requirements;

8) managers of key functions must meet propriety, knowledge, experience and fitness requirements;

9) assets must exceed liabilities by an amount that is at least equal to the minimum capital requirement.

As for prudential treatment, finance companies, together with factoring and leasing providers, are subject to solo prudential requirements. According to French law, finance companies are subject to the provision dictated in CRR for credit institutions within the meaning of the CRD IV. In short, France makes use of a bank-equivalent approach for the prudential regulation of the société de financement. This is consistent with the policy stance enacted by the broader French legal framework under which all entities carrying out any form of bank-like loan origination activities are subject to solo prudential requirements[178]. Accordingly, the ACPR is in charge of the prudential supervision of those entities which are not credit institutions under EU law: entreprises d'investissement, sociétés de financement, payment institutions et de monnaie électronique, succursales en France d'établissements de crédit de pays tiers. Every year the ACPR Supervision Committee (collège de supervision), at the suggestion of the Secretariat General, establishes the supervision priorities for the following 12 months. This is an annual plan laying down the strategy for on-site and off-site controls tailored to the risks and concerns that have arisen up until that time[179].

Considering the above, it is clear that the French approach to non-bank financial intermediation is very cautious. It gives high priority to targeting and curbing in advance any form of systemic risk emerging from non-bank entities even at the cost of placing significant barriers for non-bank lenders looking to lend in France in terms of regulatory costs. Overall, the compliance costs incurred by finance companies due to the joint application of rules replicating the CRR, CRD IV and Basel III requirements impact the cost of alternative sources of credit for French corporations[180].

[178] European Banking Authority (2014), 18.
[179] For example, for 2017, FinTech and new payment service providers ranked high among the priorities of the French Authority. See ACPR (2017).

[180] Sultan et al. (2019), 80.

1.5.2 Germany

German law addresses lending with an approach resembling the French one. The primary legal basis for the supervision of banks and financial service providers is the German Banking Act (Kreditwesengesetz – KWG) together with EU legislation (CRR, CRD IV and SSM Regulation[181]). The German Federal Financial Supervisory Authority (BaFin) and the Deutsche Bundesbank share banking supervision in Germany. Their cooperation is governed by Section 7 of the German Banking Act (Kreditwesengesetz – KWG), which stipulates that, among other things, the Deutsche Bundesbank shall, as part of the ongoing supervision process, analyse the reports and returns that institutions must submit on a regular basis and assess whether their capital and risk management procedures are adequate.

According to Section 32 and 33 of the German Banking Act, a written authorisation from BaFin is required for anyone wishing to perform lending on a regular and professional basis by way of commercially organised business operations[182]. This applies regardless of the nature of the borrower (consumer or firm) and to lenders based abroad that actively target potential borrowers domiciled in Germany. The meaning of lending is interpreted broadly under the established practice of the German Federal Financial Service Supervisory Authority. Therefore, financial service institutions under Section 1a of the German Banking Act (namely undertakings which provide financial services to others commercially or on a scale which requires commercially organised business operations, and which are not credit institutions) must also file an application to BaFin for authorisation to originate loans.

In order to obtain the licence, a credit service institution must meet certain prudential requirements involving its ability to maintain certain liquidity and solvency ratios and share capital. Amongst other things, it must demonstrate that:

- it is endowed with minimum or initial capital, which will depend on the nature of its intended business;
- it has at least two management board members, who must be "fit and proper";

[181] Regulation (EU) No 1024/2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions.
[182] Schmies et al. (2019) 93.

- the applicant must also declare anyone having significant holdings in the proposed institution and the size of any such holdings;
- it has a viable business plan indicating the nature of the proposed business, the organisational structure and the proposed internal control systems.

Notably, finance companies are obliged to comply with internal organisation and governance rules mandated for credit institutions (i.e. appointment of risk management, control and compliance officers).

Exemptions from banking licence requirements are provided for insurance companies as long as their credit provision activities are compliant with the German insurance regulation. Furthermore, management companies, alternative investment fund managers (AIFMs), and EEA undertakings for collective investments are not subject to the German Banking Act licensing requirement.

Notably, in 2018 BaFin approved 17 new applications for authorisation pursuant to Section 32 of the Banking Act[183]. A total of 24 authorisations terminated in 2018, mainly as a result of waivers, in some cases also due to mergers. The number of (pure) finance leasing institutions subject to ongoing supervision by BaFin fell to 311 in 2018 (previous year: 322 institutions), while the number of (pure) factoring institutions reduced to 158 (previous year: 163 institutions). In addition, 28 institutions provided both finance leasing and factoring services; these services were offered by 28 banks in the previous year.

From a prudential angle, Germany applies to credit service providers the provisions of the CRR as though the entities concerned were 'credit institutions' within the meaning of the CRD IV/CRR[184]. However, BaFin explicitly confirmed its willingness to make full use of the principle of proportionality referred to in CRR and CRD IV to develop approaches for the proportionate gradation of the supervisory requirements to small and non-complex credit institutions[185].

From a competitive angle, BaFin has highlighted that financial services specialisation allowed some of them to enjoy significant margins in 2018. Remarkably, this reflects the competitive advantages gained by “the institutions able to benefit from new technologies or cooperative arrangements with FinTech companies”[186].

[183] Federal Financial Supervisory Authority (2019), 83.
[184] European Banking Authority (2014), 18.
[185] Federal Financial Supervisory Authority (2019), 68.
[186] Federal Financial Supervisory Authority (2019), 78.

1.5.3 United Kingdom

The United Kingdom is a comparatively straightforward jurisdiction from a regulatory perspective for private credit managers seeking to originate and provide loans to commercial businesses. Non-banking lenders, such as community development finance institutions (CDFIs) and credit unions, may lend directly to individuals and businesses. CDFIs operate under the Consumer Credit Act while credit unions are regulated by several laws. Typical structures used include UK, EU or third country AIFs, SPVs owned by such AIFs or securitisation or SPV vehicles being used as warehouse structures for CLO vehicles[187].

For pre-lending/loan origination activities, there is no banking licence or regulatory requirement in the UK. Invitations and inducements to engage in providing loans (such as finding borrowers or origination activities) should not be covered by the UK financial promotion regime, as primary lending is not considered to be an investment activity for these purposes.

For primary lending activities, there are unlikely to be any legal or regulatory licensing or authorisation requirements in the UK where a fund (or an SPV owned by a fund) is granting loans to UK borrowers.

There is withholding tax in the UK on interest payable by UK borrowers to non-UK lenders, in the absence of an exemption or mitigation, such as a double tax treaty. There is also a lack of choice of local fund vehicle structures in the UK on the corporate side in order to benefit from available tax exemptions and tackle changes in securities regulations which impact loan origination.

The Financial Conduct Authority (FCA) supervises the lending activities of CDFIs for credit offered to individuals and businesses. The responsibilities of the FCA include:

a) ensuring consumer protection by regulating how firms treat their clients;

b) assessing the affordability of their lending;

c) assessing the soundness of financial institutions.

1.5.4 Spain

Spain is a comparatively straightforward jurisdiction from a regulatory perspective for private credit managers seeking to originate and provide loans to commercial businesses. In Spain, neither loan origination nor any pre-lending activity (such as soliciting, advertising, inducing,

[187] EMN (2019) Legislative Mapping Report – UK.

arranging/originating activities to find borrowers) is a reserved activity or an activity subject to a credit institution or financial institution licence. As a result, loan origination through domestic and foreign vehicles is possible under Spanish regulation and no credit institution licence is required in order to carry out this activity (although some consumer body registration requirements must be met in respect of the origination of consumer mortgage loans)[188].

Non-banking lenders, in the form of foundations, associations, and limited companies, are allowed to offer loans under the law on consumer credit agreements (16/2011). Additional non-banking lenders in the Spanish market include financial cooperatives that offer loans to their members and credit unions, which are considered to be banking intermediaries along with saving banks and banks[189].

The Central Bank of Spain (Banco de España) supervises other institutions apart from credit institutions, namely Specialised Credit Institutions (Establecimientos Financieros de Crédito - EFCs). Pursuant to Article 1 of Royal Decree 692/1996, this term means legal entities pursuing as their principal business activity lending (including consumer credit, mortgage credit and financing of commercial transactions), leasing (financial leasing with option to buy), 'factoring' (transfer of a credit portfolio), consumer credit, mortgage lending, cards and guarantees, amongst others.

Specialised lending institutions are entities which perform credit operations in very specific fields. Even though their typical activity can vary according to the specific business methods implemented (loans, factoring, leasing, mortgage loans, provision of guarantees), they are subject to the same prohibition on taking deposits, loans, temporary assignment of financial assets or other comparable instruments from the public[190]. Moreover, they can also act as hybrid payment institutions once they obtain authorisation to provide payment services.

The new legal framework enshrined in Ley 5/2015 on the promotion of business financing excluded the status of credit institution for these entities, but nevertheless confirmed they were subject to financial regulation and supervision[191]. For example, in Spain, specialised credit institutions are no longer considered 'credit institutions' (on the basis that they do not accept deposits from the public

[188] Finally, micro-lending activities in Spain are not supervised by any institution and there is no self-regulatory framework in place. However, credit unions are required to share customer data with the National Credit Bureau and they can also access data from the National Credit Bureau, which is administered by the Spanish Central Bank. In addition, there are private credit bureaus which receive "unpaid and default loan data'' of legal and natural persons from institutions such as banks, credits unions, utilities companies, etc.
[189] EMN (2019) Legislative Mapping Report – Spain.
[190] Royal Decree 692/1996, Article 2. https://www.bde.es/f/webbde/SJU/normativa/eng/ficheros/en/rd69296.pdf (accessed 1 April 2020)
[191] Ley 5/2015, de 27 de abril, de fomento de la financiación empresarial. (BOE de 28).

and do not, as part of their business, continually issue bonds (other repayable funds) and therefore do not meet the first condition to be known as a 'credit institution' under the CRR[192].

Unlike Germany, in Spain a bespoke prudential regime has been put into place for the prudential treatment of specialised credit institutions. Admittedly, the authorisation specifications of specialised credit institutions are similar to those of banks, albeit with requirements proportionate to their complexity, size, business profile and specific features, particularly lower minimum capital. Their legal framework is currently regulated by Royal Decree 692/1996 of 26 April 1996 on the legal regime of specialised credit institutions. Pursuant to Article 3 of this legislation, the Ministry of Economy, Industry and Competitiveness of Spain is in charge of authorising specialised credit institutions. Specialised credit institutions are registered on the Companies Register held by the Bank of Spain.

As specialised credit institutions are prevented from taking deposits from the public, they are subject to less demanding rules on the requirements for pursuing their activity in comparison with banks[193]. Accordingly, they are expected to seek alternative channels for their financing. Furthermore, specialised credit institutions do not have to comply with a limited operating capacity and are allowed to pursue one or more of the activities typical of credit institutions (lending, factoring, financial leasing, issuing and administering credit cards, and provision of guarantees and similar commitments). Consequently, according to Spanish law, specialised credit institutions are required to have minimum share capital less than that required for the incorporation of banks and the minimum number of members of the board of directors of the entity is lowered.

From a prudential perspective, Royal Decree 692/1996 of 26 April 1996 establishes two requirements for ensuring reinforced prudential supervision of specialised credit institutions, namely:

- Article 5(g) of the law requires both the institution's registered office and its effective management and administration to be located in Spanish territory in order to avoid harmful

[192] European Banking Authority (2014), 16.

[193] Royal Decree 692/1996, Article 5 reads as follows: "1. The following requirements must be met in order to obtain and maintain authorisation as a specialised credit institution: a) The entity must be organised as a public limited company incorporated by the simultaneous foundation procedure for an unlimited duration. b) It must have a minimum share capital of 850 million pesetas, fully paid up in cash and represented by registered shares. c) The corporate objects must be restricted in the articles of association to the activities of a specialised credit institution. d) The shareholders with significant holdings must be considered suitable, within the meaning of these terms under this article and article 7. e) It must have a board of directors of not less than three members. (…) f) The entity must have sound administrative and accounting procedures and adequate internal control mechanisms that ensure sound and prudent management of the entity. g) The registered office, and the head office, must be situated in Spain. h) It shall have adequate internal control and communication procedures and bodies to anticipate and prevent the performance of transactions relating to money laundering"

regulatory arbitrage within the Internal Market in the realm of the non-banking lending market, so as to carry out lending in the Spanish territory;

- Article 7(b)(5) of the law states that the Ministry of Economy, Industry and Competitiveness shall not grant the authorisation if the applicant's shareholders maintain close links with natural or legal persons that could hinder effective prudential supervision.

1.5.5 Italy

Since the entry into force of the Italian Consolidated Law on Banking in 1993, the Italian prudential framework has been characterised by a relatively broad regulatory perimeter[194]. The financial entities subject to banking supervision not only consisted of commercial banks (i.e. deposit takers), but also various non-banking institutions and instruments (in particular securitisation firms).
Supervision consisted of monitoring activities and off-site analysis supported by extensive regulatory reporting and on-site inspections. It is widely believed that these specific regulatory features of the Italian regulatory and supervisory framework made a significant contribution to protecting the domestic system from financial crisis and vulnerabilities to systemic risk[195]. In particular, the Consolidated Law on Banking and the Consolidated Law on Financial Intermediation[196] are thought to have formed an adequate supervisory toolbox to address consistently prudential supervision on various activities and entities.

Following the financial crisis, the supervisory and regulatory framework underwent a revision process led by the reforms promoted by several international bodies and standard setters, such as the ESMA, the EBA, the Basel Committee, the European Commission, and the ESRB). Overall, insofar as prudential requirements and regulatory tools are concerned, the current regulatory landscape does not make substantial distinctions between investment firms, finance companies and 'traditional' commercial banks[197].

[194] For an overview of the topic from an economic and legal perspective, see Gola et al. (2019).
[195] Public bailouts in the Euro zone have been reported by the ECB at 5.1 % of GDP for the period 2008-2013: Ireland (37.3%), Greece (24%), Slovenia (14.2%), Cyprus (10.5%), Portugal (10.4%), Germany (8.8%), the UK (6.3%), the Netherlands (6.1%), Luxembourg (5.7%), Latvia (5.0%), Spain (4.9%) Belgium (3.9%) and Austria (3.1%). Notably, France and Italy conducted relatively minor interventions. As far as Italy is concerned, most of the difficulties in the banking sectors surfaced subsequently and were unrelated to market-based intermediation. In fact, they stemmed from the effects of deep economic recession, which affected the country.
[196] Legislative Decree no. 58 of 24 February 1998 - Consolidated Law on Financial Intermediation, pursuant to Articles 8 and 21 of Law 52 of 6 February 1996 (as amended by Legislative Decree no. 124 of 26.10.2019, by Legislative Decree no. 165 of 25.11.2019 and by Law no. 160 of 27.12.2019. http://www.consob.it/web/consob-and-its-activities/laws-and-regulations (accessed 27 March 2020).
[197] Carlo Gola et al. (2019), 17.

The Italian financial industry is centred around the major role played by commercial banks, each of them including a vast network of subsidiaries, branches and special purpose entities. Such an industrial organisation structure is the outcome of quite a lengthy evolution triggered by the denationalisation of several banks in the first half of the ’90s. This process reshaped the Italian banking system and gave the supervisory authorities the task of promoting aggregations of banks while avoiding the risk of extreme concentration.

As for the Italian non-bank lending industry, since the early ‘80s the most significant activities have been leasing, factoring and consumer credit. They flourished due to the development of new alternative forms of credits coupled with a monetary policy based on applying a ceiling to the growth of bank lending (which favoured non-banking lenders). The first version of the Italian Consolidated Law on Banking in 1993 which replaced Law 52/1991 and 197/1991 established the initial regulation of these activities. Thereafter, the sector has also been regulated with reference to anti-money-laundering.

1.5.5.1 The Italian regulatory perimeter

Under Italian law, the requirements for banking authorisation are enshrined in Article 11 of the Consolidated Law on Banking[198]. Since the '70s such a rule (with limited exceptions) allowed for the centrality of banking intermediation for providing society with access to financing. Debt instruments, such as bonds, were confined within narrow boundaries. This legal framework was intended to maintain the four key features of credit intermediation (i.e. credit risk transfer; leverage; liquidity transformation and maturity transformation) as a prerogative of traditional banks. In order to avoid so-called runs of depositors and liquidity crises, Italian policy makers opted for an authorisation regime conditional upon well-defined requirements (i.e. capital, legal entity, honour and integrity of directors, etc.) for banking activity coupled with prudential requirements (i.e. corporate governance special rules, own funds, control rules), pursuant to Articles 14 and 53 of the Consolidated Law on Banking. Furthermore, banks were placed under a strict supervision regime as well as being subject to rules of conduct with reference to relationships with customers and third party providers.

Since 1991, the professional granting of credit has been reserved to financial intermediaries, according to the Consolidated Law on Banking (Title V). It is worth noting that, in the initial phase, as no interference was detected between traditional banking and financial intermediaries, the latter were subject to light touch non-prudential regulation focusing on anti-money laundering and fraud

[198] Italian Legislative Decree 385/1993 (Consolidated Law on Banking).

detection. Only the biggest intermediaries were obliged to comply with prudential regulation, authorisation process, regulatory supervision, inspections and reporting duties (pursuant to Art. 107 of the Consolidated Law on Banking). These rules were intended to curb the systemic risk generated by strongly interconnected financial intermediaries.

Over the years, this legal framework underwent an evolution process aimed at tackling the new needs of corporate finance and developing new financial channels. Currently, a number of financial entities do not fall within the perimeter of banking activity. In particular, electronic money institutions under Directive 2009/110 and payment service providers are included in this category. Therefore, they can receive funds in order to perform their core activity without running the risk of being targeted as banks by regulators.

The entry into force of Legislative Decree 141/2010 significantly altered the legal landscape by removing the distinction between financial intermediaries pursuant to Article 106 and Article 107 of the Consolidated Law on Banking. In addition to loan origination, they can issue electronic money, provide payment services and perform specific services as well as carrying out investment activities (e.g. initiating and executing payment orders). These financial intermediaries are now subject to prudential requirements, authorisation processes, banking-like supervision (known as equivalent supervision - "vigilanza equivalente"). These rules are, indeed, similar to those applied to banks, but with some facilitations with reference to capital requirements, capital adequacy, corporate governance rules, risk assessment and temporary exemption from some provisions of CRR and CRD IV[199]. Moreover, the provisions relating to ownership of financial intermediaries are aligned with the requirements of Directive 2007/44/EC, relating to the acquisition of qualifying holdings in banks, investment firms, insurance companies and management companies, as amended by the CRD IV.

Turning to shareholdings, it is worth noting that financial intermediaries are subject to the same rules that apply to banks[200]. All financial intermediaries must comply with prudential requirements on both an individual and a consolidated basis. In addition, when a financial intermediary is controlled by a financial holding company – not regulated itself – if this financial holding company qualifies as a parent company, it must comply with prudential requirements on a consolidated basis. There is no doubt that the full CRDIV/CRR framework applies directly if the financial intermediaries are part of a banking group. The rules establishing the consolidation levels are those applied to banks (based on IAS/IFRS and the CRR framework).

[199] In particular, with regard to financial leverage and liquidity reserves, see Banca d'Italia (2015).
[200] Gola et al. (2019).

This tightening of legislation reflects the general mistrust for the so-called shadow banking system following the 2008 crisis. Notably, the Bank of Italy justified this regulatory change by referring to the need to guarantee sound and prudent management of non-banking financial intermediaries as well as the financial stability of the system as a whole[201]. Moreover, it has also been argued that this move was aimed at rendering homogeneous the interactions between traditional banks and non-banking financial intermediaries[202]. Conversely, such a heavy regulatory burden placed on entities that are not deposit takers from the public was criticised as being excessively skewed against non-banking players[203]. Similarly to banks, financial intermediaries are subject, under Article 106 of the Consolidated Law on Banking, to transparency rules pursuant to Article 115 and consumer credit conduct rules[204]. More generally, whenever a business-to-consumer contractual relationship is at stake, the Consumer Credit Directive and the Mortgage Credit Directive apply, imposing pre-contractual informational duties, credit assessment, cancellation rights and early repayment rights at any time[205].

In the Italian debt market, the most common loan originators are banks and financial intermediaries listed on the register (i.e. authorised) indicated in Article 106 of the Consolidated Law on Banking. As explained above, under Italian law the activity of loan origination is a reserved activity requiring authorisation from the Bank of Italy. Private credit managers authorised under the Alternative Investment Fund Managers Directive are also permitted to carry out loan origination in Italy, albeit on a restricted basis. Private credit managers have only been permitted to carry out loan origination activity since 2016 and currently form a very small part of the Italian loan origination market. Italian credit funds are permitted to perform direct lending within a specific regulatory framework.

The conduct of pre-lending activities (e.g. soliciting, advertising, inducing, arranging/originating activities to find borrowers), along with promotion and marketing activities carried out in Italy for the purpose of granting loans by funds to borrowers are restricted by Italian laws and regulations and subject to strict licensing requirements.

[201] Banca d'Italia (2014), 3.
[202] Lemma (2011), 186-189; Capriglione and Lemma (2018), 1575-1576.
[203] Antonucci (2012), 105, 114-115.
[204] Directive (EU) 2014/17 on credit agreements for consumers relating to residential immovable property [2019] OJ L 60/34.
[205] Italian Legislative Decree 385/1993, Articles 121 et seq..

1.6 Concluding remarks

As can be seen from the previous sections, it is clear that the issue of the regulation of non-bank lending is a hotly debated one. The potential options range across a spectrum of different approaches. For instance, in the United Kingdom the area was left unregulated, whereas in Germany and France market-based lending has been subjected to an authorisation regime as it is equated to traditional banking activity[206]. Conversely, in Italy, a special regime was put into place in order to target the issue.

This concluding section argues that the Italian approach, based on banking-like regulation, is likely to jeopardise the potential of FinTech innovation as it places on new entrants an excessively high regulatory barrier to entry (represented by prudential banking rules). While the need to keep systemic risk under control as well as to ensure the sound and prudent management of non-banking financial players is crucial, regulators and policy makers should be careful not to preclude technological innovation and new forms of competition within the financial sector.

1.6.1 A critique of the Italian functional approach

Under the Consolidated Law on Banking, only financial intermediaries authorised by the Bank of Italy can grant credit in any form to the public. In turn, these entities are mandated to comply with banking-like prudential regulation (i.e. internal and risk assessment controls, capital adequacy, limitation of risk) and are under the supervision of the Bank of Italy.

Within the Italian legal framework, the legislative reform concerning financial intermediaries was based on Legislative Decree 141/2010, which amended the Consolidated Law on Banking. It was then completed by Ministerial Decree 53/2015, which identified the activities subject to reserve. The Bank of Italy was entrusted the task of establishing the supervisory system for financial intermediaries and groups of financial intermediaries. Those provisions were enshrined in Circular no. 288 of 3 April 2015 (the Circular) issued by the Bank of Italy.

The Bank of Italy has recently published a new version of Circular no. 288, on supervisory provisions for financial intermediaries subject to the supervision of the Bank of Italy, following the review of Title V of the TUB (Testo unico bancario, Italian Single Rulebook for banks), implemented by Legislative Decree 141/2010. These provisions entered into force on 12 July 2015. Circular no. 288

[206] For an up-to-date comparative overview, see Alibrandi et al. (2019), 208-244.

is composed of seven Titles, in turn divided into seven Chapters. In a nutshell, the main points of the Circular are the following:

Firstly, on minimum capital and authorisation for engaging in granting of credit: depending on whether the intermediary carries out activities of issuing guarantees, the minimum capital threshold is Euro 2 or 3 million. According to the proportionality principle, for financial intermediaries adopting the status of cooperative companies based on prevailing mutuality (società cooperativa a mutualità prevalente) and carrying out only activities of granting funding, the initial minimum capital is Euro 1.2 million; for pawnbrokers, the minimum capital is Euro 600,000.

Secondly, the parent company of a financial group can be both a financial intermediary and a financial society. Financial intermediaries, financial societies, and non-EU banking societies which are subsidiaries of the parent financial intermediaries or of the parent financial society are included in the scope of the financial group.

Thirdly, the granting of funding and servicing can be considered typical activity of financial intermediaries. These entities may also carry out other complementary activities.

Fourthly, in relation to the ownership structure, the provisions are in line with Directive 2007/44/EC (on the purchase of qualifying holdings in banks, investment and insurance companies, and management companies) and the European Supervisory Authorities (ESA) Implementing Guidelines.

Fifthly, as for organisation and controls, the Circular deals with general requirements of organisation (internal information flows, administrative and accounting procedures, safeguarding measures for business continuity), and corporate governance rules, establishing the minimum tasks and responsibilities of corporate bodies, internal control system, outsourcing of corporate functions, characteristics of the informative-accounting system, organisation requirements to address risks deriving from specific activities (granting credits, servicing, etc.). Notably, the principle of proportionality takes centre stage in this Title as some simplifications are envisaged for minor intermediaries. For instance, in the area of governance rules, ‘minor intermediaries’ are allowed to assign executive functions to the Chairperson of the Management Board.

Sixthly, the Circular confirms the choice of applying to financial intermediaries the same prudential regime as banks (CRR and CRD IV), with the necessary adjustments. According to the proportionality principle, the provisions introduce, on the one hand, some specific treatment for financial intermediaries referring to capital levels (intermediaries that do not carry out activities of collection of public savings can keep a capital requirement for credit and counterparty risk equal to 6%; for factoring, considering the tri-laterality that characterises the relationship for granting credits,

intermediaries ascribe the exposures to the transferred debtor for the purposes of calculating the capital requirement for credit risks; with regard to risk concentration, until 31 December 2017, the limit of 25% of the eligible capital can be exceeded applying an additional specific capital requirement (up to 40% of the eligible capital); on the other hand, the provisions do not envisage the application of the rules on liquidity, financial leverage, capital conservation buffer and capital counter-cyclical capital buffer.

The goal pursued by the Bank of Italy with the Circular is to avoid any risk of regulatory arbitrage as well as to tackle systemic concerns related to shadow banking[207]. Furthermore, it is clear that this regulatory approach intends to increase the quality of the services provided to consumers and restrict access to the credit market only to the most solid entities. Finally, the heavier regulatory burden arising from the Circular brings some advantages to financial intermediaries. Indeed, access to funding from banking entities will be easier for financial intermediaries as they would represent economically reliable counterparties for banks under prudential regulation.

On the flipside, it is worth mentioning that the regulatory approach enacted with the Circular applies similar rules for entities that are different not only from a dimensional and operational perspective. Banking-like regulation might appear inherently unfit for firms that do not, in fact, engage in deposit taking. Furthermore, it should be noted that financial intermediaries are most likely to target unbanked consumers that are already outside the scope of banking activity (often for reasons related to creditworthiness and risk assessment). In light of these considerations, implementing same rules for different activities could be inappropriate and harmful from an economic perspective. In fact, the net result of such a regulatory decision is to diminish market-based financial intermediation, as financial firms would prefer to look to obtain a banking licence or else exit the credit market as no other solution would be economically viable. This would frustrate one of the main benefits of market-based financial intermediation, namely the possibility of funding the real economy with alternative channels that enjoy more freedom than banks in targeting promising (but also risky) entrepreneurial projects.

In order to overcome this problem, one solution could consist of designing new rules able to fully harness the principle of proportionality. This would mean that only financial intermediaries that actually increase the systemic risks for financial stability, due their level of interconnectedness with the financial system or their size, should fall under the umbrella of banking-like regulation[208].

[207] Banca d'Italia (2014).

[208] Notably, an interesting reference point could be represented by the US FSOC. The goal of this authority is to supervise cross-sectional aspects of systemic risk. Its aim is twofold. Firstly, the FSOC focuses on threats posed to stability by systemically important financial institutions ('SIFIs'). Secondly, it must respond to 'emerging threats' to the stability of

Accordingly, small and less significant financial intermediaries should not be burdened with such strong regulatory requirements and should be permitted to navigate the credit market, performing their business activity by targeting firms and individuals that do not enjoy access to bank funding. It is worth highlighting that this would not pose level playing field concerns as financial intermediaries are expected to engage with an area of the market that is not currently served (or is inadequately served) by the banking sector.

Indeed, the regulatory mechanism enacted in current legislation with reference to non-banking financial players is just half the story as it only tells us how the current legal environment may allow the entry of FinTech-enabled business methods. Thus, a demand-side argument is that markets only have the capacity to self-correct if consumers can switch and/or multi-home between competing firms[209]. This proposition is the focus of the next chapter.

the US financial system by designating other firms for which it considers the status of "systemically important" to be appropriate. See Armour, Awrey, Davies, Enriques, Gordon, Mayer, and Payne (2016), 610.

[209] Konstantinos Stylianou, 'Exclusion in Digital Markets' (2018) 24 Michigan Telecommunications & Technology Law Review 181, 223 ('If consumers find it hard to access or switch to substitute products or services, then intense competition on the supply side will be of little help, as unmet supply will eventually wither. If, on the other hand, there are low or no switching barriers and multiple ways by which consumers can access their desired products and services, then the full potential of enhanced supply side competition can be materialized').

CHAPTER 2 - Systematizing the FinTech regulatory toolbox

Short abstract of the chapter

The chapter looks at the regulatory approaches to FinTech that have emerged thus far and places them into a systematic framework. Firstly, it provides a categorisation of the main regulatory strategies that legislators on both sides of the Atlantic can enact to tackle the challenges of FinTech innovation. Consideration is given to experimentation tools, such as innovation hubs, regulatory sandboxes, special FinTech charters, and mentorship regimes. Secondly, the new emerging trend of responsive regulation (or smart regulation) is investigated, also focusing on its main downsides. The European Union and the United Kingdom stand out as leading testing grounds of such new strategies. Finally, the chapter introduces the concept of pro-competitive regulation as the most advanced stage of a policy strategy aimed at harnessing the potential of FinTech while countering its risks to public welfare.

2.1 Introduction. An overview of the regulatory toolkit

The advent of FinTech as a main driver of evolution in the financial industry over the last decade requires policy makers to address a broad range of regulatory and legal challenges. The most fundamental issues underlying FinTech development concern monetary policy and financial stability, with competition dynamics also ranking high in regulators' and legislators' innovation roadmap[210]. Providing answers to such fundamental issues is undoubtedly a gradual and complex process, which is likely to diverge throughout the different jurisdictions in Europe, the United States and Australia.

It is worth noting that the spread of FinTech-enabled financial services and business models is heavily dependent on the regulatory perimeter adopted by each jurisdiction. As highlighted in the second part of chapter one, the success of FinTech depends on whether non-banking players that provide lending or payment activities by means of technological breakthroughs fall under the regulatory regime of supervision and, in turn, are subject to imposing bank-like prudential regulations. Indeed, FinTech innovation has been fuelled not only by technological development and efficiency considerations, but also by regulatory arbitrage[211]. For instance, the surge in FinTech lending seen in the US and the

[210] Omarova (2020).

[211] See Armour, Awrey, Davies, Enriques, Gordon, Mayer, and Payne (2016), 435, highlighting that regulatory arbitrage, seen as a corporate practice of utilising more favourable laws in one jurisdiction to circumvent less

decline in the market share held by traditional banks is correlated with a lower regulatory burden on FinTech shadow banks[212]. In the same vein, non-banks have benefitted from technological developments driving the transition from cash to electronic payments, as the performance of core payment functions has become less expensive[213].

Thus far, cutting-edge providers of FinTech services are not regulated consistently under most jurisdictions around the globe. Among these, we find crypto-assets, technological services outsourcers (e.g. firms using AI to extract content from financial documents and compliance; big data analysis; platforms using machine learning to prevent fraud; firms using AI for credit risk analysis), platform-enabled services (crowdfunding, peer-to-peer lending), marketplace service providers (two-sided platforms connecting borrowers and lenders, businesses and potential customers), intermediation services, comparison services, and credit reference services[214]. Admittedly, as all these activities share an ancillary nature compared to financial services, they fall outside the traditional regulatory perimeter[215]. For instance, they can be limited to the provision of technical support, IT solutions, and automated compliance. In the same vein, big data analytics services employed in finance do not necessarily fall under ordinary financial regulation.

Given that FinTech developments have their pros and cons[216], policy makers, scholars and regulators are still gauging how best to deal with the phenomenon. As the industry is still at an early stage of development, it would be premature to offer a detailed framework of all FinTech-related regulatory initiatives that have emerged thus far across the globe. However, it is useful to look at some of the crucial elements shared by most of these developments. By identifying the main strategies available to regulators in Europe, the US and Australia, it is easier to position the numerous innovative emerging tools in a coherent framework. Since the regulatory background significantly affects innovation, competition, and consumer welfare, it is worth systematising the current regulatory strategies that have arisen worldwide to help market players and scholars navigate the current legal environment.

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favourable regulation elsewhere, plays a significant role in favouring the emergence of new FinTech-enabled business methods over traditional banking practices within a specific jurisdiction.

[212] FinTech shadow banking system usually means a group of financial intermediaries facilitating the creation of credit across the global financial system by means of technology-enabled mechanisms, but whose members are not subject to regulatory supervision. For an in-depth investigation of FinTech shadow banking see chapter 1, section 2. See also Buchak, Matvos, Piskorski, and Seru (2018).

[213] Awrey and van Zwiete (2019).

[214] European Banking Authority (2019d), 13-14.

[215] European Banking Authority (2019), 16.

[216] See Chapter 1, Section 1.1 for an in-depth investigation of the matter.

Furthermore, such an issue is closely related to regulatory competition between jurisdictions for attracting human capital, promoting investments, and achieving economic growth. As is already happening within the realm of electronic money institutions within the European Internal Market, there is a risk that jurisdictions may make crucial proactive interventions in order to attract FinTech firms and providers by way of regulatory easing[217]. This normative option could give rise to dangerous inconsistencies with reference to market access by FinTech credit institutions. As highlighted in chapter 1, issues of unlevel playing fields on the financial markets are likely to risk financial stability with serious negative repercussions on the real economy. Against this background, policy makers ought to be aware of the trade-offs involved in more or less interventionist approaches.

It is important to note that such an exercise of systematisation is not intended to list comprehensively all possible regulatory initiatives in the field of FinTech[218]. Rather, the chapter aims to develop a conceptual framework for presenting the most advanced stage of FinTech responsive regulation (or "smart" regulation) which is the pro-competitive paradigm.

2.2 The three main FinTech policy strategies

As a consequence of the 2008 financial crisis, policy makers implemented a very cautious approach to innovation over the following decade. The rapid evolution of FinTech, however, increased the policy pressure to facilitate economic growth as well as to enhance financial inclusion and to support innovation[219]. Therefore, while regulators are always required to oversee prudential risks, they are, at the same time, expected to support innovation and particularly digital disruption. This means balancing the support for innovation with their core regulatory mandates of financial stability and consumer protection. Three main strategies have emerged thus far to address this challenge. In essence, policy makers and regulators have three options to choose from: *laissez-faire*, structured experimentalism and new tailored or responsive regulation[220].

It is worth noting that these three approaches are not mutually exclusive. Rather, they should be seen as building blocks of a modern regulatory toolbox that has arisen over recent years. Depending on the level of development and the potential of a FinTech breakthrough, they can be deployed in complementary ways or used in succession by regulators. A clear example of this strategy comes

[217] Enriques (2019).
[218] For this reason, the chapter does not deal with regulators' assessment involving the legal categorisations of specific financial products (such as commodities, digital currencies, new securities, etc.) or technologies (such as the distributed-ledger technology).
[219] Global Partnership for Financial Inclusion (2017)
[220] Amstad (2019); Arner, Barberis, Buckley, and Zetzsche (2017), 43-46.

from the EU regulatory approach to crowdfunding. Only after having monitored their impact on the industry and the reaction of individual Member States did European authorities start evaluating whether the current financial regulation framework could effectively be applied to these new platforms[221]. Eventually, a new piece of regulation was designed in order to ensure a level playing field as well as cross-border development within the Internal Market[222]. In the same vein, European regulators have started gauging the impact and the regulatory concerns involving crypto-assets[223].

2.2.1 The laissez-faire strategy

Under this initial strategy, firms are free to develop and make use of FinTech breakthroughs within the ordinary regulatory framework. Accordingly, as long as the service at issue is not widespread and does not raise serious economic and systemic concerns, the supervisory authorities usually take a wait-and-see approach[224]. However, this strategy does not necessarily entail a passive attitude towards digital innovation in the financial markets. Regulators and policy makers are expected to continue to monitor the industry to target in advance any potential risk to financial stability, data protection, competition and consumer welfare.

Admittedly, this methodology, based on the avoidance of fully-fledged legislative interventions, still requires regulators to engage proactively with market developments. Indeed, they are not prevented from making use of so-called soft-law instruments, such as guidelines, reports and communications to warn market players and to coordinate actions with other authorities (especially in relation to

[221] European Commission, 'Unleashing the potential of Crowdfunding in the European Union', COM (2014) 172 final; European Commission, 'Crowdfunding in the EU Capital Markets Union', Staff Working Document SWD(2016) 154 final; European Commission, 'Identifying market and regulatory obstacles to cross-border development of crowdfunding in the EU', (2017) <https://ec.europa.eu/info/sites/info/files/171216-crowdfunding-report_en.pdf> accessed 10 March 2020.

[222] European Commission, Proposal for a regulation of the European Parliament and of the Council on European crowdfunding service providers (ECSP) for business, COM (2018) 113 final.

[223] The matter was first targeted by the European Banking Authority, 'EBA Opinion on virtual currencies', (2014) <https://eba.europa.eu/sites/default/documents/files/documents/10180/657547/81409b94-4222-45d7-ba3b-7deb5863ab57/EBA-Op-2014-08%20Opinion%20on%20Virtual%20Currencies.pdf?retry=1> accessed 10 March 2020. Recently, more detailed recommendations were put forward by the European Banking Authority, 'Report with advice for the European Commission on crypto-assets', (2019) <https://eba.europa.eu/sites/default/documents/files/documents/10180/2545547/67493daa-85a8-4429-aa91-e9a5ed880684/EBA%20Report%20on%20crypto%20assets.pdf?retry=1> accessed 10 March 2020.

[224] See Arner, Barberis, Buckley, and Zetzsche (2017), 43-44, identifying China as a leading example of this more permissive approach, particularly until 2015. Admittedly, the Chinese government decided to prioritise FinTech innovation and growth in order to tackle the inefficiencies of the Chinese financial system. As noted by Claessens, Frost, Turner, and Zhu (2018), 36, FinTech development is greater in jurisdictions where accessing credit is more difficult and less advanced (as in China).

sensitive matters, such as anti-money laundering and consumer protection)[225]. However, leaving a dynamic and rapidly evolving area such as FinTech entirely unregulated exposes regulators and market players to hidden risks related to interconnectedness between firms that might undermine the foundation of the financial system in terms of instability, market monopolisation and disruptive competition[226]. Thus, this strategy is more suited to targeting new developments in FinTech innovation rather than fully-fledged changes to the industry.

Current forms of financial regulation have evolved in the last decade towards a functional approach, which is now widely regarded as the reference point for market supervision[227]. This school of thought requires regulators to understand how FinTech business models and players work, both collectively and separately within the industry, in order to evaluate how to strengthen financial stability. Whenever economic activities raise the same risks, they require the same regulatory response. This means that regulators should not focus on particular institutions (such as commercial banks, insurance service providers, payment service providers) but, rather, they should target market-wide behaviours and practices[228]. Therefore, the same regulation should apply regardless of whether the activities are led by an incumbent financial institution or by a FinTech newcomer.

This approach is widely adopted by regulators on both sides of the Atlantic with the goal of providing a level playing field for incumbents and newcomers[229]. From a theoretical perspective, indeed, this strategy promises to curb arbitrage opportunities and elusion from the side of market players willing to harness innovative business models and technology-enabled commercial opportunities. By focusing on the economic impact of each activity and service rather than on the entity providing it, this methodology aims to protect technology as well as business neutrality. However, the functional approach requires regulators to have strong analytic and computational skills as well as a broad understanding of the entire financial landscape, to be able to detect any potential risks. Otherwise, it

[225] This approach has been widely enacted by European regulators. See European Supervisory Authorities (2018a), 7; European Supervisory Authorities (2018b) https://eba.europa.eu/esas-warn-consumers-of-risks-in-buying-virtual-currencies, 7.

[226] Firms and financial entities are interconnected through asset and liability management: understanding the nature of these interconnections is essential for tracking the build-up of systemic risk concentrations, identifying the fault lines along which financial shocks propagate, and enhancing macro-prudential surveillance and policy making. See European Supervisory Authorities (2018a).

[227] Armour, Awrey, Davies, Enriques, Gordon, Mayer, and Payne (2016), 440.

[228] Armour, Awrey, Davies, Enriques, Gordon, Mayer, and Payne (2016), 445.

[229] See, recently, Expert Group on Regulatory Obstacles to Financial Innovation (2019), 67-68, arguing that technology-driven change may lead to a need to adapt financial regulation, in order to ensure a level playing field between incumbents and new market entrants and between different types of market participants, hence recommending the European Commission and the European Supervisory Authorities take the necessary steps to ensure that financial sector regulation follows the principle of 'same activity creating the same risks should be regulated by the same rules.'

is highly likely that any premature regulatory intervention would end up jeopardising innovation and obstructing efficiency-enhancing market developments.

A concrete example of the difficulties arising from the real world application of the functional approach is represented by the so-called "sharing economy"[230]. Despite the differences that make financial markets and platform-based free services two different industrial ecosystems, it is worth investigating this comparison to identify the weaknesses of the functional approach. In particular, Uber's impact on the taxi industry has revealed how difficult it can be to strike a satisfying balance between the need to safeguard the level playing field and the willingness to nurture innovation[231]. On the one hand, the taxi service is, worldwide, one of the most heavily regulated in terms of quality regulation, quantity regulation, market conduct regulation and price regulation[232]. On the other hand, by harnessing internet-based mobile technology to match drivers and passengers, Uber has created unprecedented competition in the sector to the detriment of incumbents. In such a case, applying to Uber the same requirements envisaged for taxi drivers and other incumbent operators following an old-fashioned functional approach would undermine competition and innovation[233]. Policy makers should instead enact new regulation able to nurture innovation throughout the market while avoiding disorderly disruption[234].

Furthermore, it may be the case that some new promising activities should be incentivised in light of the benefits they could bring to society overall, in terms of competition, innovation and consumer choice. The rigid application of a "same risk, same regulation" approach may see regulators nipping innovative services in the bud, without weighing up their potential benefits against their expected harm.

[230] For a general overview on how regulation should cope with the challenges generated by the "sharing economy", see: Cannon and Chung (2015); Katz (2015); Cohen and Zehngebot (2014).
[231] Colangelo and Maggiolino (2017).
[232] The many arguments supporting such a strong form of regulation include the need to guarantee price fairness for consumers, avoiding over-supply as well as tackling risks of congestion and pollution, along with cut-throat competition between drivers.
[233] As eloquently put by Judge Posner in Illinois Transportation Trade Association v. City of Chicago (2016 WL 5859703), "when new technologies, or new business methods, appear, a common result is the decline or even disappearance of the old. Were the old deemed to have a constitutional right to preclude the entry of the new into the markets of the old, economic progress might grind to a halt".
[234] See Colangelo and Maggiolino (2017) arguing that national regulations on transport services should be updated not with a view to stifling digital platforms such as Uber, but to enable traditional taxis to embrace new technologies. The Authors stress that "the conflict between Uber and taxis could be resolved if traditional service providers were also to embrace the same (or even better) digital solutions to better satisfy the wants and needs of consumers legally."

2.3 Regulatory experimentalism

Over recent years, new regulatory tools, known as innovation facilitators, have been designed by policy makers and regulators to address the rise of FinTech[235]. From a broad perspective, they draw on a proactive approach by public authorities towards financial services innovation. This means supervisors are not only expected to monitor market developments and to ensure that firms duly comply with the legal framework, but they are also given the additional task of overhauling the regulatory ecosystem in order to nurture innovation and competition. Rather than letting market participants struggle autonomously with a vast array of sector-specific rules, regulatory experimentation requires regulators to work side-by-side with firms in order to evaluate how to deal with FinTech-enabled products and services. More specifically, the broad concept of "innovation facilitators" includes a vast array of new regulatory instruments, namely innovation hubs, special charters, regulatory sandboxes, and mentorship regimes. Using these tools, authorities can monitor FinTech development and target supervisory and regulatory issues at an early stage[236]. By adopting a comparative perspective, this section assesses the most recent and relevant tools that have come to light across the globe.

2.3.1 Innovation hubs

One less complex experimental regulatory tool to tackle FinTech innovation consists of innovation hubs. While not particularly significant from scientific perspective, such form of regulatory action is worth considering because it signals the willingness of policy makers and supervisors to help firms developing innovative services and products. In essence, innovation hubs are dedicated points of interaction with the public authorities at which firms can seek non-binding guidance and raise queries on licensing, regulation and supervisory expectations[237]. These tools are aimed at increasing the understanding by businesses of the regulators' priorities and supervisory practices with reference to new business models, delivery mechanisms and services[238]. At the same time, they allow authorities to obtain 'real time' insights on recent trends in regulatory issues against the backdrop of rapid technological advancements (such as artificial intelligence, big data analytics, machine learning, and distributed ledger technologies).

[235] So far, the EU has taken the lead in the enactment of regulatory sandboxes. Five authorities have established operational regulatory sandboxes (Denmark, Lithuania, The Netherlands, Poland and the United Kingdom), while Norway, Austria, Estonia, Hungary and Italy have detailed preparations underway. See European Banking Authority (2019f), 16.
[236] European Banking Authority (2019d), 10.
[237] European Banking Authority (no. 53), 7, reported that innovation hubs have been established by the competent authorities in 21 EU Member States and 3 EEA States.
[238] European Banking Authority (2019f), 5.

The first innovation hubs focused on FinTech were established from 2015 by the United Kingdom's Financial Conduct Authority (UK FCA)[239], the Luxembourg Commission de Surveillance du Secteur Financier (CSSF)[240], and the Australian Securities and Investments Commission (ASIC)[241].

In the years thereafter, another 20 jurisdictions established innovation hubs devoted to FinTech innovation: Canada[242], Hong Kong[243], Germany[244], Japan[245], France[246], The Netherlands[247], Switzerland[248], South Korea[249], and the United States[250]. As for the EU, in 2019 the European Forum

[239] The FCA decided to establish the first innovation hub after careful consultations held with 83 stakeholders. The FCA Innovation Hub is charged with the task of providing undertakings with new opportunities to engage with regulators, having a dedicated contact person to deal with innovation-related queries, continuing to provide additional support for up to a year after authorisation, helping to give an understanding of the regulatory framework and of how it applies, and carrying out the ongoing programme of external engagement with innovators and other relevant entities. See Financial Conduct Authority (2014a)

[240] The CSSF established in 2015 the "Innovation, Payments, Market Infrastructures and Governance" (IPIG) department which is in charge of financial innovation, payment services, market infrastructures and general and transversal aspects relating to governance and remuneration in the financial sector and carries out the function of innovation hub. See https://www.cssf.lu/en/general-organisation/ (accessed on 25 October 2020).

[241] The innovation hub was launched in 2015 by the Australian Securities and Investments Commission (ASIC) to assist FinTech start-ups in navigating the Australian regulatory system. See https://asic.gov.au/for-business/innovation-hub (accessed on 25 October 2020).

[242] The Ontario Securities Commission (OSC) took the lead among Canadian securities firms by establishing in 2016 an innovation support unit (the OSC LaunchPad) aiming both to support innovative firms and to learn from them. See https://www.osc.gov.on.ca/en/osclaunchpad.htm (accessed on 25 October 2020).

[243] Launched on 11 November 2016, the HKMA-ASTRI FinTech Innovation Hub (The Hub) aims to be a neutral ground of the FinTech industry, a place where various stakeholders can collaborate in order to innovate. See https://www.astri.org/technologies/joint-research-laboratories/rd-centres/hkma-astri-fintech-innovation-hub/ (accessed on 25 October 2020).

[244] In Germany, the innovation hub is located at the Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht – BaFin). See https://www.bafin.de/EN/Aufsicht/FinTech/fintech_node_en.html;jsessionid=E0466EAB539A89EFE7344959A9499E6F.2_cid392 (accessed on 25 October 2020).

[245] The Japanese Financial Services Agency launched a FinTech Support Desk in December 2015. See https://www.fsa.go.jp/en/news/2018/20180717.html (accessed on 25 October 2020).

[246] The Banque de France and the French financial services regulator (Autorité de Contrôle Prudentiel et de Résolution) set up the ACPR Pole Fintech Innovation et Compétitivité division. See https://www.amf-france.org/en/news-publications/news-releases/amf-news-releases/amf-announces-creation-fintech-innovation-and-competitiveness-division-headed-franck-guiader (accessed on 25 October 2020).

[247] The Authority for the Financial Markets (AFM) and the De Nederlandsche Bank (DNB) jointly established the "Innovation Hub AFM & DNB". See https://www.dnb.nl/en/supervision/innovationhub/index.jsp (accessed on 25 October 2020).

[248] The Swiss Financial Market Supervisory Authority (FINMA) created a FinTech desk in 2016. See https://www.finma.ch/en/documentation/dossier/dossier-fintech/finanztechnologie-und-digitalisierung-2016/ (accessed on 25 October 2020).

[249] The Government established a FinTech Centre in 2015 to support the emergence of innovative financial services and the growth of the FinTech industry. See https://fintech.or.kr/web/user/enAboutFCK.do (accessed on 25 October 2020).

[250] The Office of the Comptroller of the Currency's Office of Innovation has established an Office of Innovation and has implemented a framework supporting responsible innovation. The Office serves as the central point of contact and clearing house for requests and information related to innovation. See https://www.occ.treas.gov/topics/supervision-and-examination/responsible-innovation/index-responsible-innovation.html (accessed on 25 October 2020).

for Innovation Facilitators (EFIF) was established in order to provide a platform for supervisors to meet regularly to share experiences from engaging with firms through innovation facilitators (regulatory sandboxes and innovation hubs), to share technological expertise, and to reach common agreements on the regulatory treatment of innovative products, services and business models, overall boosting bilateral and multilateral coordination[251].

As innovation hubs involve a case-by-case analysis of each brand new phenomenon, they have been praised for being more prone to promoting innovation than being mere cumbersome and complex supervisory tools, such as regulatory sandboxes[252]. By means of this institutionalised communication, regulators can keep updated on the rapidly changing FinTech business environments and are able to adjust their policies and approaches on a specific basis[253]. Moreover, from a risk-control standpoint, the supervisory authorities can request risk assessments and clarifications according to the business plans of the entities involved.

However, two major concerns may emerge. Firstly, as they require the authorities to tackle in advance complex regulatory issues involving new activities related to technological breakthroughs, it may not only be unfeasible for them to provide clear guidance, but it might also divert resources from their core supervisory tasks. This is because regulators may simply lack the expertise and skilled staff required to address these types of questions meaningfully. Secondly, as the issues underlying FinTech-enabled services are often cross-sectional, regulatory dialogue between the different authorities is likely to be necessary when it comes to innovation facilitators[254].

At the same time, the main benefit of innovation hubs (case-by-case analysis based on a bespoke model) also represents their major limitation, in terms of accuracy and scalability. As the variety and number of potential applicants willing to engage with regulators increases, it may become tricky for regulators to ensure equal treatment and well-founded evaluations. Errors from the side of the supervisory authorities might prove to be dangerous for competition and legal certainty. This would ultimately lead to sub-optimal levels of financial services provision. Alternatively, the activities carried out under the oversight of the hubs may hinder consumer welfare or the stability of the financial system, or the product may eventually trigger market reactions that differ from those envisaged by the regulators. Consequently, this may raise serious issues in terms of the liability and reputation of the supervisory authorities.

[251] European Supervisory Authorities (2017).
[252] Buckley, Arner, Veidt, and Zetzsche (2019).
[253] Arner, Barberis, and Buckley (2019).
[254] With specific reference to regulatory sandboxes, see Expert Group on Regulatory Obstacles to Financial Innovation (2019), 20. However, the critique can also be extended to innovation hubs. See European Banking Authority (2019f), 34.

Finally, given the leeway in shaping innovation facilitators overall, there is a risk of exacerbating material and interpretative divergences between regulators in different jurisdictions, thereby fuelling regulatory arbitrage[255]. In order to address this concern partially, along with the inherent cross-sectional character of FinTech, it is crucial for more regulatory entities, such as competition, prudential, financial conduct and data protection authorities, to be involved simultaneously in the implementation of innovation hubs[256]. As a result, these regulatory mechanisms would prove once more to be energy intensive for domestic regulators.

2.3.2 FinTech charters

Another experimental tool that has come to light in recent years to address FinTech innovation is represented by special licences or charters. These facilitate a proportionate strategy aimed at easing the transition from non-regulated entities to regulated entities for FinTech firms. This tool allows the scope of the regulatory perimeter, as well as the jurisdiction of supervisory authorities, to be extended by including new kinds of market players within the current regulatory regime[257].

Such a regulatory tool has already been implemented by some jurisdictions, as in the United States and Switzerland. In the US, the Office of the Comptroller of the Currency announced on 31 July 2018 that firms performing at least one core activity (taking deposits, lending money or paying cheques) would be eligible to apply for special purpose national bank charters[258]. The peculiar aspect of this licensing scheme is the clarification that the licence can also be given to firms that carry out just one of those three core activities, meaning that it is not obligatory for a FinTech-chartered entity to take deposits.

Essentially, the strategy enacted in the US attempts to augment the core authorisation regime under which any firm intending to carry out the "business of banking" must obtain a bank charter from a State bank regulatory agency or the Office of the Comptroller of the Currency[259]. While this special licence clarifies that FinTech firms are not mandated to take deposits or to comply with cumbersome

[255] Even though regulatory arbitrage is not necessarily a harmful phenomenon, when it comes to financial markets and small jurisdictions, it can be extremely perilous. Indeed, the harm caused domestically by the collapse of a financial institution can be much less significant than the harm generated externally to inter-connected close economies. See Armour, Awrey, Davies, Enriques, Gordon, Mayer, and Payne (2016), 565-566. See also Expert Group on Regulatory Obstacles to Financial Innovation (2019) 69-70, urging the importance of guaranteeing a level playing field throughout Europe with regard to the establishment or use of sandboxes, thus harmonising the sandbox system.
[256] European Banking Authority (2919f), 34.
[257] Omarova (2020); Enriques, Ringe (2020).
[258] Office of the Comptroller of the Currency (2018).
[259] United States Code, 1814 (2012), Title 12, paragraphs 21, 24, 22, 26, 27.

State level regulation (such as anti-usury laws), no attempts have been made to ease the clearing process for such firms. This can assist in explaining why, regardless of the regulatory certainty and the promise of federal pre-emption, the utility of the OCC charter still remains a matter for discussion[260]. Indeed, the first special-purpose national bank charter was granted only in July 2020[261].

In Switzerland, Parliament entrusted the Swiss Financial Market Supervisory Authority (FINMA) the power of granting a special licence with relaxed requirements in favour of innovative financial companies. Thus, since the beginning of 2019, the FinTech licence has allowed institutions to accept public deposits of up to CHF 100 million (around €93.5 million), if they are not invested and no interest is paid on them[262]. As these new players do not engage in maturity transformation (such as investing depositors' finances or lending), they benefit from relaxed requirements on capital, liquidity and organisation[263]. Similarly, anti-money laundering and governance requirements have been eased for smaller entities (maximum gross income of CHF 1.5 million) which present low-risk profiles[264]. Moreover, while such firms are not under any obligation to join the Swiss deposit guarantee scheme, they must segregate consumer deposits and ensure they are easily identifiable in their books[265]. As a result of this less stringent legal framework, the Swiss Financial Market Supervisory Authority intends to decrease the transaction costs arising from the licensing process as opposed to full banking procedures.

FinTech charters should be praised as a bold attempt to establish a clear-cut regulatory perimeter allowing firms to enjoy legal certainty and predictability, particularly in such a multi-layered institutional system as that of the US (where multiple state laws are pre-empted by federal law)[266].

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[260] Zaring (2020).

[261] Varo Money, Inc. announced, on 31 July 2020, that it had been granted its national bank charter from the Office of the Comptroller of the Currency (OCC) and had secured regulatory approvals from the FDIC and Federal Reserve to open Varo Bank, N.A. See https://www.varomoney.com/press_release/first-consumer-fintech-in-us-history-gains-full-regulatory-approval-to-become-a-national-bank/ (accessed on 29 October 2020). Google and PayPal also reportedly approached the OCC but ultimately abandoned the idea. See https://www.americanbanker.com/news/google-and-paypal-explored-occs-fintech-charter-then-walked-away (accessed on 29 October 2020).

[262] Swiss Financial Market Supervisory Authority (2019).

[263] As noted in Enriques, Ringe (2020) licensees are still subject to capital adequacy requirements in order to ensure a level of loss-absorbency for deposits, but the ratios are significantly less strict than they are for banks. See also Baker McKenzie (2019) where it is reported that Swiss FinTech licensees must maintain capital in the value of 3% of the deposits at all times and never less than CHF 300,000. This means that the initial capital required by the FinTech licensee to operate is CHF 300,000, while banks are subject to a much stricter capital requirement of at least CHF 10 million. FINMA is free to alter this requirement for individual cases and depending on the risks associated with the business.

[264] Swiss Financial Market Supervisory Authority (2018).

[265] PWC (2020).

[266] Wilmarth (2004). As pointed out in Allen (2020) federal pre-emption allows several FinTech payment firms in the US to avoid having to get "money transmitter" licences within each US state. Instead, they partner up with local banks which agree to take their clients' funds and deposits. In particular, this explains the popularity of the so-called "rent-a-charter"

However, it is worth highlighting that as special charters are still at an early stage of experimentation, there is not yet any consolidated legal framework able to support their actual predictability. Such FinTech charters could also give rise to regulatory arbitrage and unlevel playing fields if they were to generate heterogeneous legal standards for the same type of activities[267]. For instance, the OCC authority that issues special purpose charters enshrines the right to pursue the licensed activities across the United States. It should come as no surprise, then, that it has been challenged by state banking regulators which fear the competitive threat posed by a FinTech federal charter[268].

Furthermore, it should not be forgotten that charters and other kinds of special licences are inherently affected by their limited jurisdictional scope. As FinTech firms often look to harness innovative business methods at global or at least transnational scale, charters would need to be harmonised throughout different jurisdictions in order to live up to their pro-competitive promise[269]. Clearly, special licence regimes based upon case-by-case flexibility are likely to give the major jurisdictions a competitive advantage. Similarly to the OCC charter, also in the EU, a licence granted by a national competent regulator allows services to be offered and branches to be established within the European Economic Area (a potential market of 510 million consumers)[270].

Another major flaw of FinTech charters is that their practical utility depends on the willingness of regulators to embrace FinTech-enabled innovative business methods, thereby departing from existing regulatory criteria[271]. In fact, the objective of absorbing new entities and activities into the existing structure of financial sector supervision should be pursued without frustrating innovation. On the other hand, ensuring regulatory continuity by means of incremental change is not always the right approach to nurture innovation and to put it to good use for society[272]. New tailored rules, conversely, could prove to be more suited to addressing FinTech disruption.

Finally, assigning supervisory authorities the task of granting special charters and restricted licences comes with substantial liability risks for regulators in the event of a negative impact on society overall

practice among marketplace lenders, pursuant to which their bank-partners accept their clients' deposits and fund their loans before selling them on capital markets.

[267] Enriques, Ringe (2020).

[268] Omarova (2020) highlighting that in October 2019, the US District Court for the Southern District of New York ruled that the OCC had no legal authority to issue its proposed FinTech charter, a decision that was appealed by the agency. Furthermore, several states already offer specialised licences for cryptocurrency transactions and other FinTech firms offering cryptocurrency services. See Zaring (2020).

[269] See Witkowski (2019) for an insight into the US situation.

[270] Paschalidis (2012).

[271] Omarova (2020).

[272] Armour, Enriques, Ezrachi, Vella (2018).

or on consumers[273]. Therefore, it is likely that applicants will be expected to engage in strict reporting and filing activities so as to minimise the risk of evaluation errors by supervisors. Indeed, as innovation hubs are based on a case-by-case approach, firms would not be able to rely upon standardised solutions and would need to invest resources in legal assistance whenever they had to justify the special treatment of their specific application. This would, in turn, increase the entry barriers to FinTech innovative markets. Therefore, a clear trade-off emerges in the practical implementation of innovation hubs. If firms are encumbered with excessively high transaction costs, this would lead to a suboptimal level of dispensation. Conversely, if regulators adopted a lax approach towards establishing the regulatory requirements, consumers might end up bearing unacceptable losses and risks.

In view of all this, experimental approaches based on innovation hubs, special charters or no-action letters prove useful for regulators as long as they are deployed for discovery purposes. For instance, they are valuable when used to develop an understanding of innovative business methods, to identify regulatory perimeters, and to acquire knowledge of start-ups. On the other hand, given their case-by-case nature, they should not be used to tackle market-wide phenomena. Furthermore, supervisory authorities should be aware that legal certainty for business development and level playing fields could be jeopardised in the event of excessively broad deployment. To counter these drawbacks, policy makers and the most innovative supervisory authorities have put forward a new form of institutionalised experimental scheme, named regulatory sandboxes.

2.3.3 Regulatory Sandboxes

Regulatory sandboxes are operative schemes, developed and enacted by a competent authority in order to gauge the real-world functioning of innovative financial services, products or business methods[274]. The underlying goal is to benefit from a privileged point of view for firms and regulators within a monitored market space to identify more precisely the opportunities and risks generated by new commercial activities[275]. Such a scheme can be shaped depending on the features of each objective and it generally consists of a preliminary and a testing phase[276]. The former allows the

[273] As outlined in Arner, Barberis, and Buckley (2019), the risk of charters is similar to that of innovation hubs, as errors by regulators could generate suboptimal levels of dispensation, or excessive dispensation leading to unacceptable risks and consumer losses.

[274] European Banking Authority (2019f), 5.

[275] Ringe and Ruof (2020).

[276] Over the space of a few years, one of the quickest transplantations of a legal mechanism in history took place. After the UK and the EU States, Australia followed suit immediately with the Australian Securities and Investments Commission (ASIC), introducing, in 2016, a regulatory sandbox regime for FinTech products, allowing eligible

parties to agree on the technical details as well as on the regulatory burdens, which are to be temporarily eased to allow for the testing. As a result, legal costs due to the uncertainty of the implementation of laws and regulations dealing with new services are significantly reduced, thereby lowering the barriers towards FinTech innovation for firms. The latter is the core part of the regulatory sandbox as both public authorities and firms can assess the feasibility of innovative propositions in terms of market response and compliance with supervisory and regulatory principles. By doing so, firms have the opportunity to mitigate risks by developing appropriate safeguards able to avoid consumer harm[277]. Finally, the results of the testing phase, together with the feedback of the authorities involved, are made publicly available so as to disseminate far and wide the informative effect of the regulatory endeavour carried out for the benefit of businesses and society at large[278]. By doing so, regulators can better support consumer-benefiting financial innovation, improve the efficiency and competitiveness of domestic financial institutions, and foster their own understanding of new emerging technologies. Arguably, FinTech sandboxes perfectly represent a model of experimental learning strategy from the side of regulators.

Regulatory sandboxes were firstly developed and enacted by the UK Financial Conduct Authority (FCA)[279]. Under this mechanism, any firm (regardless of its financial or non-financial nature) can apply to take part in the FCA sandbox. The FCA sandbox manages to relieve individual participants from a number of operational risks. The British regulator provides tailored consultations on regulatory and legal issues arising with reference to the participating firms' business methods[280]. It was reported that the last two cohorts of sandboxes launched by the FCA received 99 applications in 2019[281] and 68 in 2020[282]. Notably, despite the global pandemic crisis, FCA applications did not plummet and instead came from firms operating both overseas and in the UK. In fact, the FCA stressed that the increased demand for digital offerings was due to the influence of the Coronavirus[283].

businesses to test particular financial services or credit activities in a less onerous regulatory environment for up to 12 months without an Australian financial services (AFS) licence or credit licence. In 2016, Singapore, Malaysia and Thailand issued regulatory rules on regulatory sandboxes. In 2018, in North East Asia, the states of Taiwan, Hong Kong and South Korea issued laws on regulatory sandboxes, immediately after Japan's financial authority had launched the 'FinTech Proof-of-Concept Hub'.

[277] For additional insights on the role of sandboxes for consumer protection, see Poncibò and Zoboli (2020).

[278] See Arner, Barberis, Buckley, and Zetzsche (2017), 101; Financial Conduct Authority (2017).

[279] See Financial Conduct Authority (2015).

[280] Allen (2020).

[281] FCA (2019), https://www.fca.org.uk/firms/regulatory-sandbox/cohort-5.

[282] FCA (2020), https://www.fca.org.uk/firms/regulatory-sandbox/regulatory-sandbox-cohort-6.

[283] The activities that were accepted into cohort 6 by the FCA include financial education platforms, digitised motor finance proposition, safekeeping and transacting of digital assets using distributed edger technology and a sustainable finance investment platform, which enables the mobilisation of capital towards green projects. Moreover, the FCA publicly stressed its willingness to "support innovators in the FinTech sector who are under pressure because of the conditions created by Coronavirus".

The applicants were looking to operate in payments and in the retail lending sector. Moreover, the FCA called, for the first time, areas in which it wanted to see more innovation[284]. More than half of the applications received by the FCA were aimed at addressing issues around access to and exclusion from financial services and vulnerable consumers, with two successful applicants developing sustainable finance models. With each admitted firm, the FCA agreed the testing parameters suitable for small-scale and short-term testing which ensured appropriate consumer safeguards.

Singapore, Switzerland, Australia and Thailand followed suit by drawing on the FCA's model. As for the EU, the European Supervisory Authorities established a Forum for Innovation Facilitators (EFIF)[285]. At its essence, it is a platform for supervisors to meet regularly to share experiences from engaging with firms through innovation facilitators (regulatory sandboxes and innovation hubs), to share technological expertise, and to reach common views on the regulatory treatment of innovative products, services and business models, boosting bilateral and multilateral coordination overall. Admittedly, within the EU legal framework, there is still room for new forms of regulatory experimentation uniformly coordinated by European institutions so to avoid competition through laxity and obstacles for the functioning of the Internal Market[286].

Against this background, the UK has managed to take a leading role in establishing the Global Financial Innovation Network (GFIN): an international group of financial regulators intending to set up a transnational sandbox strategy[287]. The GFIN launched a "global sandbox" in January 2019 aimed at providing a cross-border testing ground for FinTech products[288]. By early 2020, the GFIN had admitted eight pilot business initiatives into its programme[289].

Somewhat interestingly, on the other side of the Atlantic, the regulatory sandbox did not gain favour. As the adoption process was slow among the States, the US Treasury Department called for speedy action in the adoption phase so to catch-up with the regulatory competition taking place worldwide[290].

[284] This included propositions that 'make finance work for everyone' and 'support the UK in the move to a greener economy'.

[285] The European Forum for Innovation Facilitators was established further to the January 2019 Joint ESA report on regulatory sandboxes and innovation hubs which identified a need for action to promote greater coordination and cooperation between innovation facilitators to support the scaling up of FinTech across the single market. For further information, see European Forum for Innovation Facilitators (2019).

[286] On this point, see Ringe and Ruof (2020) praising the "institutionalised" dialogue between regulators and firms enabled by sandboxes and advocating a "guided sandbox" operated by the Member States, but in close interaction with the European Commission (through the three European Supervisory Authorities) as "monitors and guardians".

[287] The strategy was established in January 2019 and is based on coordination procedures. For further information, see the terms of reference for membership and governance of the global financial innovation network: GFIN (2019).

[288] GFIN (2019).

[289] GFIN (2019). The GFIN cross-border testing workstream has now grown from 17 regulators to a group of 23 from across five continents.

[290] US Department of the Treasury (2018).

The main obstacle to the prompt adoption of sandboxes in the United States was its fragmented system of financial surveillance, with multiple layers of federal and state regulators exercising overlapping or exclusive jurisdictional supervision in their respective areas[291]. In light of such fragmentation, the Treasury took a firm approach in favour of regulatory tools able to nurture innovation consistently[292]. Without legislative permission, supervisors are not in a position to enact effective regulatory sandboxes as they do not enjoy the power of establishing freely experimental regulatory perimeters for specific firms.

In 2018 the Consumer Financial Protection Bureau (CFPB)[293] was the first federal agency to design a FinTech sandbox[294]. The proposal envisaged two years of immunity from enforcement by any federal or state authority as well as private actions under consumer protection law. While consumer protection associations and state authorities fought this initiative as they claimed it violated the jurisdiction of federal powers, the industry heavily backed it[295].

Conversely, the Office of the Comptroller of the Currency (OCC)[296] adopted a less permissive experimentation strategy by announcing in April 2019 the Innovation Pilot Program[297]. The initiative is aimed at establishing "a consistent and transparent framework for eligible entities to engage with the OCC on pilots, which are small-scale, short-term tests to determine feasibility or consider how a large-scale activity might work in practice"[298]. Notably, only supervised entities can apply to the Program in order to overcome legal or regulatory uncertainty that could be a barrier for the development and implementation of unique or new activities[299]. Under the OCC mechanism, applicants' products are expected to fulfil at least one of the following public interest goals: promotion

[291] US Department of the Treasury (2018), 13-14.
[292] US Department of the Treasury (2018), 13.
[293] The EFPB was established in the wake of the financial crisis to provide integrated supervision of consumer protection across the financial sector.
[294] Bureau of Consumer Financial Protection (2018).
[295] Kelly (2018).
[296] The OCC is an independent branch of the US Department of the Treasury which charters, regulates, and supervises all national banks and federal savings associations as well as federal branches and agencies of foreign banks. The OCC carries out its mission by issuing banking rules and regulations and providing legal interpretations and guidance on banks' corporate decisions that govern their practices, visiting and examining the banks it oversees; evaluating applications for new bank charters or branches; for other proposed changes in the corporate structure of banks or their activities; and from foreign banks wishing to operate in the United States under an OCC charter; imposing corrective measures, when necessary, on OCC-governed banks that do not comply with laws and regulations or that otherwise engage in unsafe or unsound practices; protecting consumers by making sure banks give fair access and equal treatment to customers and comply with consumer banking laws.
[297] Office of the Comptroller of the Currency (2019).
[298] Office of the Comptroller of the Currency (2019), 2.
[299] Entities supervised by the OCC are national banks, federal savings associations, their subsidiaries, and the federal branches and agencies of foreign banking organisations. FinTech firms are not eligible to enrol in the OCC program on their own.

of financial inclusion, reduction of micro-prudential or macro-prudential risks, or meet the evolving needs of consumers, communities, and businesses. However, the Program does not exempt applicants from full compliance with federal and state laws[300]. Despite strong lobbying by financial and tech industries to incorporate explicit immunity from liability into its program, the OCC did not change the Program.

Despite the strong enthusiasm showed by many jurisdictions, the regulatory sandbox comes with several drawbacks that can diminish its effectiveness[301]. Firstly, it is inherently difficult to assess whether or not the activities meet the innovation requirement to access the sandbox. It is not always easy to establish a predictable and fair system which ensures that only truly innovative firms can benefit from the inclusion[302]. Moreover, such an evaluation requires regulators to have adequate technical and legal skills as well as resources devoted to this activity. An additional layer of complexity arises from the fact that it is almost impossible to distinguish the technological features of a FinTech product from its financial function.

Furthermore, a potential flaw of regulatory sandboxes is represented by the broad discretion involving the admission of individual firms into these experimental programmes. If not properly implemented, regulatory sandboxes can jeopardise the goal of creating a level playing field as they create two tiers between undertakings benefiting from the sandbox and those that do not. On the one hand, the greatest decision-making transparency should be guaranteed so as not to distort competition. On the other hand, the regulatory framework cannot be relaxed to the point of effectively hampering financial stability and consumer protection. Therefore, regulators must strike a balance between these two different goals. On a similar note, it is crucial for public authorities engaged in regulatory sandboxes to be transparent and straightforward in their guidance provided to firms, particularly with reference to its binding nature; otherwise, this tool is likely to end up increasing legal uncertainty and litigation if the views of regulators shift over time[303].

From a broader public policy standpoint, sandboxes promise to provide legislators and regulators with up-to-date empirical data that might be useful for improving their decision-making and enforcement initiatives. Having said that, the actual benefits that arise from this new kind of

[300] The OCC assesses the legality of any proposed activity within the context of the Program before any live test.

[301] European Banking Authority (2019f), 35-36.

[302] As highlighted by Omarova (2020), the novelty evaluation involves a deeper question of what "financial innovation" means from a public perspective. Admittedly, such an issue would complicate further the analysis as well as the risk of creating an unlevel playing field in the treatment of different players.

[303] From a comparative perspective, Tsai, Lin, and Liu (2020) point out that the implementation of regulatory sandboxes transplanted from common law jurisdictions into different domestic contexts are likely to reflect on regulatory inertia, regulatory capture, and path dependence. The Authors argue that these problems might render a country's rule of law and regulatory strategy unstable and affected by inapplicability, uncertainty, and under-implementation.

regulatory experimentalism depend on the reliability of the criteria used to assess FinTech services[304]. It is worth noting that at times sandboxes may be inherently incapable of working as an appropriate reference point for testing systemic and macro-level FinTech implications. In particular, this might be the case when the circumscribed nature of sandboxes does not allow realistic considerations to be drawn on the functioning of real-world markets.

Although it is still early to gauge the beneficial impact of regulatory sandboxes, it is worth adding a word of caution with reference to their underlying objectives. They can prove useful as long as authorities and policy makers keep in mind a clear hierarchy of priorities and regulatory goals[305]. When dealing with FinTech innovation, it should never be forgotten that financial stability and consumer protection are of paramount importance from the perspective of society.

Contrary to other markets that do not present such strong externalities, competition and innovation concerns should be carefully adjusted according to prudential considerations. Provided that this ideal is duly implemented within the design of innovation facilitators, any negative repercussions on financial stability and consumer protection can be avoided. In fact, there is nothing to prevent regulators from making use of sandboxes in order to improve their own ability of overhauling prudential policies as well as consumer protection tools[306].

To counter this risk, it is important to limit the period during which a FinTech firm is allowed to play within the sandbox (preferably by a general rule rather than on case-by-case basis, which could give rise to regulatory discrimination). Indeed, the more certain the sandbox conditions, the more likely they are to constitute a risk mitigating device, thus reducing the importance of the time limit. Time limits vary, in the first instance, from six months (Brunei, United Kingdom), to twelve months (Malaysia, Australia, Thailand), or twenty-four months (Abu Dhabi, Ontario)[307].

Last but not least, as new FinTech providers tend to compare several jurisdictions before deciding where to settle down, national regulators are likely to harness sandboxes to attract business through privileged regulatory treatment. By doing so, regulatory sandboxes could exacerbate regulatory competition between different States and endanger financial stability[308].

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[304] Omarova (2020).

[305] Allen (2020).

[306] See Financial Conduct Authority (2015), 6; Borgogno (2019), 289.

[307] For a broad overview of several regulatory sandboxes adopted throughout the different jurisdictions, see Arner, Barberis, and Buckley (2017).

[308] The European Forum for Innovation Facilitators is intended to tackle this problem by providing a platform on which supervisors can meet and regularly share technological expertise and experiences from engaging with firms, and to reach common views on the regulatory treatment of innovative products.

2.3.4 Looking ahead: the mentorship regime

The regulatory sandbox is useful for increasing the scope of the regulatory perimeter, but it comes with substantial risks involving exemptions to the ordinary legal framework which limit its application. Similarly, FinTech special licences share a common purpose with sandboxes, i.e. the relaxation of generally applicable rules, which prevent regulators from relying excessively on them.

In order to overcome such deficiencies, Professors Enriques and Ringe recently put forward the idea of introducing a "mentorship scheme"[309]. At its heart, it can be seen as a regulatory mechanism for managing the relationship between regulators, FinTech new entrants, and banks. The aim of the mentorship regime is to facilitate the entry of FinTech firms into the regulatory perimeter while avoiding the downsides of other experimental tools. On a more technical note, it allows incumbent banks to extend their own regulatory licence to FinTech players in exchange for a consideration (e.g. an equity stake, an exclusivity agreement, or a fee) so that the latter are subject to direct supervisory supervision.

Using this instrument, the bank intending to cooperate with a FinTech start-up is given the task of ensuring that the new entrant complies with all relevant laws. Thereafter, it communicates to the regulator its decision to establish a mentorship regime within a specific firm. By way of this cooperative agreement, the start-up can outsource its internal control and compliance to the bank, which is, in turn, held accountable for the FinTech's breaches and any misconduct. The incumbents must not, therefore, be too relaxed with reference to their cooperation policies.

While FinTech firms are not exempted from general rules, they are set to enjoy a double advantage. Firstly, they could rely on the incumbent's expertise as well as its human and financial resources in order to carry out all sorts of activities that are not peculiar to their innovative business method. The start-up is thereby relieved of major economic burdens in terms of transaction costs, which could otherwise hamper its market viability (such as risk management, compliance, human resources, etc.). Secondly, the scheme facilitates smoother interaction between regulators and FinTech-enabled new entrants, as the partner bank takes care of the interaction.

From a regulatory perspective, the main advantage of the mentorship regime is that the FinTech undertaking falls under the scope of supervision. This proposal aims to change the status quo significantly, as FinTech firms would cease to be exempted from regulatory supervision. Under the mentorship scheme, the competent authority could ask the bank to provide any information on the FinTech firm that it considers relevant.

[309] Enriques, Ringe (2020).

Two benefits ensue from this. Firstly, supervisory efficacy is likely to improve as it will be more consistent throughout the financial industry, also including the FinTech ecosystems. If anything goes wrong, the supervisor could intervene directly and promptly to address the issue rather than asking the bank to intervene with its FinTech partner. As the incumbent bank is severally and jointly liable in the event of any violation by the FinTech partner, the scheme ensures that adequate incentives are in place throughout the selection phase[310]. By contrast, currently, if a bank outsources some activities to a third party provider, the supervisor can only intervene on the bank and not on the third party[311].

Secondly, the supervisory authority under the mentorship regime would be expected to monitor comprehensively both the bank and its FinTech partner. However, it is clear that the supervisor would be more at ease knowing that the bank remains its main counterparty. As things stand, the incumbent has developed over the years a shared vocabulary and best practices in liaising with the authority, assisting the supervisory activity and reducing risks of mistrust and over-deterrence. This factor is crucial in areas where the supervisory authority must carry out the challenging task of weighing up new products and services against consumer welfare and financial stability, while simultaneously nurturing innovation and competition.

The mentorship regime, as presented, could work as an attractive complement to the regulatory experimentation toolbox. Such a new proposal should be praised if it manages to provide a clearer allocation of responsibilities and reinforce the effectiveness of the supervisory regime. At the same time, banks would be given a tremendous opportunity to cooperate with FinTech newcomers in a more structured and institutionalised fashion.

Having said that, it is worth pointing out that mentorship regime fails to address the competitive problems that the PSD2 is supposed to tackle as it is completely focussed on facilitating cooperation between incumbents and FinTech new comers.[312] Further, it must be acknowledged that establishing a mentorship regime in multi-layered jurisdictions (such as the United States or the European Union) may be problematic. Admittedly, when looking at the EU, a transnational mentorship regime may seem an ambitious way to enhance the Capital Market Union and the Internal Market for financial services more broadly. Nevertheless, similarly to the problems already seen with reference to other experimental tools, the current allocation of supervisory practices and responsibilities at national level

[310] The bank is expected to carry out full due diligence on its FinTech partner (implement adequate risk management processes within the FinTech, and monitor the FinTech on an ongoing basis to avoid incurring liability).

[311] Enriques, Ringe (2020).

[312] A wider analysis on the competitive dynamics between incumbents and new comers (start-up and BigTech) is provided in Section 4.11.

might make this objective quite difficult to realise[313]. By contrast, mentorship schemes could be implemented more easily in a decentralised manner at Member State level.

In this context, the European Forum for Innovation Facilitators (EFIF) could play a coordinating function as is already the case with reference to regulatory sandboxes and innovation hubs[314]. While avoiding the obstacles of engaging in exhausting and time consuming negotiation required by primary EU legislation, such interplay between national and European level would ensure consistency and smooth experimentation. The most challenging problem (which would require careful consideration by national regulators) would be represented by the accountability of banks towards regulators. Incumbents are expected to engage in extensive qualitative control before entering into a partnering agreement with a FinTech player. Accordingly, supervisory authorities could assist incumbents by drafting best practice guidelines and instructions on how to comply with documentary and due diligence obligations. As in the case of other experimental tools, mentorship schemes require regulators to engage in learning-by-doing processes to develop workable schemes.

2.3.4.1 The FinTech/incumbent cooperative environment

Interestingly, advocates of the mentorship proposal recognise that FinTech is likely to evolve as a cooperative ecosystem rather than a driver for disruption[315]. Incumbent banks might represent, in many instances, the major customers of FinTech start-ups, crucial suppliers of input and information covered by licensing requirements and distributors and conveyors of FinTech-enabled products[316].

Moreover, as incumbents are well-experienced in industry trends and developments, they may be in the best position to fund new FinTech business initiatives, thereby playing a corporate venture capitalist role[317]. Indeed, it has been reported that strategic alliances within the FinTech sector are more common than incubations, acquisitions, and joint ventures[318]. Within this environment, prone not only to competition but also to co-opetition, mentorship regimes provide a tool for facilitating such forms of partnership.

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[313] See Enriques, Ringe (2020) acknowledging that "it would probably be necessary to implement some changes in the framework to allow for Member States' individual decisions to adopt a mentorship regime".

[314] The proposal looks at the solution in Ringe, Ruof (2020) with reference to regulatory sandboxes.

[315] See Brummer and Yadav (2019) where it is noted that FinTech products could "complement or otherwise attach to the existing infrastructure. Entrant firms may wish to take advantage of the customer networks, access to capital as well as the expertise offered by incumbents with a long pedigree".

[316] European Banking Authority (2018).

[317] Brummer and Yadav (2019) note that big financial entities are already serving as incubators for FinTech talent, acquiring new FinTech-based companies and offering partnership agreements with those that develop successful evidence of their concepts and products.

[318] Drasch, Schweizer, Urbach (2018).

This form of cooperation may be advantageous for both parties. FinTech firms could put their superior technological advantage or their innovative business method to good use for incumbents by harnessing their datasets and customer access[319]. Similarly, incumbents might facilitate the market entry of FinTech players by transferring knowledge and human resources to them. On the other hand, mentorship regimes could allow incumbents to catch up with FinTech development and overcome the hurdles generated by cumbersome internal processes and legacy problems. Basically, by partnering with small scale FinTech start-ups, incumbents could harness FinTech development quickly and efficiently[320]. FinTech newcomers could then focus on customer experience and innovation-oriented activities. Last but not least, having access to incumbents' consumer base is likely to help start-ups to benefit from economies of scale at an earlier stage than would otherwise be the case[321].

Such a regulatory cooperation tool may prove to be particularly useful in those jurisdictions where legal hurdles to FinTech innovation are easily avoidable, as in the United Kingdom and the European Union. In fact, some players have already taken this route. For instance, in Germany the bank N26 has implemented a business method hinged on the broad use of application programming interfaces (APIs). As will be described in more detail in chapter 3, this platform enables third party FinTech providers to engage with online retailers, customers and other FinTech firms. By so doing, N26 benefits from an environment where third party entities enrich its customer experience and banking services. Depending on the agreement between N26 and each third party provider, such partnership can be made explicit or hidden, thereby giving the impression to customers that they are dealing only with the FinTech firm[322].

2.4 The third approach: contextualising responsive regulation

As outlined in the previous section, the rise of FinTech over the last decade has put pressure on policy makers continually to adjust their existing approaches towards licensing and supervision. By experimenting with and gauging new tools (such as innovation hubs, special charters, sandboxes) several jurisdictions have made their supervision more sophisticated and expanded their

[319] See Hunter, '*Innovation or Disruption: Not Always Black and White*' in Barberis, Arner Ross, Buckley (2019) stressing that "between financial institutions and tech companies may very well be one of the best recipes for innovation and one of the best chances for disruption".

[320] Klus, Lohwasser, Holotiuk, Moormann (2019).

[321] Klus, Lohwasser, Holotiuk, Moormann (2019).

[322] Admittedly, as noted by Enriques, Ringe (2020), if customers do not read the terms and conditions, they might have "no knowledge whatsoever of the existence of a third party bank in the relationship".

understanding of FinTech-enabled business methods. However, regulatory experimentation alone appears to be insufficient in tackling the current market development and potential[323].

More broadly, the rise of FinTech calls for regulators and policy makers to develop and adopt a new regulatory paradigm together with well-grounded guiding principles. The shape of this new regulatory philosophy is still a matter of ongoing discussion between regulators and scholars[324]. Broad consensus is emerging around the idea of "responsive regulation" or "smart regulation"[325]. As the concept is not yet widespread, it may be useful to shed some light on its meaning and its practical consequences for firms and regulators.

Admittedly, the term "smart regulation" dates back to before the 2008 financial crisis[326]. It was envisaged as a variation of the wider methodology of "New Governance" which took centre stage in academic debates during the early 2000s[327]. "Smart regulation" or "responsive regulation", in this discussion on FinTech, generally means a system of proportionate reactions to pre-identified opportunities or risks aimed at nurturing the innovative and competitive potential of FinTech[328]. According to its advocates, smart regulation builds on a market-friendly, transactional data-driven and pragmatic approach to innovation[329]. Designing rules tailored to each specific activity or product is the distinctive element of smart regulation.

While it is clear that "responsive" and "smart" should generally mean regulating in economically-sound ways, it is far more difficult to manage to achieve such proportionality in tackling any issue. On a technical note, this philosophy requires regulators to play catch-up with FinTech innovation in order to readjust continually their regulatory response[330]. Consequently, supervisory authorities should implement an open, cooperative policy based on full transparency and assistance towards FinTech firms. For instance, regulatory experimentation tools (such as sandboxes, hubs and charters) may be useful for ensuring legal certainty and smooth compliance.

One way to narrow down the problem is to remember that, under this paradigm, technological innovation is regarded as a key resource for tackling transaction costs. From this perspective, regulators are expected to identify the original features of specific market developments and to design pieces of regulation accordingly, tailored to the new technology-enabled functionalities. This

[323] Arner, Barberis, and Buckley (2017).
[324] Coglianese (2018); Fenwick, Kaal, Vermeulen (2017).
[325] Arner, Barberis, and Buckley (2017).
[326] Gunningham, Grabosky (1998).
[327] For an overview of the historical development of the New Governance concept, see Ford (2017).
[328] Coglianese (2018); Omarova (2020); Arner, Barberis, and Buckley (2017).
[329] Fenwick, Kaal, Vermeulen (2017); Arner, Barberis, and Buckley (2017).
[330] Rohr, Wright (2019).

approach builds on the consideration that a functional perspective delivers its objectives only if certain activities operate in the same way as traditional ones. However, new products and services can raise risks and concerns not falling within the umbrella of traditional regulation. Therefore, in the absence of specifically designed rules, the industry is likely to come across a twofold hurdle.

Firstly, old-fashioned regulation could hamper the socially beneficial effects of new FinTech-enabled services by retaining high barriers to entry, together with a low level of competition within the market.

Secondly, the major risks posed by FinTech players may not be adequately addressed by traditional regulation due to the inherently original character of their new services and products, thereby exacerbating the weaknesses of the financial system. In future, regulators should attempt to put FinTech to good use for society by developing new approaches and regulatory strategies able to cover the full spectrum of the concept ("new functionality, new rules"). Indeed, several national authorities have already started to strike a balance between the risks and potential benefits of FinTech by establishing new regulatory frameworks[331]. A vast array of new regulatory tools harnessing the principle of proportionality in financial regulation has emerged in recent years, from innovation hubs to piloting programmes and regulatory sandboxes[332]. At their essence, these toolkits meet the need of facilitating innovation within the financial market by requiring regulators to work side by side with firms in shaping the FinTech regulatory ecosystem.

An example of this cooperative attitude is represented the Responsible Innovation Initiative, launched in 2015 by the OCC to target the recent developments in FinTech[333]. In this way, the authority attempts continuously to learn from and act as "a central point of contact and clearing house for requests and information related to innovation"[334]. In the same vein, in July 2018 the US Consumer Financial Protection Bureau (CFPB) established the Office of Innovation, aimed at fostering "consumer-beneficial innovation"[335]. In the EU, the already mentioned European Forum for Innovation Facilitators (EFIF) could serve a similar purpose. In short, innovation hubs could provide

[331] In order to facilitate the market entry by FinTech newcomers, in 2018, the Swiss Parliament entrusted the Financial Market Supervisory Authority of Switzerland (FINMA) with the power to grant a special licence with relaxed requirements in favour of innovative financial companies. The FinTech licence allows institutions to accept public deposits of up to CHF 100 million, provided that these deposits are not invested and no interest is paid on them. See FINMA, 'Guidelines for FinTech licence applications pursuant to Article 1b of the Banking Act', (2018) https://www.finma.ch/en/~/media/finma/dokumente/dokumentencenter/myfinma/1bewilligung/fintech/w_bewillligungfintech_20181203_de.pdf?la=en (accessed on 7 March 2020).

[332] Ross Buckley, Arner, Veidt, and Zetzsche (2019).

[333] Office of the Comptroller of the Currency (2019).

[334] Office of the Comptroller of the Currency (2019).

[335] The Bureau's mission is to promote innovation, competition, and consumer access within financial services by creating policies and sandboxes through which to reduce potential barriers to innovation; engaging with stakeholders interested in promoting consumer-beneficial innovation; coordinating with Federal, State and international regulators.

the foundation for the sound implementation of smart regulation, thereby going further than their original and more limited role of assisting financial players intending to engage with innovative business methods.

In short, smart regulation is not an alternative to the *laissez-faire* strategy and the experimental approach. Regulators and policy makers should instead attempt to establish a step-by-step strategy, making use of a wide range of regulatory efforts to adjust to and accommodate tech-driven market changes. Firstly, this can be done by signalling an interest towards market players engaging with FinTech-enabled products, by establishing an innovation hub or setting up a special department within the supervisory authority. Secondly, by relying upon cautious experimentation tools (such as restricted licences, forbearance, and special charters) regulators could provide facilitated forms of financial market access. Thirdly, once clear interest is shown by the industry, it would be time for transparent, structured experimentation tools, such as regulatory sandboxes and mentorship regimes, to be used. Smart regulation, however, is not limited to such strategic usage of experimentation tools. In fact, the most advanced part of "sensitive regulation" is RegTech and pro-competitive intervention.

2.4.1 The case of RegTech

A constituent component of smart regulation enabled by financial technology is RegTech, a contraction of 'regulation' and 'technology'. This concept denotes the use of information technology (IT) in the context of reporting, compliance and monitoring implemented by a regulated entity (with or without the assistance of third party ICT providers)[336]. By automating and streamlining regulatory processes (such as compliance monitoring and data collection), this new methodology may allow for substantial savings to be achieved for both supervised entities and regulators. Since RegTech promises to give real time access to regulated firms by including cloud-based data management and artificial intelligence, it enables regulators to avoid resource intensive and time-consuming tasks.

Moreover, errors, operating inaccuracies and duplications in the data collection process are likely to be significantly reduced as a consequence of more coherent and straightforward data streams between regulated entities and supervisors. Such efficiencies may be particularly significant as a consequence

[336] Literature on the topic has been increasing since 2016. For an up-to-date overview, see Baxter (2016); Butler (2017); Enriques (2017). However, according to Arner, Barberis, Buckley (2017) "RegTech" refers to the Government's use of new technologies for regulatory and supervisory purposes, and not to the advances in private firms' use of technology for the purposes of regulatory compliance.

of the increased granularity of mandatory reporting and disclosure following the Basel III reforms of financial regulation[337].

However, RegTech not only promises to enable the synchronisation and acceleration of data collection and data analysis for supervisors but could also, if complemented by new rules explicitly designed to be machine-readable and executable, give rise to a paradigmatic shift in regulatory enforcement[338]. RegTech could turn smart regulation into a narrow techno-centric methodology[339]. In light of this, the implementation of strict forms of FinTech-enabled regulatory supervision not only concerns the capacity and effectiveness of regulators, but also its inherent philosophy.

To date, the European supervisory authorities have demonstrated openness to the idea of implementing RegTech methodologies within their daily practice. For instance, in August 2020, the European Banking Authority launched a RegTech industry survey to invite all relevant stakeholders, such as financial institutions and third party ICT providers, to share their views on and experiences with the use of RegTech solutions[340]. The aim of the survey is to gain a better understanding of the ongoing activity in this area, to raise awareness on RegTech within the regulatory and supervisory community, and to inform any relevant future policy discussion. Admittedly, the EBA is also seeking ways to facilitate the adoption and scale up of RegTech solutions across the EU whilst acknowledging and looking to address the underlying risks. According to the EBA, it is essential to ascertain the extent and impact of the use of technology-enabled innovation (RegTech) for regulatory, compliance and reporting requirements by regulated institutions[341].

It is, therefore, worth looking at RegTech from a comprehensive perspective in order to gauge its likely impact. Since the beginning of the debate, classic concerns have focused on the vulnerabilities of regulated entities and supervisory authorities to cyber attacks, along with public agencies' lack of human and financial resources to catch up with technology innovation and regulatory capture by large financial players[342].

On a broader level, however, the risks arising from a broad implementation of RegTech may not be limited to public resource management and operational issues. If it is true that RegTech is likely to

[337] For an overview of the prudential framework evolution in the aftermath of the 2008 financial crisis, see Armour et al. (2016), 384-406.
[338] Enriques (2017).
[339] Omarova (2020).
[340] EBA (2020).
[341] In its survey, the EBA focuses, in particular, on (i) mapping and understanding the existing RegTech solutions; (ii) identifying the main barriers and risks related to the use of RegTech solutions; and (iii) identifying potential ways to support the uptake of RegTech across the EU.
[342] Enriques (2017).

facilitate cheaper and quicker inspections and analyses, the overall suitability of the supervisory mechanism could suffer. It has been argued, on the other hand, that the complete automation of internal procedures and information may frustrate the ability of supervisory authorities to carry out the effective supervision of the financial system[343].

It is widely known that, particularly in the aftermath of the new wave of regulatory reforms that followed the global financial crisis, the financial supervision system relies on context-specific evaluations of individual firms' business behaviours and exposure to risks. Supervisory authorities are entrusted with relatively large discretionary power as to compliance by firms with vague and indeterminate concepts or public policy goals (such as "sound and prudent management")[344]. This requires regulators to engage in both quantitative (assessment of own funds and liquidity ratios, leverage risk, etc.) and qualitative (evaluation of corporate governance, internal procedures, etc.) assessments[345]. Substituting such a form of holistic and weighted assessment with an algorithm-based matching system of automatically gathered micro-data might undermine the nature of proportionality and contextual effectiveness of current financial regulation[346]. In turn, market players that enjoy sufficient technological and economic resources would be in an easy position to manage supervisory activities surreptitiously. At the same time, public regulators may eventually be jeopardised as they would still be required to ensure actual social policy goals even if, on paper, their power over private entities would decrease.

Furthermore, the current approach of policy makers towards FinTech innovation is pushing supervisory agencies to accommodate new business methods and innovative services. This is taking place by means of regulatory experimentalism and explicit calls to make jurisdictions more attractive for investments and new business ventures: for instance, the establishment of a national identity which would allow for transaction costs related to identity management and control, compliance, transaction monitoring, and anti-money laundering regulation to be significantly reduced[347].

Finally, standardisation is set to play a key role within RegTech and, more broadly, laying down a common standard for removing regulatory overlaps and ambiguities and for streamlining online transactions. This is a particularly significant issue for multi-layered jurisdictions, such as the United

[343] Omarova (2020).
[344] For an in-depth analysis of the principles at the basis of financial supervision, see Menand (2018); Armour, Awrey, Davies, Enriques, Gordon, Mayer, and Payne (2016), 246.
[345] For an example of this complex framework of activities, see European Central Bank (2018).
[346] Omarova (2020).
[347] Treleaven (2015).

States and the European Union. Such complex multi-state systems face challenges relating to legal harmonisation and regulatory coherency between central or federal authorities and local ones.

Against this background, it is becoming apparent that RegTech is positioned at the forefront of smart regulation[348]. Strategies aimed at adjusting the legal framework to accommodate the pro-competitive potential of technological innovation are proving to be the next frontier of sensitive regulation. This methodology encompasses normative attempts to facilitate FinTech penetration, such as providing direct access to central banking payment systems or encouraging the broad use of cloud technologies[349].

Even more prominently, the European Union took the lead in developing new legislative mechanisms tailored to recent technological developments. As will be illustrated in more detail in chapter 3, the new framework enshrined in the Payment Service Directive (PSD2) represents one of the most significant responses to the challenges posed by the FinTech industry. In short, this mechanism allows FinTech firms to connect to data systems and bank payments, providing that specific licensing requirements are met. The access-to-account rule mechanism is likely to change fundamentally the payments value chain, business profitability, and customer expectations. From a systematic perspective, such a legislative intervention is worthy of investigation as it represents the most economically impactful form of smart regulation. Rather than merely adding new elements to an existing framework, it seeks to foster competition by harnessing the potential of technological innovation.

Similarly, many other nations have introduced new rules aimed at facilitating FinTech players within the payment sector (such as Hong Kong, Australia and Indonesia[350] where providers of certain (low volume) non-cash payment facilities have been exempted from registration requirements[351]. Such interventions are not merely special chartering attempts as they also attempt to trigger a pro-competitive dynamic. The next section will now focus on this concept by looking at the remarkable example of the European Union.

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[348] Buckley, Arner, Zetzsche, Weber (2020).

[349] For instance, the Bank of England in 2017 decided to allow direct access to non-bank payment service providers by means of its Real-Time Gross Settlement (RTGS) payment system. For more details, see the press notice: https://www.bankofengland.co.uk/news/2017/july/boe-extends-direct-access-to-rtgs-accounts-to-non-bank-payment-service-providers (accessed on 9 November 2020). However, the ongoing plan to launch its own cryptocurrency, named Libra, emphasised the broader political and macroeconomic implications of opening central banks' balance sheets to emerging FinTech firms or even Big Tech firms. As stressed in Omarova (2020b) FinTech ventures could tie "financial markets to non-financial sectors of the economy in an increasingly visible and politically salient manner".

[350] Implementation of Payment Transactions Processing, Bank Indonesia Regulation no. 18/40/PBI/2016.

[351] See Chapter 3 for a comparative overview of such forms of pro-competitive regulation.

2.5 The European patchwork for a data driven RegTech strategy

The interplay between data and finance is the core element of regulatory technology. By looking at jurisdictions in which policy makers and regulators have willingly engaged with such interaction, we can establish how RegTech is evolving and can be used to support financial stability, market integrity and competition. At the same time, it provides an opportunity to analyse how regulators have addressed sometimes conflicting rules and policy objectives, such as those relating to competition and financial stability[352].

To date, the European Union has driven the implementation of RegTech in all its aspects, implementing all the different tools that have come to light in the experimentation toolbox. Furthermore, European policy makers have sought to push the boundaries of regulatory technology even further by implementing a bold system of new rules aimed at tackling some of the main issues affecting the FinTech markets (such as consumer inertia and monopolisation by incumbents). Not surprisingly, scholars and regulators around the world are now looking at the European Union as the leading player in the field[353].

This section provides an overview of the three legislative measures implemented thus far within the EU which represent the building blocks of the current RegTech European environment. The initiatives are the digital regulatory reporting requirements of, in particular, MiFID II and AIFMD, the open banking ecosystem arising from data sharing regulatory measures, and the pan-European digital identity system based on eIDAS. Even more importantly, then, such a new legal framework highlights the rise of a new frontier within the legal strategy established in relation to FinTech and, more broadly, technological innovation: the pro-competitive paradigm.

2.5.1 New digital disclosure obligations

Following the 2008 global financial crisis, European regulators overhauled the micro and macro prudential legal framework as mandated by international standard setters (such as the Basel Committee). Significant reporting duties were placed on financial entities in order to support the supervisory authorities in their challenging task of overseeing the systemic risk, competitive dynamics, money laundering and terrorist financing[354].

[352] For an in-depth analysis, from an economic perspective, of the trade-off between competition and financial stability, see Maudos and Vives (2019), Vives (2019a), Vives (2019b), Vives (2016).
[353] Buckley, Arner, Zetzsche, Weber (2020).
[354] Notably, the LIBOR scandal was one of the triggers for the major regulatory changes introduced in the aftermath of the financial crisis. See Stenfors, Lindo (2018).

The core of this regulatory intervention consists of the following pieces of legislation: the capital requirement package for the banking industry (including the Capital Requirement Regulation 575/2013[355] and Capital Requirement Directive IV 36/2013[356]), the legal money laundering directive (AMLD), the financial instruments legal framework (including the Directive MiFID II[357] and MiFIR[358]), the anti-money laundering rules (AMD Directive[359]) and the PSD2 for payment services.

All these pieces of secondary legislation involve the standardisation of international financial regulation. By imposing upon regulated entities strict reporting obligations on capital, internal governance and procedures, exposures and risks, such frameworks have laid down a sound European RegTech environment. Financial intermediaries are now used to relying upon the information technology infrastructure to ensure that their internal procedures comply with financial regulation and the data gathered are sufficient, reliable, and in the correct form. Therefore, information streams from financial intermediaries to supervisory authorities are consistent and easily manageable.

Accordingly, regulators have established data management procedures and knowledge to process and analyse such data streams[360]. Such a transition from analogical regulation to a digitalised and automated form of supervision has led scholars to hail a European RegTech "revolution".[361]. Allegedly, market players have adapted to the new rules by optimising data collection techniques, creating new business opportunities and reducing compliance costs through technological outsourcing[362]. This new methodology based on the implementation of an analytical tool to process digital data is commonly known as "datafication".

As a matter of fact, the RegTech environment hinges on the ability by regulated entities and supervisors to keep in step with data-driven innovation throughout the value chain[363]. European regulators are now able to deal with high volumes of data and to process them in good time. In turn,

[355] Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) 648/2012 [2013] OJ L 176/1.
[356] Directive (EU) 2013/36 of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC [2013] OJ L 176/338.
[357] Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU [2014] OJ L 173/349.
[358] Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012 [2014] OJ L 173/84.
[359] Directive (EU) 2018/843 of the European Parliament and of the Council of 30 May 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, and amending Directives 2009/138/EC and 2013/36/EU [2018] OJ L 156/43.
[360] Weber and Baisch (2018).
[361] Buckley, Arner, Zetzsche, Weber (2020).
[362] Notably, RegTech could provide an ideal testing ground for mentorship regimes.
[363] Weber (2017).

supervised entities are required to provide ever more refined and granular data, thereby creating a virtuous supervisory cycle[364]. The supervisory authorities now take it for granted that regulated entities benefit from an adequate and up-to-date digital infrastructure to comply with the regulatory framework[365]. The financial industry has, over the years, reached overall technological maturity which can now enable more innovative forms development and competition[366]. In short, the collection, use, storage and protection of skills can now be harnessed to embrace the potential of FinTech in terms of competition and innovation.

2.5.2 Data sharing and open banking

Against this regulatory background, the European financial industry has provided the perfect environment for enacting more ambitious forms of RegTech. It is worth looking at how, within the EU, regulators facilitated the entry of firms into the banking markets in the first place by taking a dynamic approach towards the economic hurdles that have traditionally jeopardised competition and innovation within the financial industry. Indeed, when it comes to retail consumers, the viability of many FinTech business methods relies on ready access to account data held by banks. As they enjoy a gatekeeper function in relation to transaction data, incumbents are unwilling to share these data with potential competitors, hence, some authorities and policy makers found that a market solution is unlikely to emerge by itself.

Notably, the revised European Payment Service Directive (PSD2) introduced the access-to-account rule, under which account servicing payment service providers, such as banks, must allow third parties to obtain real-time data on customers' accounts as well as provide access to such accounts by executing payment orders initiated through payment initiation service providers interfaces, on the condition that the customer has provided explicit consent and that the account is accessible online[367].

Open Banking represents a new financial ecosystem which hinges upon the development of FinTech innovation and is rooted on interoperability and data-enabled services stemming from the enhanced

[364] It is worth mentioning the case of the UK FCA enforcement proceedings against Merrill Lynch in October 2017 for failure to report some 68.5 million exchange traded derivatives transactions between 12 February 2014 and 6 February 2016 pursuant to MiFID and EMIR (the financial intermediary was fined just over GBP 34.5 million). See https://www.fca.org.uk/news/press-releases/fca-fines-merrill-lynch-failing-report-transactions (accessed on 4 November 2020).

[365] Von Solms (2020); Colaert (2018).

[366] Zepeda (2017).

[367] Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC [2015] OJ L 337/35. See Borgogno and Colangelo (2020).

power granted to customers to exploit their own transaction personal data by allowing third parties to access it[368]. Within an Open Banking environment, customers can easily perform banking activities with different providers, relying on a single online app to collect all data necessary to manage their finances, bringing together payment accounts and other products such as mortgages, pensions and investments[369].

The growth of Open Banking is aimed at transforming consumers' relationships with financial intermediaries. Indeed, Open Banking involves a new kind of business ecosystem characterised by widespread use of data-enabled services to deliver innovative and more competitive services to consumers. The EU and UK regulations share a narrow scope as they covers only payment accounts. Nonetheless, their underlying rationales and principles could be applied beyond banking, enabling consumers across markets to share their data with different providers in a secure, ongoing and standardised format[370]. Not surprisingly, the UK has already committed to assessing this approach by leading the debate on Open Finance[371]. This concept refers to the extension of third party access and open banking-like data sharing mechanisms to a wider range of financial sectors and products (such as mortgages, insurance, savings, consumer credit, pensions and investments).

2.5.3 The European digital identity: a FinTech key enabler

Identity is a crucial factor for the viability of financial systems and for open banking ecosystems to work. It protects against crime and fraud, by applying know-your-customer rules, guaranteeing confidence in and reliability of financial services[372]. At the same time, identification and know-your-customer rules can be major barriers to accessing financial services. The underlying rationale is that legal certainty on digital identification represents a key condition for the RegTech system to flourish.

It was first enshrined in MiFID 2 with Legal Entity Identifiers (LEIs) for all corporate counterparties of financial intermediaries, which ended up being the cornerstone of regulatory compliance in the EU. The second step in digital identity relates to personal identification of individuals under the GDPR, PSD2 and MiFID 2 which entered into force in 2018.

[368] Euro Banking Association (2016); Euro Banking Association (2017); UK Open Banking Working Group (2016).
[369] The topic of data sharing and open banking regulation will be dealt with in its technical aspects in chapters 3 and 4.
[370] Fingleton (2018).
[371] See Financial Conduct Authority (2019a), Financial Conduct Authority (2019b), setting up an external advisory group to drive forward the discussion about this new regulatory strategy.
[372] Arner, Zetzsche, Buckley, Barberis (2019).

The eIDAS (electronic Identification Authentication and Signature) Regulation[373] was introduced in 2014 to provide a digital identity to European companies, citizens, and government authorities[374]. The goal is to create a European internal market for eTrust Services by ensuring that eIDs work across borders and have the same legal status as traditional paper-based processes. The eIDASR lays the foundation for a service-oriented ID base. By establishing fully digital customer relationships, the European Commission aims to eliminate offline 'in office' identification as well as the need for handwritten signatures[375]. The European Commission is seeking to pinpoint new ways of identifying and authenticating customers, to facilitate remote identification and to address fraud issues.
The rationale underlying this system is to require technical interoperability of all existing national standards as well as common identification obligations (i.e. online authentication or identification by means of strictly personal data, such as fingerprints).

The Member States have been required since September 2018 to notify their national form of eID to the European Commission[376]. Once recognised, the eID allows the individual to be identified in any Member State. Depending on the level of security required for each kind of operation (for instance, submitting tax declarations or remotely opening a bank account), different technical safeguards apply.

Electronic identification is the key element for ensuring that FinTech-enabled personal services comply with GDPR and PSD2 requirements as it connects a single and discrete identity to individual personal data. Moreover, it facilitates electronic know-your-customer rules under MiFID 2, incoming post-Panama Papers requirements relating to the transparency of beneficial ownership and control of legal entities, and tax information sharing requirements under the OECD Common Reporting Standard (CRS).

The European Commission declared in 2017 that it intended to facilitate the cross-border use of electronic identification and know-your-customer portability based on eIDAS to enable banks to identify customers digitally[377]. Such functionality is set to enhance efficiency by reducing customer

[373] Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC [2014] OJ L 257/73. Prior to the adoption of the eIDASR, many different national standards of eIDs were developed within the EU Member States.
[374] See Arner, Zetzsche, Buckley, Barberis (2019) noting that by mandating liability on Member States as well as the eID provider "for meeting certain identification obligations (i.e. including that the person identification data uniquely represents the individual and online authentication is available), the eIDASR creates trust in the eIDASR-based cross-border identification."
[375] European Commission (2017).
[376] The first private sector national eID scheme notified to the European Commission was the Italian one in November 2017. See European Commission (2017m).
[377] European Commission (2017).

on-boarding costs for providers. Furthermore, financial intermediaries would be in a more comfortable position as they would be able to reject nefarious customers or fraudsters thereby discounting such cost from the products sold to average customers.

In short, it should not be forgotten that the RegTech ecosystem and any other form of advanced regulatory strategy in the digital markets relies upon the smooth functioning of electronic identity procedures (coupled with tax information sharing and Legal Entity Identifiers). Indeed, open banking environments built on data sharing between consumers and professionals, not to mention regulatory compliance, take advantage of the ability to connect various data sources (both public and private) quickly, to control financial regulatory requirements, to facilitate mass storage, and to report and verify third party providers.

There is nothing to prevent the model enacted with the eIDASR from working as an open standard, thereby going beyond the EU jurisdictions. On a technical note, any national identity system can easily connect to the European system. In fact, as it relies on nodes or connectors that provide cross-border links between other countries' systems, the eIDAS already enjoys the features necessary for a global electronic identity system to work smoothly.

2.6 The pro-competitive paradigm

Despite the enthusiasm shown by policy makers and scholars towards the ability of such experimental tools to harness the potential of FinTech, their actual impact on the industry is still largely yet to be seen[378]. Rather than being truly revolutionary, charters, sandboxes and innovation hubs appear to be seen as an appealing repackaging of the principle of proportionality traditionally applied by regulators when dealing with new business methods and services[379]. They are likely to be useful only for as long as there is a market demand for new services[380]. Furthermore, from what could be coined a legal marketing perspective, they may simply reflect the need felt by national jurisdictions to appear dynamic and open to innovation in order to attract investments and promising new businesses.

In recent years, legal marketing has arguably emerged as a key driver of regulatory activity around the world. Following the British example, several jurisdictions have opted to create innovation-

[378] For instance, as highlighted by Buckley, Arner, Veidt, and Zetzsche (n 64), the first sandbox experience in the UK covered only a tiny portion of the total number of financial services firms, a significant number of which are now either in liquidation or insolvent.

[379] European Banking Authority (n 30) 9-10.

[380] See Arner, Barberis, Buckley, and Zetzsche (n 1) 102-103, arguing that regulatory flexibility cannot act as a substitute for demand or for a sound business model.

friendly regulatory environments for businesses and start-ups. It should come as no surprise, then, that Fintech has taken centre stage for testing these new tools. Against this backdrop, it is crucially important to distinguish what is truly innovative and far-reaching from modest attempts to enrich national economies. This does not mean that innovation facilitators should be dismissed, but it must be acknowledged that they are unlikely to have a radical impact on the substance of current regulatory practices and on the evolutionary trends of the financial markets.

Conversely, as will be described in detail in the next chapters, the open banking experience is worthy of consideration as it represents a bold leap into new regulatory avenues[381]. By establishing rules of access to data with the goal of allowing new players to enter the market and by giving centre stage to regulators to oversee their implementation, the European regulators have acted as frontrunners in defining a radically new approach to FinTech. Rather than playing catch up with new market trends and the demands of technology firms, this pro-competitive paradigm calls for the establishment of a legal framework that lowers entry barriers according to the specific needs of each industrial sector. Indeed, the underlying goal of the regulatory measures enshrined in the PSD2, in the Australian intervention and in the UK Open Banking and Open Finance projects is to enable smooth data sharing between firms in order to tackle consumer inertia, thereby stimulating competition and innovation[382].

At its heart, the pro-competitive paradigm presents two key features which distinguish it in terms of originality and economic impact from old-fashioned toolkits. Firstly, under this approach, policy makers and regulators develop specific regulatory solutions to specific market problems (such as data bottleneck and consumer stickiness in the banking sector). Accordingly, market players are free to use these rules in order to develop new services, products and business methods. Secondly, regulators are given the task of overseeing the implementation of these regulatory mechanisms tailored to the needs of FinTech development. Their intervention is crucial for ensuring that incumbents or firms holding market power do not exploit these new measures merely to outsmart new entrants and supervisors. At the same time, regulators are not required to engage closely with firms to help them develop new products and services. By leaving this task to market participants, undue confusion between public authorities and businesses is avoided. As a result, this approach circumvents the risks of regulatory capture and avoids the misleading signals given to consumers and competitors by innovation facilitators.

The pro-competitive paradigm, as advanced in this work, differs from other types of regulation. Notably, the essential feature of such approach is its ex ante nature: the focus is on trying to prevent

[381] Open Banking strategies are investigated thoroughly in Chapter 2 and 3.
[382] Borgogno and Colangelo (n 20).

market failures instead of remedying them ex post. By enabling new forms of competition (for instance, through mandatory business-to-business data sharing), the pro-competitive paradigm aims at letting market dynamics to autonomously remedy competitive deficiencies that were affecting an industry before the intervention. From this perspective, such concept differs from how it was used by other scholars in the past with reference to the privatization process of public infrastructure qualifying as essential facilities (for instance, in the telecommunication market).[383] The CMA was the first public authority to use the concept of "pro-competitive regulation" according to the thesis proposed in this work in the context of the Open Banking Market Investigation Order regulation.[384]

Admittedly, pro-competitive regulation should not be regarded as a substitute for emerging experimental regulatory tools. In fact, they could complement each other perfectly, as the former is an ex ante intervention whereas the latter are forms of public counselling offered to firms on a case-by-case basis which do not alter the general legal framework. However, from a systematic perspective, the pro-competitive paradigm is better suited to addressing cross-sectional issues concerning FinTech development and, more broadly, technology-led market innovation.

Indeed, this new approach requires regulators and policy makers to work side-by-side in order to shape sector-specific regulatory instruments that can unlock competition and innovation while avoiding spill-over effects on consumer welfare and financial stability. On the contrary, innovation facilitators can only carry out a marginal task by increasing regulators' understanding of new technologies and nudging them to make full use of the proportionality principle when dealing with new services and business methods[385].

2.7 Concluding remarks

The increasing pace of FinTech development has sparked a worldwide race between policy makers to overhaul their own regulatory landscapes in order to be as innovation-friendly as possible. Consequently, a vast array of new tools and regulatory practices has emerged over recent years, threatening to disrupt traditional approaches to regulation. This gives rise to the need to establish the true potential of each allegedly new practice so as to avoid any confusion between original, far-reaching avenues of market regulation and the rebranding of old ideas prompted by legal marketing considerations.

[383] For an up-to-date overview on the role of such form of pro-competitive regulation within the telecom industry, see: Manganelli, Nicita (2020).
[384] See Section 4.5.
[385] Allen (2019).

This chapter has positioned these new tools into a systematic framework by distinguishing three different, but not mutually alternative, strategies. Firstly, the *laissez-faire* approach leaves firms free to develop and make use of FinTech breakthroughs under the ordinary regulatory framework. This strategy does not entail a passive attitude towards digital innovation in financial markets as regulators have to be watchful through continued supervision of the industry in order to target any potential risk ahead of time.

In the aftermath of the financial crisis, under the *laissez-faire* strategy, supervisors are expected to take a functional approach consistently throughout the financial market. At its core, this means enacting the same regulatory response to all economic activities raising identical risks. Despite the reasonableness of this strategy, its rigid implementation could hinder positive innovation through misleading uses of the level playing field objective.

Conversely, regulatory experimentalism requires public authorities to identify the original features of specific market developments and to design pieces of regulation accordingly, tailored to the new technology-enabled functionalities. This new approach represents a Pandora's box containing the largest part of new regulatory measures involving FinTech.

The chapter has investigated the structure and effective functioning of the two most deployed tools that have come to light thus far, namely innovation hubs, charters, regulatory sandboxes, and mentorship regimes. In particular, sandboxes are worthy of consideration as they allow for the evaluation of services and business methods with reduced risk of regulatory exposure. However, policy makers need to be aware that transparency and business neutrality are crucial for avoiding any negative repercussions on legal certainty and efficiency. On a similar note, innovation hubs should be seen as privileged points of interaction between regulators and firms aiming to overcome regulatory doubts.

However, the greatest asset of regulatory experimentation is also its biggest weakness, as the case-by-case and cross-sectional nature of these tools is extremely time consuming for sector specific regulators which find themselves carrying out complex and time-consuming preliminary work in order to provide effective answers. In practical terms, the need to ensure a level playing field for all firms engaging in the financial markets is at odds with the objective of nurturing new business methods. Overall, these innovation facilitators are corollaries of the classic principle of proportionality that has permeated into administrative activity for decades[386]. Most of the commotion

[386] On the different meanings of proportionality across common law and civil law countries, see Castro Carvalho, Hohl, Raskopf, and Ruhnau (2017).

surrounding them is due, indeed, to legal marketing considerations rather than to their truly original nature.

Building on this systematisation of current regulatory strategies, the chapter has presented "pro-competitive regulation" as a new, far-reaching paradigm that promises to unlock the competitive and innovative potential of FinTech. By drawing on the experience of the PSD2 in the EU, the chapter focused on the data access rule introduced into the financial sector in order to lower entry barriers for FinTech firms and to tackle consumer inertia. While acknowledging the need to avoid any early illusions regarding their success, as they are still under implementation, these initiatives stand out as an innovative regulatory measure specifically tailored to curb FinTech market failures in a coherent and original way.

Rather than requiring regulators to engage in mammoth tasks (such as offering general advice to market participants in the product design and implementation process), the pro-competitive paradigm focuses on ex ante regulation in order to lay down regulatory mechanisms able to open up the market to new entrants. It will be their task to make use of these tools to develop and test innovative services and business methods in the market. Against this backdrop, regulatory experimentation tools are likely to perform the more complementary (thus useful) task of helping regulators to adjust current rules according to the principle of proportionality.

Part II. Pro-Competitive regulation and data access

CHAPTER 3 - Pro-competitive regulation and financial data sharing: the case of the EU access-to-account-rule.

Short abstract of the chapter

This chapter sheds light on the evolution of the EU payment services legal framework by focusing on the access-to-account rule enshrined in the directive 2015/2366 on payment services in the internal market (PSD2)[387]. Data sharing regulatory mechanisms have the potential to strengthen and unlock competition within retail banking and payment service markets. Against this background, the access to account rule represents one of the most interesting cases of pro-competitive regulation that emerged to remedy the flaws of the essential facility doctrine. This regulatory mechanism stands out as an early sector-specific regulatory attempt to nurture competition in the digital economy and effectively implement data sharing. In the first part, a brief overview is offered of the data-enabled developments brought about by technology innovation in financial markets. The chapter focuses on the legal technicalities underlying the access-to-account rule under enshrined in the PSD2. By doing this, special attention is devoted to the interplay with data portability rights under the General Data Protection Regulation (GDPR) and how to avoid inconsistencies within European law as to financial data access. After shedding light on dynamics and interpretative challenges surrounding data sharing within retail banking markets, the chapter looks at the real world implementation of the access-to-account rule. In order to overcome the technical and competitive problems of mandated cooperation between competitors, I suggest that European policy makers should concentrate on standardization initiatives of the technical tools used to ensure data access between businesses (i.e. application programming interfaces).

3.1 Setting the scene: data-enabled innovation in financial markets

As pointed out in the first chapter, the increasing importance of technological innovation for financial services is opening a new battleground for competition in the industry. From an industrial

[387] Directive 2015/2366 on payment services in the internal market, OJ L 337/35 (2015). The chapter is based on the following articles: Borgogno, Oscar (2020) "Access to Data and Competition Policy: the Lesson of Fintech". *Annuario di diritto comparato e studi legislativi* 11: 13-39; Borgogno, Oscar and Colangelo, Giuseppe (2020) "Data, Innovation and Competition in Finance: The Case of the Access to Account Rule". *European Business Law Review* 31, no. 4: 573-610.

organization perspective, the development of FinTech can radically change the retail banking structure, which for a long time has been affected by chronic deficiencies in terms of competitive dynamics. New players providing digitally enabled financial services, big data analytics, artificial intelligence, digital identification, and distributed ledger technology are entering the arena[388]. They operate across the whole financial value chain, offering both front, middle and back-office services, as well as products for both retail and wholesale markets[389]. At the same time, traditional commercial banks and financial institution are gauging how to face this transition, whether to cooperate or compete.

European regulators and policy makers have tried to put FinTech innovation to good use for society by means of a vast array of legislative interventions. The underlying goal of such measures is to foster competition within retail banking markets through mandated forms of access to transaction data.

Retail payment markets stay at the forefront of this new strategy. Against this background, the Directive 2366/2015 on payment services in the internal market (PSD2)[390] is worth of consideration as it aims to empower consumers and businesses over their transaction data thereby strengthening their bargaining power vis-à-vis financial service providers (such as banks and credit lenders).

The provision and distribution of financial services rely strongly on data gathering and processing. Therefore, all kinds of financial services and products could be impacted as the use of big data technologies may serve various purposes, from profiling customers and identifying patterns of consumption in order to make targeted offers and personalize products and services, to support finance and risk control activities[391].

As long as data access is concerned, FinTech start-ups are set to be on the losing hand of the competitive dynamics. They need data to provide their service, but the data holders do not stand any incentive to share the information held in their digital infrastructure. This could prevent new players from entering the market for innovation in the first place. The PSD2 tried to target these competitive issues by introducing a sector-specific portability rule (the access to account rule). This regulatory mechanism aims at lowering down a key entry barrier and contributed to an equal playing field marking a crucial step towards the unbundling of retail payment markets to authorized newcomers,

[388] Chiu (2017); Athanassiou (2018).
[389] European Banking Authority (2017g).
[390] Directive (EU) 2015/2366 on payment services in the internal market [2015] OJ L 337/35.
[391] European Supervisory Authorities (2016).

which from now on will have the right to request account information without any previous agreements with banks[392].

Furthermore, as to retail financial markets, the PSD2 is supposed to lay the foundation for open banking, meant as a new business environment characterized by increased interoperability between service providers and smooth data flows enabling lively competition to the benefit of consumers[393]. Within such an ecosystem, firms and individuals can enjoy simultaneously and frictionless services and products offered by different providers. By means of a single digital interface, users could manage together payment accounts and other products like mortgages, pensions and investments[394]. Open banking hinges on a new competitive paradigm which has been increasingly embraced by policy makers around the world[395].

Such ecosystem hinges on the use of open application programming interfaces (APIs) that enable consumers to take advantage from their account data by sharing them with authorized third parties[396]. However, the implementation process of such mechanism is going to be crucial in determining the success or failure of such regulatory intervention. Even though an increasing number of policy makers around the world is encouraging API standardization initiative, there is no agreement among undertakings whether to adopt standardized, open APIs or let incumbents compete and autonomously develop their own interface to share financial data.

By building on the evolution of EU payment law, this chapter puts the sector-specific access regime enshrined in the PSD2 into a pro-competitive framework. It investigates how the access-to-account (XS2A) rule holds the potential to foster competition within retail banking markets. Furthermore, it is argued that the implementation of such regulatory initiative is crucial to ensure that FinTech data-enabled developments foster competition and mitigate information asymmetries that have traditionally hindered consumer welfare. In this respect, the chapter argues that supervised application programming interfaces (APIs) standardization is needed to deliver the necessary level of interoperability for Open Banking to flourish. From a broader perspective, the argument developed in this chapter will serve to sustain the thesis put forward in chapter 5, namely that the sector-specific

[392] See Deloitte (2018), 129; Spanish Competition Authority (2018); Ioannis Anagnostopoulos (2018), 11; Guido Ferrarini (2017), 137, considering the PSD2 as an example of regulation facilitating the disruption of traditional banking by FinTechs and promoting competition between payment services providers in Europe.
[393] European Commission (2018e), 8.
[394] UK Open Banking Working Group (2016).
[395] See e.g. Australian Competition and Consumer Commission (2020); Government of Canada (2019); UK Competition and Markets Authority (2016); Mexican Parliament Cámara de Diputados del Congreso de la Unión, Ley de Instituciones de Tecnología Financiera 9 de marzo de 2018 (Financial Technology Institutions Law) http://www.diputados.gob.mx/LeyesBiblio/pdf/LRITF_090318.pdf; Japanese Parliament, 'Banking Act', (2016) https://www.fsa.go.jp/en/news/2008/20080627-4/01.pdf.
[396] For an in-depth analysis of the function and regulation of APIs, see Chapter 3.

experience of the PSD2 may serve as a blueprint to address data sharing regulation in other sectors of the digital economy[397].

Under the taxonomy illustrated over chapter 2, the data access regime enshrined in the PSD2 shines out as a noteworthy example of responsive regulation.[398] Rather than merely overhauling the current regulatory and legislative framework around the features of early-stage FinTech markets, the European policy makers laid down the legal foundation for competition and innovation to thrive autonomously. At the same time, as it will be highlighted in the next pages, the European Commission acknowledged that the hurdle of opening up a new market based on data sharing could not be left on competition law enforcement. In light of these circumstances, the legislative experience of the PSD2 represents the natural case study to assess the potential and drawbacks of the pro-competitive regulatory paradigm.

The chapter is structured as follows. The second section focuses on the changes that took place in the European payments service regulatory arena, which stands at the forefront of the FinTech wave. The third section traces the development of EU payments law which culminated with a "regulation for competition" strategy that underpinned the XS2A rule. The section describes why the regulatory approach adopted by the EU reflects the idea that the traditional antitrust enforcement toolbox is inadequate to tackle effectively the data bottleneck problem. The fourth section stresses the key role which API standardization is called to play in different jurisdictions to ensure effective interoperability and, ultimately, the technical and commercial feasibility of open banking. The fifth section delves into the main cyber-security issues that come with the functioning of the XS2A mechanism and how they have been addressed by policy makers so far. The sixth section looks at the new gatekeeper function that banks are called to play and the strategic responses they may undertake to face the increasingly competitive landscape. The seventh section concludes.

3.2 The data bottleneck problem

[397] See European Commission (2018a), 11: "With a suitable use of application programming interfaces, this may open up for the creation of start-up ecosystems, drawing value from an unused asset and helping the host companies to create new services and products. This has been the case in the financial sector where the access to certain bank data, via the use of well-designed application programming interfaces, has opened up for a whole new ecosystem of financial services like personalised advice on daily spending patterns, all under the control and management of the financial institutions that would not, otherwise, offer such services."

[398] On this point, see the analysis of the pro-competitive paradigm in chapter 2, section 6. In brief, by setting forth rules of access to data with the goal of allowing market entry by new players and giving central stage to regulators in overseeing their implementation, European regulators acted as frontrunners in defining a radically new approach to FinTech. Rather than playing catching up with new market trends and technology firms requests, this pro-competitive paradigm mandates for laying down a legal framework that lowers entry barriers according to the specific needs of each industrial sector.

One of the main pillars of FinTech is represented by big data exploitation as well as the provision of new services based on interoperability and smooth data flows among different players[399]. Indeed, given the growth of the internet and the widespread adoption of smartphones and other personal devices, consumers are inevitably set to leave in the infosphere increasingly significant digital footprints, i.e. traces made of writing texts about oneself, uploading financial information, providing social network data, accessing or registering on websites. As a result, an increasing number of customer data are going to be leveraged by financial providers[400]. By collecting extensive information about each consumer's willingness to pay for the product and about customers' risk profiles, financial players can develop tailored services[401]. In the insurance and banking sectors, the ability to better assess the risk of granting credit to a consumer may be better understood and, accordingly, priced more accurately, leading to better credit conditions for certain customers. Due to the increasing availability of detailed data on consumers and their behavior, firms now have the possibility of refining their prices more accurately[402]. In this scenario, FinTech companies may play a significant efficiency-enhancing role by helping to overcome information asymmetries, which are at the root of the banking business.

Technological developments are expected to fundamentally change the way people and merchants access services and markets[403]. Such a development represents a double-edged sword. On the one hand, it generates substantial benefits for businesses, consumers and the overall industry. Indeed, new FinTech-enabled by-products, such as price-comparison tools and interoperability, can mitigate consumers' unwillingness and inability to switch among several firms and shop around to get the most convenient deals by developing bespoke comparison-tools and other pro-competitive applications[404]. On the other hand, as discussed in section 5, alongside opportunities FinTech innovation may raise concerns for consumers, trigger financial vulnerabilities and cause a slump in investor confidence, thus generating substantial threats to industry welfare and the payment system stability as whole.

In order to promote innovation and competition in the banking and financial landscape by paving the way for the emergence of FinTech, policymakers need to address a data bottleneck problem.

[399] Arner, Barberis, and Buckley (2016).
[400] Berg, Burg, Gombović, and Puri (2020).
[401] European Supervisory Authorities (2016), 22-24.
[402] Milanesi (2017).
[403] Zetzsche, Buckley, Arner, Barberis (2018); Accenture (2016) predicts that evolving customer preferences, advances in technology and increased competition by FinTech companies and large technology companies may cause a dramatic erosion of UK banks' payment revenues, down to 43% of current payments-based revenues by 2020.
[404] Canadian Competition Bureau (2017).

Information is a key input to compete in financial services, since the entire sector builds on information and information management[405]. Therefore, the type of information that financial institutions have and the way they use it is pivotal for the potential impact of FinTech firms[406]. As keepers of customers' finances, banks play a gateway role that is crucial to the viability of many FinTech business models.[407] Whereas newcomers need to get access to this essential information in order to steer customers towards their services, incumbents will be unwilling to share their data booty. In this respect, customers' account data can be regarded as a barrier to entry for newcomers which adds up to the traditional ones already targeted by regulators (such as capital structure requirements, the costs of funds for lending and information asymmetries between banks)[408].

3.2.1 The retail payment system in the face of financial technology

Within the financial system, payment services are set to be radically impacted by the implementation of technological breakthroughs involving distribution and design of new products. Indeed, the payments industry is a tremendous generator of valuable information, such as transaction data from which a vast array of inferences can be derived. Advanced analytics techniques can give payment providers the opportunity to have a better understanding of their customers' needs and of the status of their cash positions, to detect and monitor fraud, to assess the risk score of transactions in real-time[409].

It is thus worth paying attention to the features that this industry possesses in order to assess the ability of new regulatory schemes to strengthen innovation and ensure a workable competition within disrupted markets[410]. As is known, retail payment allows agents, such as merchants, consumers, companies and public bodies, to handle money in exchange for goods or services. For the sake of simplicity, this chapter will focus on electronic and non-cash-based payments.

[405] Robert Hauswald and Robert Marquez (2003). As noted by Liberti and Petersen (2018), it is appropriate to distinguish between soft information and hard information (information that is quantitative, easy to store and transmit in impersonal ways). The former is hard to summarize in a numeric score and requires a knowledge of its context to be wholly figured out. According to the Authors, new financial technologies are more adept at transmitting and processing hard information.
[406] Navaretti, Calzolari, Pozzolo (2017).
[407] European Commission (2011b).
[408] UK Competition and Markets Authority (2016), 126. See also Financial Conduct Authority (2018), 8, arguing that use of data will be a key determinant of how retail banking markets will evolve: since new entrants are developing digital propositions using data in ways that help consumers, for example to manage their money or to get better deals, this could encourage more consumers to interface directly with a third party in the future, rather than their bank.
[409] Deloitte (2018), 66.
[410] Hijmans van den Bergh (2018).

New service providers are entering the market by providing either innovative products or distributional channels at the so-called end-to-end end and at the front-end level[411]. More specifically, front-end providers offer account information services (AISs) and payment initiation services (PISs). The latter allows customers to initiate payment orders through an interface that interacts with the customers' accounts providers (payment initiation services providers, PISPs). The former enable users to gain an overview of their financial situation (account information service providers, AISPs). These types of providers are spreading throughout the market and include internet payment gateway providers, mobile wallets and credit card acquirers. By being involved in pre-transaction, initiation and after-transaction, they position themselves as interfaces between the customers (either payees or payers) and the account-servicing payment service provider (ASPSP), such as the banks. Apart from initiating payments on behalf of the customer, front-end providers can provide consolidated information about one or more payment accounts owned by the user to supply financial management programs as well as creditworthiness assessments, comparison tools or analyze multiple transactions carried out on the user's accounts and so on. It is clear, therefore, that all those activities need continuous and direct access both to accounts information as well as to the certainty that the accounts providers will carry out their payment orders.

End-to-end providers are closed platforms that interact both with the payer and payee arranging transactions within their system. Since payments are arranged by the provider itself, there is no need to interact with a third party providing the account except for the deposits within the platform, which take the form of an ordinary money transfer. Examples of end-to-end providers are three-party payment card schemes or e-money schemes (such as PayPal, Satispay, AfterPay and Klarna), virtual currencies, electronic money providers, and telecom providers with a payment service. These types of operator do not depend on other firms, as is the case with front-end providers, and it is therefore unlikely that they will be subject to foreclosure practices able to exclude them from the market[412]. It is nonetheless worth pointing out that end-to-end providers are set to increase the level of competition throughout the payment industry, creating a strong incentive for competitors (such as payment card scheme providers) to innovate and reduce costs[413].

In the light of their inherent dependence on account-servicing payment service providers, front-end providers are more prone than end-to-end ones to be victims of anti-competitive practices carried out

[411]European Central Bank (2010), 33. As far as competition policy is concerned, there is no need to focus on the back-end providers, a category which comprehends a wide variety of providers operating as out-sourcing providers, such as data center services, compliance, anti-money laundering and so on.
[412] Canadian Competition Bureau (2017).
[413] The Netherlands Authority for Consumers & Markets (2017), 21.

by banks and other incumbents[414]. First of all, since front-end firms need to have access to customers' accounts, any refusal by the bank would make it impossible to provide their core service, whether it be a payment order or an information analysis. Moreover, banks and incumbents have a strong incentive to foreclose front-end providers as they would take the role of direct interface with customers, thereby gaining a privileged position in the relationship with them. Accordingly, accounts providers would risk becoming a mere money depository (so-called dumb pipes), losing any front-end interaction and consequently being precluded from exploiting the consumer lock-in effect. Such a disintermediation would make it more difficult for them to sell to their customers other financial products and banking services (such as mortgages, loans, insurances).

On top of that, traditional banks and new FinTech firms would compete fiercely with regards to the provision of PISs and AISs. Conversely, end-to-end providers do not seem as dependent on banks as the former. By being a closed platform, they only need to interact with the interbank systems in order to get clearing and settlement activities (for which a special license is required)[415]. However, such a risk seems less significant than the other as it would mean that all banks in a relevant market should agree not to provide any payment accounts to end-to-end firms or restrict access to them. This explains why, therefore, it is more pressing to conceive effective mechanisms capable of ensuring that traditional players do not hamper competition by excluding front-end providers.

3.2.2 Account data as a barrier to entry: little room for antitrust law enforcement

As acknowledged by several competition authorities, regulation should welcome the FinTech phenomenon and adapt to it, given its positive impact on competition and efficiency[416]. From an antitrust perspective, the FinTech revolution has the potential to unlock competition within the retail banking sector.

An established customer base provides a legacy competitive advantage to incumbents which are substantially free to engage in bundling and tying practices to the detriment of competition and, ultimately, of consumer welfare[417].

[414] European Commission (2013c).

[415] See Article 10(1) of the Directive (EC) 2009/44 amending Directive 98/26/EC on settlement finality in payment and securities settlement systems and Directive 2002/47/EC on financial collateral arrangements as regards linked systems and credit claims [2009] OJ L 146/37.

[416] Portuguese Competition Authority (2018); Spanish Competition Authority (2018); Canadian Competition Bureau (2017); UK Competition and Markets Authority (2016).

[417] Australian Government Productivity Commission (2018); UK Competition and Markets Authority (2017); Netherlands Authority for Consumers & Markets (2014).

As keepers of customers' finances, incumbents leverage a significant information advantage represented by customers' account data. Incumbents can rent supra-competitive.[418] Consumer inertia, in this regard, represents an additional barrier to entry that allows incumbents to engage in bundling and tying practices to the detriment of competition and, ultimately, of consumer welfare[419].

3.2.3 The essential facility doctrine in the face of FinTech

Since customers' account data represent a significant barrier to entry in the banking and financial services industry, it is worth investigating whether the mentioned data bottleneck problem could be addressed by antitrust tools and provisions, rather than by a regulatory approach as the one adopted in the PSD2. Indeed, competition policy makers have long been debating the role of antitrust in facilitating data sharing in order to ensure a level playing field between undertakings.

In accordance with competition law, access to data can be obtained only in exceptional circumstances, notably those referred to in the essential facility doctrine (EFD). The EFD notion and field of application have always been controversial[420]. The EFD belongs to the framework of refusal to deal and is based on the idea that a firm which enjoys a dominant position has a duty to share its facilities with certain players asking for access, including competitors (under specific conditions).[421] While the doctrine represents an effective tool for lowering entry barriers, it affects property and freedom of contract, imposing mandatory access that limits the main right granted by the law to owners, i.e. the right to exclude others. Therefore, the discussion around the topic at issue is substantially a matter of limits. The aim of the EFD is to prevent a firm with control over an essential asset from excluding rivals, or from extending its monopoly to another stage of production. Nevertheless, it is not an easy task to show that the controlled facility is essential to competition and not only to competitors.

The impact on innovation arising from a mandatory duty to provide access needs to be carefully considered as it could significantly hinder expected returns, ultimately disincentivizing investments in research and development. When it comes to non-physical facilities, such as intellectual property rights or data control, such risk is exacerbated as it could lead the dominant firm to underinvest in innovative projects while competitors would prefer enjoying a free ride on the former's investments rather than innovating themselves.

[418] See UK Financial Conduct Authority (2016b), examining price discrimination and cross-subsidy in financial services between back-book and front-book customers.
[419] See Chapter 3 for a in depth view on the role of pro-competitive regulation and competition policy in tackling consumer inertia. See also, European Commission (2017h).
[420] For an in-depth analysis of the application of the essential facility doctrine to digital markets and potential avenues of reform, see: Graef (2016); Graef (2019).
[421] Graef (2016).

This fragile trade-off reflects the alternating fate of the EFD in the EU and US scenario. The doctrine was firstly developed by the US Supreme Court's 1912 judgment in *Terminal Railroad*[422] and was implemented in following cases[423]. Eventually the Supreme Court repudiated it in the *Trinko* decision[424]. In this landmark case the Supreme Court clearly denied the EFD, adding that, to safeguard the incentive to innovate, the possession of monopoly power is an important element of the free-market system. In this light the mere possession of monopolistic power will not be found unlawful unless it is accompanied by an element of anticompetitive conduct. According to the holding of *Aspen Skiing*, these requirements are fulfilled only when the termination of a voluntary agreement suggests a willingness to forsake short-term profits to achieve an anticompetitive end[425].

Even if *Trinko* does not deal with data related issues or intellectual property, it is interesting to assess whether the underlying principles regarding refusal to deal could be applied in FinTech data-enabled business environments. The reference is mainly to the part of the judgement where the Supreme Court recognizes that firms may acquire monopoly power by establishing an infrastructure that renders them uniquely suited to serve their customers. On the other hand, the Court states that compelling such firms to share the source of their advantage is in some tension with the purpose of antitrust law, since it may lessen the incentive to innovate for the monopolist, the rival, or both to invest in those economically beneficial facilities.[426] The Supreme Court makes it clear that courts should be very cautious in recognizing exceptions to the general rule that even monopolists may choose those with whom they wish to deal. According to the Court, compulsory licensing, if improperly designed, stifles innovation and requires antitrust courts to play a role for which they are ill-suited, i.e. to act as central planners, identifying the proper price, quantity, and other terms of dealing.

Conversely, in the last three decades the doctrine has gained huge success in the European scenario. The case law of the CJEU has defined a framework of exceptional circumstances under which a refusal to deal might involve an anti-competitive conduct. According to the leading case *Magill*, an undertaking holding an exclusive right may engage in an abusive conduct if the following conditions are met: (i) the input protected is indispensable due to the lack of actual or potential substitutes, (ii) the lack of an objective justification for a refusal to share, (iii) the possibility of the facility owner

[422] *U.S. v. Terminal Railroad Association*, 224 U.S. 383 (1912).
[423] *Hecht v. Pro-Football*, Inc 570 F.2d 982, 999 (D.C. Cir. 1977); *MCI Communications Corp. v. AT&T Co.* 708 F2d 1081 (7th Cir. 1983). Over these years, in the US the essential facility doctrine was applied mainly by lower courts, which have found the doctrine potentially applicable in a wide range of situations and precisely when controlling a bottleneck with regard to both material and immaterial assets. For instance, the case law has considered as essential, among other things, a stadium, a hospital, an electric power system, a multi-area ski ticket and the white pages of a phone directory.
[424] *Verizon Communications v. Law Offices of Curtis V. Trinko*, 540 U.S. 398 (2004).
[425] *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585 (1985).
[426] *Verizon Communications, Inc. v. Law Offices of Curtis V. Trinko* (n 424), p. 8.

reserving for itself a secondary market through its conduct and (iv) the possibility of such a refusal preventing the appearance of a new product which the intellectual property right owner does not offer and for which there is a potential consumer demand[427]. Further, in *Bronner* the CJEU clarified that the first circumstance (i.e. indispensability) involves the existence of legal, technical or economic obstacles so serious that any duplication of the facility is practically impossible or not viable[428]. Subsequent case law has gradually dismantled both the secondary market (since in *IMS* the CJEU considered the requirement to be met even if that market was just potential or hypothetical)[429] and the new product requirements (since in *Microsoft* it has been argued that this condition is also fulfilled by a follow-on innovation)[430].

According to the European Commission there is nothing to prevent competition authorities from applying the EFD in the context of data-driven markets[431]. However, the exceptional circumstances test appears inherently ill-suited to tackle consistently competitive concerns involving data-driven markets[432]. Indeed, as for the first condition, there is no agreement among scholars whether data may be considered an indispensable asset according to *Bronner*. While some contributions maintain that accessible data (i.e. open data and those which can be collected with the help of data brokers) should never be considered indispensable,[433] others stress that a vast array of obstacles may render practically impossible the replicability of specific datasets to new entrants[434].

Additional practical issues are raised by the third condition, namely the exclusion of effective competition in a secondary market requirement. This circumstance is met only when the undertaking holding the essential input is already marketing in the downstream market and, by denying access, forecloses that market to potential new entrants. Such a condition, however, is absent in many cases of refusal to share data.

Moving to the fourth requirement, i.e. the prevention of the appearance of a new product, its fulfilment in data contexts is not straightforward. Indeed, in data-driven markets firms usually do not know the products or service they are going to design by using those data before getting access to them.

[427] *RTE and ITP v. Commission*, Joint Cases C-241/91 P and 242/91 P, EU:C:1995:98.
[428] *Oscar Bronner GmbH & Co. v. Mediaprint*, Case C-7/97, EU:C:1998:569.
[429] *IMS Health GmbH & Co. OHG v. NDC Health GmbH & Co. KG*, Case C-418/01, EU:C:2004:257.
[430] *Microsoft Corp. v. Commission*, Case T-201/04, EU:T:2007:289.
[431] European Commission (2017b), 21. See, also, European Commission (2016), 12, where it declares that stakeholders stressed that a refusal to grant access to essential commercial data is the utmost problem when it comes to unfair trading practices on online platforms.
[432] Colangelo and Maggiolino (2017), 270-274.
[433] Drexl (2017); Federal Trade Commission (2014); Executive Office of the President (2016), 5.
[434] Graef (2016), 271; Grunes and Stucke (2015), 8.

Moreover, even if the EFD requirements were met, compulsory licenses regarding data would be difficult to manage for several reasons, namely the scope of the duty to share in terms of subject matter (i.e. the identification of a well-defined set of data) and time horizon, the definition of terms and conditions for the license, and the compliance with data protection law[435].

Notably, it should be defined from the outset which data are subject to the duty to share. In any case a duty to share presupposes identification of a well-defined set of resources. However, this is inapplicable to data sharing since the requesting firm cannot know *ex ante* the relevant dataset needed within the entire raw database available to the incumbent. Indeed, he must deal with a large and unknown amount of data whose content is unspecified. Therefore, the question concerns the possibility that a rival could claim the need for a certain database to produce and offer a good or a service, but he is unable to know, before access, the exact set of data of interest.

Secondly, should those data be updated in real time? The value of data lessens significantly over time; therefore, data have a limited lifespan. If they are considered so essential for competition to deserve to be shared, the requesting firm should be provided with fresh and updated data. Does this mean that there should be an ongoing, no time limit flux of data from the monopolist to those who ask for them?

Thirdly, if the focus is on the user data of digital platforms, how can these platforms be allowed to share them if they are personal data? According to data protection laws, users share their personal data as long as they clearly know the specific use the platform will make of. If, after a while, a rival of the digital platform asks for those data, how can the platform share them without violating data protection laws? Asking users to give a loose consent in favour of any digital platform's rival asking for the data would be contrary to the principles informing data protection laws[436].

Admittedly, these challenges need to be addressed also by regulation, which is not immune from the risk of distorting innovation and competition. However, by setting in advance rules generally applicable to a vast audience of players, regulation is better suited to lay down the basic requirements for avoiding systematic distortion of competition, as it will be demonstrated by looking at the PSD2 case. Finally, setting aside the above-mentioned hurdles to applying EFD, it shall be considered that the antitrust toolbox scope is limited by its inherent case-by-case approach.

[435] Colangelo and Maggiolino (2017), 274-277.
[436] Kathuria and Globocnik (2019).

As an alternative to the controversial application of the EFD, competition policy may encourage data sharing by granting a favourable (i.e. lenient) treatment to data pools,[437] in line with the one already provided to patent pools by the Technology Transfer Guidelines[438].

3.2.4 Private ordering as a solution? The case of data pools and FRAND commitments

Patent pools are private ordering tools under which firms agree to license complementary patents by means of a single agreement and at standard royalty fee. Their main object consists in lowering down transaction costs related to the so-called patent thicket problem and avoiding the tragedy of the anti-commons. In the same vein, a data pool is an agreement between different firms to license specific data sets to a central administrator in order to fully exploit its whole value by means of big data analytics. As well as for patent pools, this type of cooperation is supposed to reduce transaction costs related to data collection and data refinement activities.

The logic behind this practice is straight-forward. The very essence of big data consists of drawing valuable and original insights from data having different sources. The larger the quantity of data pooled together, the more insights, findings and accuracy of the outcomes. Thus, an increasing number of new businesses are likely to require access to large quantities of data in order to function properly. However, getting a license from each relevant data holder could be excessively time consuming and troublesome. Against this background, data pools would act as a one-stop-shop allowing entities interested in having access to those data to interact just with a single administrator.

EU Commissioner Vestager has encouraged the adoption of data pools as this practice has the potential to unlock value that could not be extracted by only focusing on single data sets[439]: "we welcome that sort of pooling of data, as long as companies do it in a way that protects people's privacy, and doesn't hurt competition."[440] According to Vestager, anticompetitive concerns can be addressed relying on the principles of the Horizontal Co-Operation Guidelines with regards to information sharing[441]. Notably, she suggests to share information anonymously: companies could send their data to a platform and get back aggregate data with no indication of which company it comes from. It would follow that data aggregation shall be prohibited under EU law just in case of reduction of price competition, hindrance to the rise of new innovative technologies or exclusionary

[437] Richter and Slowinski (2019), 22-23; Lundqvist (2018); Mattioli (2018).
[438] European Commission (2014b), paras. 244-273.
[439] Vestager (2016).
[440] Vestager (2016).
[441] European Commission (2011), paras. 55-104.

practices preventing effective access to the relevant data[442]. Similarly, restrictions on downstream competition posed on licensees are very likely to hinder innovation and, thus, would require close examination by competition authorities.

Having said that, it is worth pointing out that the conditions set forth by the Technology Transfer Guidelines with regards to the creation and operation of patent pools cannot be easily applied to data pools. According to the Guidelines, the creation and operation of a patent pool is compatible with antitrust provisions, "irrespective of the market position of the parties", if the following conditions are fulfilled: (a) participation in the pool creation process is open to all interested technology rights owners; (b) sufficient safeguards are adopted to ensure that only essential technologies are pooled; (c) sufficient safeguards are adopted to ensure that exchange of sensitive information is restricted to what is necessary for the creation and operation of the pool; (d) the pooled technologies are licensed into the pool on a non-exclusive basis; (e) the pooled technologies are licensed out to all potential licensees on FRAND terms; (f) the parties contributing technology to the pool and the licensees are free to challenge the validity and the essentiality of the pooled technologies; and (g) the parties contributing technology to the pool and the licensee remain free to develop competing products and technology[443].

In particular, the competitive risks and the efficiency enhancing potential of technology pools depend to a large extent on the relationship between the pooled technologies and their relationship with technologies outside the pool.[444] The selection and nature of the pooled assets are crucial for the antitrust assessment. Hence, in order to benefit from the safe harbor, pooling agreements must adopt sufficient safeguards to ensure that "only essential technologies (which therefore necessarily are also complements) are pooled."[445] However, when we consider data pools, it is not clear how the essentiality and the complementarity of data, within the meaning of the Technology Transfer Guidelines, can be assessed[446].

In any case, from a policy perspective, it should be noted that pooling arrangements are private ordering tools whose participation is on a voluntary base. Thus, by joining the pool, participants should be interested in sharing data in the first place. Moreover, even assuming that market players would still have an incentive to aggregate information in specific industries, an additional hurdle must

[442] European Commission (2011), para. 264.
[443] European Commission (2014b) para. 261.
[444] European Commission (2014b) para. 250.
[445] European Commission (2014b) para. 261(b).
[446] European Commission (2014b) paras. 251-252: two technologies are complements when they are both required to produce the product or carry out the process to which the technologies relate; a technology can be essential either (a) to produce a particular product or carry out a particular process to which the pooled technologies relate or (b) to produce such product or carry out such a process in accordance with a standard which includes the pooled technologies.

be circumvented in order to allow data pools entering the business practice. Data holders and licensees should agree beforehand on format, structure and other technicalities in order to ensure high level of readability of the data shared by means of the pool.

3.2.5 Between competition law enforcement and regulation

More generally, setting aside the above-mentioned hurdles to applying EFD, it shall be considered that the antitrust toolbox scope is limited by the fact that it can be invoked only to gain access to a dataset held by a dominant firm, on a case-by-case basis. Thus, regulatory interventions seem better suited to tackling data sharing core issues in a consistent way. Admittedly, it is worth noting that if the antitrust enforcer had managed to force a bank to share data with competitors under the essential facility doctrine, this would have set a precedent able to affect the behavior of other banks. Such a scenario is purely hypothetical as the European Commission, one of the most advanced competition authorities which declared on several occasions its willingness to tackle data bottleneck problems, had never tried so far to take this route[447].

This empirical evidence proves that the hurdles of applying the EFD to data-related issues in order to ensure a smooth data sharing regime across the financial industry outweighed the potential benefits. Moreover, if it is true that a successful implementation of the essential facility doctrine could have set a precedent for incumbents overall, it is unlikely that this alone could have led the industry to embrace systematically data access, which is key to put financial technology to good use for consumers. Admittedly, even if applying the requirement of indispensability in the context of transaction account data since the information related to a specific customer are not easily accessible by other service providers, the competitive data-related issues of the payment industry can hardly be solve by traditional ex-post antitrust enforcement[448]. In light of this, the evolution European payment service legislation provides a terrific case study to assess how regulation can tackle structural anti-competitive dynamics in a more effective way than traditional competition law enforcement.

Notably, as we will discussed in section 3.2, the effectiveness of data sharing regulatory interventions is linked to the technical implementation process. Notably, interoperability is a cornerstone to guarantee throughout the market that all undertakings could take advantage and leverage data access regimes. Indeed, leaving undertakings completely free to develop their own instruments to deliver

[447] European Commission (2020), 13; Communication 'A European strategy for data', COM(2020) 66 final, 13.
[448] The Netherlands Authority for Consumers & Markets (2017), 29, pointed out that "an ING customer's details are not available to ABN AMRO or Rabobank, and vice versa. This unique bank-customer relationship and the confidentiality of the information arising from it mean that, in the case of front-end providers, there is no generic market for payment accounts".

data portability raises many risks of moral hazard and exploitative conducts which could ultimately undermine the economic potential of the regulatory intervention. In this regard, competition law enforcement might play a residual role by filling the gaps which are likely to emerge from sector-specific regulations, similar to what had been proposed for other industries in the past (such as in the telecommunications sector).

3.3 Promoting competition through regulation: the evolution of EU payments law

The EU approach towards the payment industry has changed considerably over the years. Initially, between the entry into force of the Rome Treaty and the 90s, EU payments law dealt mainly with cross-border payments through soft law and negative integration[449]. It was not until the introduction of the Euro that the EU experienced a shift to public-private hybridization, federalization and ultimately maximum harmonization. Retail payment was colonized by the mingling of EU legislation and private regulation led by the European Payments Council which shaped the Single Euro Payments Area (SEPA). In the final part of this evolution, a new approach arose, known as regulation for competition, aimed at ensuring a sound competitive environment within retail payments markets, and became the new driving goal of the EU policy maker[450].

A complete and coherent governance of payment transactions was therefore conceived as the synergy between the SEPA payment system and EU legislation. The former secured, on a private ordering basis, interoperability and a clear framework of rights and obligations in the inter-bank sphere. The latter provided an early harmonization of national rules covering the bank-to-customer relationships. It does not come as a surprise, thus, that the negotiations for the SEPA Rulebooks and the preparation of the so-called "New Legislative Framework" for payments were aligned[451]. The single European payment system was developed, since its very beginning, as a hybrid public-private regulatory model[452]. On the legislative side, the Directive 2007/64/EC (Payment Service Directive – PSD) [453] represented the first comprehensive attempt to establish a clear legal framework specifying the allocation of risks among payment service providers and customers as well as the limits of transactions reversibility. In addition to the ambitious goal of regulating a vast array of payment instruments through one horizontal legal act, it is worth noting that the PSD was truly conceived as a

[449] Agnieszka Janczuk-Gorywoda (2015).
[450] Maudos and Vives (2019).
[451] European Commission (2003), 8.
[452] Janczuk-Gorywoda (2015).
[453] Directive (EC) 2007/64 on payment services in the internal market [2007] OJ L319/1.

tool to strengthen competition in the retail payment market[454]. This objective was pursued by providing harmonized market access requirements[455], and a specific single license for payment operators[456] as well as a first mechanism of access to the technical infrastructures of payment systems for payment service providers[457].

Since the entry into force of the PSD, the retail payments industry has witnessed a substantial technical innovation led by the FinTech evolution, with an exponential growth of new payment services that challenged the 2007 regulatory framework[458]. First of all, a great part of new payment front-end services or products that surfaced in recent years are not covered by the scope of PSD, making it extremely difficult to assess their rights and obligations towards both banks and customers. In particular, PISs, enabling payers to file payment orders through the online banking platform of their banks, have proved to be tremendously efficient and pro-competitive, reducing transaction costs for merchants. At the same time, account information providers started to provide customer services based on the aggregated analysis of their account information[459]. Finally, market fragmentation along Member States borders remained a serious hindrance to the Internal Market, even in the card, mobile and internet payments sectors.

Against this background, the European legislator deemed it appropriate to address all those concerns by providing a new and harmonized regulatory framework through the PSD2, which replaced the PSD and came into force on January 13, 2018. Many key changes have thereby been enacted, from the enlargement of the original scope of the PSD to the security requirements placed on undertakings with regards to risk management and reporting duties[460]. From a general perspective, the PSD2 addresses many of the regulatory and supervisory gaps of its predecessor, such as legal uncertainty arising from the interaction between incumbents and new players, the lack of consumer protection and the allocation of liabilities and risks throughout the payment chain[461]. The new Directive

[454] Mavromati (2008), 199-200 and 213-214.
[455] PSD, Recitals 10, 17, and 42.
[456] PSD, Article 10(9).
[457] PSD, Recital 16 and Article 28(1).
[458] European Commission (2011b), 7. See also PSD2, Recital 4: "Significant areas of the payments market, in particular card, internet and mobile payments, remain fragmented along national borders. Many innovative payment products or services do not fall, entirely or in large part, within the scope of [PSD]. Furthermore, the scope of [PSD] and, in particular, the elements excluded from its scope, such as certain payment-related activities, has proved in some cases to be too ambiguous, too general or simply outdated, taking into account market developments. This has resulted in legal uncertainty, potential security risks in the payment chain and a lack of consumer protection in certain areas. It has proven difficult for payment service providers to launch innovative, safe and easy-to-use digital payment services and to provide consumers and retailers with effective, convenient and secure payment methods in the Union."
[459] European Commission (2013c), 25-26.
[460] PSD2, Articles 85 and 86.
[461] European Commission (2013c), 16.

acknowledges the presence of TPPs offering PISs and AISs by bringing them (and "regardless of the business model applied by them")[462] under a comprehensive legal framework made of homogeneous standards of security, authorization and supervision requirements on an equal footing with the other payment service providers[463].

However, for the purposes of the present article, the whole array of changes introduced by the PSD2 will be set aside in order to focus attention on the impact of its provision, dealing predominantly with access and interoperability.

3.3.1 The PSD2: structure and objectives

By acting as account servicing payment service providers, banks have assumed a crucial function in the new FinTech ecosystem. Indeed, the viability of a broad range of new services is utterly dependent on the accessibility of the banking platform holding the customers' accounts. It is worth outlining that not only the possibility of transmitting payment orders or gathering in-depth account information, but even the prior information on the availability of funds on the customer's payment account are often vital for the business model of many FinTech players.

Under the PSD, banks could legitimately refuse to grant any access or to share sensitive information with TPPs due to intellectual property and security issues as well as to reputation risks and for liability reasons[464]. In the same vein, customers who shared their account security information breached their contract with the bank exposing themselves to major consequences. In the light of the potential conflict of interests among TPPs and banks, however, it would not be reasonable to give them the power of denying access to third parties. Indeed, banks have a commercial incentive to refuse any form of cooperation with third party providers, despite the willingness of their customers and even if no justified reason could be detected[465]. It goes without saying that the very existence of new integrated markets based on banking accounts services would have been seriously endangered if no clear legal frameworks were enacted. Therefore, several options had been considered by the European Commission during the early stage of the PSD2 preparatory works in order to tackle effectively potential foreclosure effects which could stifle FinTech innovation in the payments sector. A brief look at them helps in understanding the complementarity relationship between regulation and antitrust enforcement.

[462] PSD2, Recital 33.
[463] PSD2, Recitals 27-33.
[464] European Commission (2013c), 137.
[465] European Commission (2011b), 11.

The necessity to intervene on the previous legal framework had been the only choice the EU could make. Acting otherwise would have meant giving banks an excessive bargaining power with regards to new FinTech entrants. Additionally, Member States would have been free to decide whether to implement national regulation (such as in Spain and Sweden), jeopardizing the free movement of payment services[466]. Thus, to the European Commission, the so-called "no policy change" did not seem to be a viable route. According to another policy option widely supported by the banking industry, access to consumers' accounts should have been granted only with the explicit consent of the account's owner and the prior conclusion of a specific agreement between the bank and the TPP[467]. On the upside, such an option was likely to ensure a smooth integration between the service provider and the banking infrastructure, delivering a more comfortable consumer experience as well as a significantly lower litigation risk between banks and TPPs. On the downside, however, this approach raised serious competition concerns since it would have ultimately left the banks free to make unfair demands to the detriment of TPPs or, in other words, to engage in discriminatory practices. This last option, thus, has finally been set aside, as the disadvantages stemming from the commercial incentives of incumbents not to cooperate with new entrants outweighed the potential benefits of the act.

The above-mentioned options discarded, the European Commission eventually opted for an approach that would eliminate a key barrier for third parties' market access and at the same time address the concerns surrounding TPP operations[468].

3.3.2 The regulatory framework of third-party providers

By drawing on the systematic framework illustrated in chapter 2, it can be argued that the European Union decided to enact a particular form of "smart" regulatory accommodation in tandem with the chartering strategy[469]. In its very essence, the regulatory background enshrined in the PSD2 provided new tailored pro-competitive rules on data sharing coupled with specific licenses able to ensure the prudential oversight of new FinTech players.

The European legislator pursued the above-mentioned objective by widening the range of payment services covered by a special license. Account information service providers and payment initiation service providers are listed under article 4(3) n. 7 and 8 of the PSD2. Such piece of legislation follows the footsteps of the PSD by not offering a comprehensive list of features characterizing payment

[466] European Commission (2013c), 220-221.
[467] European Commission (2013c), 64 and 226.
[468] European Commission (2013c), 63-64 and 222-223.
[469] Omarova (2020).

services. Rather, it provides a list of eight categories of commercial activities referred to as payment services. Nevertheless, as long as account information services and payment initiation services are concerned, article 4(15) and 4(16) PSD2 provides for two specific definitions. Account information services are described as "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". By means of it, a FinTech player can access his own customer's payment accounts, even if provided by third parties, to gather and analyze information and offer data-enabled services. The final goal of such system is to offer the customer with a comprehensive and real time overview of his own finance in an automated way. In this way, the consumer can benefit from this analysis without the hassle of performing such operations one a time.

Similarly, payment initiation services are described 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". By providing this service, also known as payment initiation service (PIS), the provider can start a payment operation through an order received by a customer who authorized it to operate on his own account (even if this is provided by a third-party provider). Such activity consists of an online operation connecting the website of a retailer with the online banking infrastructure of the payer to execute a money transfer without resorting to card circuits[470].

Both account information services and payment initiation services are characterized by the fact that the FinTech provider needs to operate on an online account held within a third party's infrastructure (the so-called account servicing payment service providers). It should not come as a surprise that such operation can work only as long as the payment accounts are accessible online[471].

The decision to subject both AIS and PIS to a special license stems from the willingness of policy makers to ensure an effective oversight of these new FinTech-enabled services. As they allow an almost immediate execution of online payments as well as payment data analysis, they have the potential to replace in the long run cash-based transactions. It is worthy pointing out that any kind of payment service provider (such as commercial banks, FinTech payment institutions, electronic money institutions) has the opportunity to offer account information services and payment initiation services, provided they fulfill the required condition for authorization set by secondary legislation and technical regulation. Not only FinTech new players can harness the potential offered by the PSD2, but also commercial banks. These incumbents can provide AISs and PISs thereby mitigating the competitive

[470] For an in-depth competitive analysis of credit card systems, see: Borgogno, Colangelo (2019).
[471] PSD2, Article 66(1).

threat posed by third parties entry. Moreover, large merchants enjoying sufficient scale can integrate their business model by offering payment initiation services.

Pursuant to article 5 and 33 of PSD2, in order to legitimately provide their services, AISPs and PISPs need to apply beforehand for authorization with national competent prudential supervision agencies. In a more detailed manner, under articles 5(1), (5) and (6) and Article 33(1) of PSD2, the application comprehends a budget and business plan for the next three financial years, a programme of operations, a description of the applicant's internal control mechanism and governance, a description of the procedure in place to monitor, manage and follow up a security incident and security related customer complaint, a security policy document, the applicant's internal structure, details of the directors and other members of management, the address of the applicant's head office, the applicant's legal status and articles of association. Last but not least, PISPs and AISPs are required to hold a professional indemnity insurance (or an equivalent guarantee) as a condition of their authorization, the minimum monetary amount of which is to be determined by the EBA[472].

From a prudential regulation perspective, a lighter prudential regime is defined for AISPs, which are considered as payment institutions but are only subject to some of the provisions regarding transparency, information, rights and obligations[473]. Conversely, the payment initiation service providers are expected comply with some additional conditions. In particular, PISPs must contribute and maintain a minimum capital of Euro 50,000 (when the provision of no other payment services is contemplated),[474] and must provide the identity of persons with (direct or indirect) qualifying holdings in the applicant (including description of the size of such holdings and evidence of their suitability)[475].

Furthermore, the European Banking Authority is entrusted with the task of developing, operating, and maintaining a publicly available electronic central ledger gathering all the information collected within national public registers of each member state as notified by the competent authorities. By way of this, it would be easily possibly for firms and consumers to verify the payment services for which each FinTech or incumbent is registered and authorized[476]. Provided the national competent authority of the home Member State has granted the authorization, the PISPs and AISPs at stake enjoy a European passport to operate freely throughout the European Union and the European Economic Area through a streamlined passporting process[477].

[472] PSD2, Article 7(b).
[473] PSD2, Article 33.
[474] PSD2, Article 7(b).
[475] PSD2, Article 5(1)(m).
[476] PSD2, Article 15.
[477] PSD2, Article 28 and Article 29.

3.3.3 The access to account rule

Pursuant to the access to account rule (XS2A), account servicing payment service providers, such as banks, shall allow third parties to obtain real-time data relating to customers' accounts as well as provide access to such accounts by executing payment orders initiated through PISPs interfaces, on condition that the customer gave his explicit consent and that the account is accessible online[478]. It is worth highlighting that even incumbent banks themselves are free to provide PIS and AIS thereby fully exploiting the competitive potential of the XS2A to attract new customers.

Furthermore, banks are under obligation to grant such access on a non-discriminatory basis both to PISPs[479] and to AISPs[480]. More specifically, any ASPSP shall treat and execute all the payment orders transmitted via a third-party's interface as if they were sent directly by the customer through the banking infrastructure, without any discrimination in terms of charges vis-à-vis made by the user firsthand, timing and priority[481]. Nevertheless, it is still unclear whether banks can charge a fee in exchange for the access granted to front-end third-party providers. In fact, the direct payment service provided to accounts' users is not free, but, instead, it can be considered as a part of the fixed amount regularly charged by the bank[482]. It could theoretically be possible that such compulsory access can be compensated, as it happens, *mutatis mutandis*, with standard essential patents that are licensed under fair, reasonable and non-discriminatory (FRAND) terms[483]. Furthermore, in order to avoid that potential disputes between users and payment providers could hinder the functioning of the XS2A rule, the PSD2 mandates Member States to put in place an effective system of alternative dispute resolution[484].

At the same time, AISPs and PISPs need to be registered according to the Member States procedural system in order to carry out their activities, complying with the requirements laid down by the European Banking Authority (EBA) [485]. Moreover, it has been made clear that AISPs and PISPs are subject to less troublesome prudential requirements than banks because they do not hold client funds[486].

[478] PSD2, Articles 64-68.
[479] PSD2, Article 66(4)(c).
[480] PSD2, Article 67(3)(b).
[481] PSD2, Articles 66(4)(c) and 67(3)(b).
[482] The Netherlands Authority for Consumers & Markets (2017), 35.
[483] European Commission, *FinTech Action plan* (2018e), 7: for standards to be pro-competitive, participation should be unrestricted, the procedure for adopting the standard should be transparent, allowing stakeholders to effectively inform themselves of standardization work, and effective access to the standard should be provided on FRAND terms.
[484] PSD2, Articles 101-103.
[485] European Banking Authority (2017h), 5-11.
[486] PSD2, Recitals 34 and 35.

In addition, PISPs are explicitly precluded from using, storing and accessing any sensitive data which are not relevant to the payment transaction requested by the user[487].

With regards to security, the PSD2 mandates that users' credentials must not be shared with any party other than the user himself and the bank.[488] The only subject allowed to obtain any information about the payment user is the payee, upon the former's consent[489]. Lastly and more importantly for the purposes of the following section, TPPs are required to identify themselves every time a payment order is transmitted or access to account data is sought. Accordingly, any form of communication between the bank and third party shall take place in a secure way[490]. As shown in the following section, the EBA has been mandated to develop five sets of guidelines and six drafts of Regulatory Technical Standards (RTS) that payment providers need to comply with in order to ensure high levels of security as well as a successful functioning of the access to account rule[491].

3.3.4 Addressing consent under PSD2 and GDPR

Within EU law, the interplay between the PSD2 and the GDPR pose significant legal challenges as they both deal with the consent needed to provide data access to third parties. While the PSD2 is aimed to foster innovation and competition in the internal market, the General Data Protection Regulation 2016/679 (GDPR) purports to shield all EU citizens from privacy violation and data breaches in an increasingly data-driven business eco-system. Since these different regimes overlap in terms of customer's consent to the processing of personal data and strong requirements for data protection, it is worth shedding some light on how they could interact. The issue, if not properly addressed, is likely to generate legal uncertainties and disputes between payment service providers expected to comply with the GDPR, while simultaneously being ordered to share personal data in accordance with PSD2.

As already described in the previous pages, according to the access to account rule, banks are under the obligation to provide account data access to service providers who obtained the previous consent by the account holder. Such consent shall be collected in any form and through any course of action agreed between the account owner and the provider. When the user has given consent for the data access or the initiation of a payment to be executed, it cannot be withdrawn freely. To ensure legal

[487] PSD2, Articles 65(3) and 66(3)(e-f).
[488] PSD2, Article 66(3)(b).
[489] PSD2, Articles 63(3)(d) and 98(1)(d).
[490] PSD2, Article 66(4)(a), and Article 98(1)(d).
[491] PSD2, Article 96(3) and (4).

certainty and predictability, only within a particular time frame and under specific conditions the user is entitled to withdraw it[492].

With the customer's consent under PSD2, third-party providers can request and receive from banks, access to their customers' payment accounts 'on an objective, non-discriminatory and proportionate basis.' The access should be sufficient to enable third-party providers to provide payment services in an efficient manner. The scope of access is limited to what is strictly necessary to offer the payment service requested by the user of the payment service.

When banks receive an access request from third-party providers, consented to by the customer, banks are allowed to deny it only for appropriate reasons, which should be disclosed in due time to the competent supervisory agency. As a matter of fact, the reasons for refusing the access request must be duly justified and duly evidenced. Furthermore, they are legitimate only if relating to "unauthorized or fraudulent access to the payment account by that account information service provider or that payment initiation service provider, including the unauthorized or fraudulent initiation of a payment transaction" [493].

In contrast, PSD2 does not mention the need for banks to obtain the consent of customers before providing third-party providers with access to customer payment accounts through banks' application programming interfaces (APIs). However, third-party providers must have customer consent in place to ensure that their access to bank account information and payments made on their customers' behalf are fully compliant. Once consent is in place, consumers can exercise the account information or payment initiation service of the third-party provider. The third-party provider can then process the information request to the relevant bank to see whether consent has been granted. The bank's role is to verify whether the customer's proper and legitimate consent has been obtained by the third-party provider.

Third party providers are expected to ensure high levels of security and full compliance with data protection law.[494] Pursuant to article 94(2) payment these firms are allowed to obtain, analyse, and

[492] Pursuant to PSD2, Article 109(1) the specific cases under which a withdrawal of authorisation is appropriate are provided for by national competent supervisory authorities.
[493] PSD2, Article 68(5).
[494] PSD2, Article 94. Account data is personal data according to the Article 4 of the General Data Protection Regulation ("GDPR", Regulation 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, OJ L119/1 (2016)) broad definition ('any information relating to an identified or identifiable natural person'), so it is necessary to clarify how the two regimes should be coordinated. Indeed, Article 20 of the GDPR has introduced a new right to data portability, according to which each person has the right to have returned to them personal data they have provided to a company or organization on the basis of consent or contract and has the right to have that data transmitted without hindrance from one controller to another (even directly where technically feasible). Thus, with regards to accounts data, when customers ask for their data to be portable, they will need to make a

retain personal data of customers as long as it is necessary for the provision of their services and the "explicit consent" of users at stake is in place. The European Data Protection Board ("EDPB") recently pointed out in its Guidelines 06/2020 that such consent shall be freely given, meaning the customer cannot be forced to provide the consent and should remain in the position to withdraw it during the on-going contractual relationship.

At the same time, one needs to consider that account data is personal data according to the Article 4 of the General Data Protection Regulation[495] ("GDPR") broad definition ('any information relating to an identified or identifiable natural person'). This raises the question of whether Article 94(2) of PSD2 is *lex specialis*, thereby prevailing over the GDPR. In this case, the legal basis for processing personal data by payment service providers would be explicit consent in accordance with PSD2, rather than any other legal grounds for processing provided for under the GDPR.

Thus, it is necessary to clarify how the two regimes should be coordinated. GDPR sets a comprehensive and sound protection framework designed to be applicable throughout the European Union. The legal basis for processing data are provided under article 6 of GDPR. Under this provision, data controllers (such as banks, third-party FinTech providers, and financial institutions) can process a data subject's data only with a legal basis. There are six potential lawful grounds for processing data: (a) processing under the data subject's consent, (b) processing necessary for contractual obligations, (c) processing necessary under statutory obligations, (d) processing necessary for the protection of the vital interests of the data subject, (e) processing necessary for a task performed in the public interest, and (f) processing necessary in the legitimate interests of the controller.

Clearly, consent is just one potential legal basis for processing. The consent of the data subject shall be understood as "any freely given, specific, informed and unambiguous indication of his or her wishes by which the data subject, either by a statement or by a clear affirmative action, signifies agreement to personal data relating to them being processed."[496]

As consent must be freely given, the data subject (i.e. the customer) can withdraw consent at any time without a specific reason[497]. In light of this, scholars and practitioners have started wondering how to

choice between which regimes they intend to opt for (PSD2 or GDPR). In this respect, as clarified by the Article 29 Data Protection Working Party (2017), 8, footnote 15, since the access rule envisaged in the PSD2 is a sector-specific regime, the potential option exercised by the customer overrides the application of the general data portability principle established in the GDPR.

[495] Regulation 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, OJ L119/1 (2016).

[496] GDPR, Article 6.

[497] Admittedly, this provision comes with some exceptions. For instance, when processing the information of a minor, consent must be given by the parent or the person with legal authority over the child.

comply with consent rules under both GDPR relate to PSD2[498]. As established in recital 87 of PSD2, the Directive 'should concern only contractual obligations and responsibilities between the payment service user and the payment service provider'. Therefore, it could be argued that this amounts to a legitimate legal basis for processing under article 6(1)(b) of GDPR, namely when it is necessary for the performance of a contract to which the data subject is party.

Nevertheless, as pointed out within the EDPB Guidelines 2/2019, this line of reasoning cannot work when it is not possible to show that the processing of the personal payment account data is objectively necessary for the provision of each of these services separately[499]. In these cases, the controller should consider another legal basis for processing.

The customer's consent could play a major part, with approval being mentioned in both PSD2 (as a prerequisite for providing payment services) and GDPR (as one of the legal grounds permitting the processing of personal information). However, these two forms of consent are not strictly aligned. While under the GDPR data subjects cannot be prevented from withdrawing their consent when they want, this could disrupt the access mechanisms under the PSD2.

Therefore, the EDPB addressed the issue after the entry into force of PSD2 by defining "explicit consent" as a contractual consent whereby payment services are always provided in a contractual manner between the payment service user (i.e. the customer) and the payment service provider[500]. From a general perspective, this is in line with the goals of PSD2, which focuses only contractual obligations and liabilities between the payment service provider and payment service user. However, it is worth highlighting that the concept of payment service user 'consent' as referred to in PSD2 is different from the concept of data subject 'consent' under GDPR[501]. There is an apparent conflict concerning data sharing under PSD2 and obtaining consent to share such data under GDPR. Under this piece of legislation, financial institutions cannot process customer data without consent or one of the lawful grounds provided in article 6 of GDPR. Pursuant to PSD2, payment service providers must have obtained customer's consent to access the customer's bank account[502]. Explicit consent is, therefore, required to provide services to customers, but is not clearly described in PSD2 so to replace the GDPR provision.

The EDPB clarified that customers signing a contract for payment services must be duly informed of the purposes for which their data is processed and provide an explicit consent to those objectives. In

[498] Helgadottir (2020); Borgogno and Poncibò (2019).
[499] European Data Protection Board (2019).
[500] European Data Protection Board (2018).
[501] Helgadottir (2020).
[502] PSD2, Article 66-67.

case this data should be processed for purposes other than the one set in the contract, the EDPB suggested that consent could be provided under the other legal grounds listed in the GDPR[503]. Thus, explicit consent under PSD2 is an additional requirement of a contractual nature. Payment services are always provided on a contractual basis between the payment service user (ie the customer) and the payment services provider. Therefore, as stated by the EDPB in 2020, when a payment service provider needs access to personal data for the provision of a payment service, explicit consent in line with Article 94 of PSD2 of the payment service user is needed[504].

Arguably, PSD2 cannot be considered as *lex specialis* with reference to GDPR. This is because PSD2 does not provide a specific definition of explicit consent able to replace the one enshrined in the GDPR. It is therefore clear that payment service providers, under EU law, are expected to comply with one of the lawful bases available under the GDPR for processing personal data and to fulfil the explicit consent requirement rules under PSD2.

Furthermore, article 20 of the GDPR has introduced a new right to data portability, according to which each person has the right to have returned to them personal data they have provided to a company or organization on the basis of consent or contract and has the right to have that data transmitted without hindrance from one controller to another (even directly where technically feasible). Thus, with regards to accounts data, when customers ask for their data to be portable, they will need to make a choice between which regimes they intend to opt for (PSD2 or GDPR). In this respect, as clarified by the Article 29 Data Protection Working Party in 2017, since the access rule envisaged in the PSD2 is a sector-specific regime, the potential option exercised by the customer overrides the application of the general data portability principle established in the GDPR[505].

3.3.5 The Regulatory Technical Standards saga: bargaining around competition and data security

As acknowledged by the European Commission, since the production and delivery of financial services requires different operators to cooperate and interact, an EU-wide FinTech market will not reach its full potential without the development of open standards that increase competition, enhance interoperability and simplify the exchange of and access to data between market players[506].

[503] Provided all the conditions enshrined in Article 7 and Article 4(11) of GDPR are fulfilled.
[504] European Data Protection Board (2020).
[505] Article 29 Data Protection Working Party (2017), 8, footnote 15.
[506] European Commission (2018e), 7. See also Portuguese Competition Authority (2018), 23.

Accordingly, the success or the failure of the XS2A rule as a key to unlock competition within retail banking markets is mainly dependent on the way the industry will implement its technicalities[507].

Before the changes enacted by the PSD2, TTPs had relied on so-called "screen-scraping" to access customers' accounts. Such mechanism can be defined as the automated, programmatic use of software via which the customer allows a third party (such as a FinTech) to extract data or perform actions that users would usually perform manually on the website, by sharing with the latter their security credentials. Several existing AISPs, PISPs and ASPSPs (when providing AIS and/or PIS) were accustomed to accessing a large range of data using screen-scraping. Such unregulated form of access to accounts and consumer digital data gave rise to a vast array of frauds and threats to personal data security[508].

In order to avoid the drawbacks related to screen-scraping, the PSD2 states that the implementation of the XS2A rule must follow specific procedures and technical requirements drafted through a commonly known "Level 2 legislative process"[509]. According to this provision, the EBA has been charged with the task of developing five sets of guidelines and six drafts of RTS. Such measures are crucial to ensure a workable interoperability and implementation of the XS2A rule as well as the security of account data transfers.

The initial draft of the RTS published in 2017 raised concerns among FinTech players since it established that the only way to access a customer's data was through a dedicated interface provided by the bank. According to critics, such a system would have allowed banks to interfere surreptitiously in the data transfer process, thus hampering the commercial potential of FinTech companies. As a response, in 2017 the European Commission published an amended version of the EBA's draft RTS and set up a mechanism of direct access to customers' accounts in case of deficiencies of the dedicated interfaces provided by the bank[510]. In this way, a guaranteed form of communication was ensured in order to avoid the risk of foreclosure of FinTech providers. The draft was further amended following the comments drawn up by the EBA against the fallback remedy: national authorities, upon express reassurance with regards to the functioning of the interface, can exempt incumbents from the contingent direct access mechanism. Moreover, representatives of TPPs would have the opportunity to check the reliability of the banking interfaces and review their quality before any exception was granted. At the end of this complex process of intense debate between the European Commission, the

[507] Vezzoso (2018), 9.

[508] European Banking Authority (2017i). See also Zernik (2020); Zunzunegui (2018).

[509] PSD2, Article 98. See also European Banking Authority (2017c).

[510] European Commission (2017e).

European Parliament and the European Council, the final version of the RTS was released by the European Commission in March 2018[511]. Even if these measures entered into force in September 2019,[512] the EBA accepted that national regulators may give some operators extra time to implement Strong Customer Authentication (SCA) rules in order to minimize potential disruption to consumers and merchants[513].

The drafting process of RTS demonstrated how difficult it had been to strike a balance between different interests and goals: from clarity to technology neutrality and the need to ensure an effective functioning of the XS2A rule without sacrificing data security and SCA procedures. Not surprisingly, the complexity and the risks of inconsistencies in the implementation of the access to account rule and the related RTSs led the EBA to intervene by issuing an Opinion aimed at helping and coordinating private standardization entities operating across the EU[514].

3.4 The role of API standardization for financial data access

It is widely believed among scholars and practitioners that APIs are the most reliable technologies for implementing the XS2A rule and ensuring a smooth flow of data between financial undertakings[515]. APIs are sets of protocols which define how software interfaces communicate and interact with one another. By allowing a service provider to seamlessly access the data collected by another entity, APIs are set to foster interoperability among different players and promote the exchange of datasets or data streams between data holders.

However, despite their clear pro-competitive potential, there is no consensus among market players regarding who should establish the APIs or, even more importantly, whether to standardize their creation. It follows that a crucial step to deliver a smooth functioning of the XS2A rule would depend

[511] Commission Delegated Regulation 2018/389 supplementing Directive 2015/2366 of the European Parliament and of the Council with regard to regulatory technical standards for strong customer authentication and common and secure open standards of communication, OJ L 69/23 (2018). See also European Banking Authority (2018c).
[512] Commission Delegated Regulation 2018/389, Article 38(2).
[513] The UK Financial Conduct Authority published a statement on its website confirming an 18 month extra time period, https://www.fca.org.uk/firms/strong-customer-authentication. In the same vein, the German Federal Financial Supervisory Authority stated that payment service providers domiciled in Germany will still be allowed to execute credit card payments online without SCA even after 14 September 2019, https://www.bafin.de/SharedDocs/Veroeffentlichungen/EN/Pressemitteilung/2019/pm_190821_PSD2_Kundenauthentifizierung_en.html;jsessionid=335A78B781BFC32EDC09B1E24F34B84B.1_cid363. On the same note, the Austrian Financial Markets Authority (Finanzmarktaufsichtsbehörde – FMA) postponed implementation of SCA performance in Austria, https://www.fma.gv.at/fma-verlaengert-frist-zur-umsetzung-der-starken-kundenauthentifizierung-bei-kartenzahlungen-im-e-commerce-bereich/.
[514] European Banking Authority, *Opinion on the implementation of the RTS on SCA and CSC* (2018).
[515] Portuguese Competition Authority (2018); Spanish Competition Authority (2018), 58 and 87; UK Financial Conduct Authority and HM Treasury (2017), 2; Zachariadis and Ozcan (2017).

on how ASPSPs would set up their data sharing interfaces[516]. This could include making data available in machine-readable formats and the provision of associated metadata[517]. Even if several policy makers and market participant took a strong stance in favor of open, standardized and well-documented APIs, every strategy comes with its own weaknesses. On the one hand, standardized APIs working as one-stop shops could hinder innovation as firms would be precluded from experimenting on their own interfaces, which could potentially be more effective than the ones chosen for the whole market. On the other hand, if ASPSPs were to design their own APIs in subtly different ways, it would become tremendously challenging for TPPs to develop services capable of plugging-in with each of them. This would likely result in a chronic lack of interoperability and negatively hinder consumer welfare[518].

Furthermore, even the PSD2 objectives of commonality and harmonization would be seriously at risk of remaining dead letter. For these reasons, allowing a wide range of API standards to be adopted throughout the Internal Market would pose a serious threat that needs to be duly considered. Conversely, a minimum level of standardization would enable developers to write innovative applications that work efficiently across European ASPSPs and across borders in a harmonized way and would provide some building blocks on which Open Banking could lay its foundation. Against this background, the European Parliament took a strong stance in favor of the creation of a set of standardized APIs that undertakings could use as a shared language and highlighted the importance of interoperability for the rise of FinTech innovation[519].

In January 2019 the EBA established a Working Group on APIs with the aim to identify issues and challenges that market participants face during the testing and use of API interfaces and to propose solutions on how the identified issues could be addressed that the EBA and national authorities will then consider[520]. The need of such a coordination became clear in the aftermath of the several APIs

[516] Milanesi (2017), 75-78

[517] On the role of APIs and standardization strategies for data sharing regimes, see Chapter 3.

[518] See Spanish Competition Authority (2018), para 4.102 suggesting to ensure technological neutrality and interoperability through APIs.

[519] European Parliament (2017), 13. See European Commission (2017h), 9, highlighting that most respondents to the public consultation underlined that interoperability is a priority for the FinTech market, and that further standardization is needed: standards and technical specifications should be developed by market participants and by the industry, and the use of global standards should be promoted, as opposed to national or regional standards. Furthermore, a majority of respondents promoted the adoption of an open source model where libraries of open source solutions would be made available to developers and innovators.

[520] The EBA Working Group consists of 30 representatives from ASPSPs, TPPs, API initiatives, and other representatives from standardization bodies technical service providers and payment service users. On 11 March and 1 April 2019, the EBA published clarifications to the first. In European Banking Authority (2019a) and European Banking Authority (2019b) it is possible to find the list of issues that had been raised and discussed by participants of its Working Group. They relate to (i) the practical aspects regarding the reliability of testing platforms, (ii) the alignment of

initiatives surfaced with the purpose of leading the development of high-performing and customer-focused APIs under PSD2. Standardization and harmonization measures are crucial to reduce barriers to entry: if a common standard did not exist, TPPs would have to comply with all the different interfaces adopted by accounts providers, thereby facing extremely high transaction costs.[521] Furthermore, a clear data standardization framework ensures the integrity and readability of the transaction data shared between market participants.

3.5 The rise of Open Banking: opportunities and risks

Upon the development of FinTech innovation hinges an evolution of banking which is commonly referred to as Open Banking[522]. By this expression is meant a new financial ecosystem rooted mainly on interoperability and data-enabled services stemming from the enhanced power conferred on customers to exploit their own transaction personal data by allowing third parties to access it. Within an Open Banking environment, customers can easily perform banking activities with different providers acting as AISPs, relying on a single online app to collect all the data necessary to manage their finances, bringing together payment accounts and other products like mortgages, pensions and investments[523].

The EU and, as it will be showed in the next chapter, the United Kingdom are paving the way towards Open Banking, accelerating its process through regulatory and legislative reforms alongside standardization support measures[524]. Regulators sought to drive such change by allowing third parties to access users' accounts as well as payment-related data, enabling them to deliver a vast array of new services. Although more slowly, government authorities and policy makers in the U.S. have also shown interest in this area[525]. As we have seen, Open Banking has the potential to boost competition within banking and financial markets which have traditionally been affected by lock-in problems and high barriers to entry. Indeed, the XS2A rule can contribute to the removal of incumbency advantages related to the exclusive access on customer transaction history for business and private loans or the

functionalities and data requirements between API initiatives, (iii) the identification for Qualified Trust Service Providers (QTSPs) issuing eIDAS certificates, iv) the availability, performance and support offered for APIs, v) the list of TPPs interested in testing the interfaces developed by ASPSPs, vi) the access to ASPSPs' testing facilities to not authorized TPPs, vii) the timelines for the fall-back exemption process.

[521] Berner and Judge (2019).

[522] Euro Banking Association (2016); Euro Banking Association (2017); European Banking Authority (2017g); UK Open Banking Working Group (2016).

[523] Deloitte (2018).

[524] Milanesi (2017), 50-105

[525] Evaluation and investigations have carried out by the Consumer Financial Protection Bureau (2017), in order to chart markets evolution and gather stakeholders' insights.

unbundling of banking products traditionally sold together[526]. Similarly, consumers as well as businesses will benefit from greater control over their financial resources and part of their data, enabling them to move and manage funds between several accounts held in different banks through a single interface[527].

The flourishing of an Open Banking ecosystem hinges on a two-fold building block. First and foremost, transaction data that form the lifeblood of this new business environment need to be seamlessly shared, safely controlled and consistently stored by payment providers. Second, consumers are at the central stage of this market evolution and their engagement is crucial for the effective functioning of the XS2A rule and the commercial viability of several FinTech service providers[528]. Given the relevance of these factors, it worth providing an overview of the evolution and main issues underpinning the efforts to deliver data integrity in the context of Open Banking. Similarly, the inherent need to guarantee the reliability in transaction data sharing mechanisms force to take seriously consumer protection as well as its most innovative developments.

As far as data integrity is concerned, the XS2A rule was already envisaged together with a clear framework of technical rules to ensure adequate levels of confidentiality and the integrity of the users' security credentials as well as requirements for common and secure communication between TPP and banks. These provisions are aimed at maintaining consumer trust in digital payment services. A such, this regulatory body makes clear that customer explicit authorization is necessary to allow any form of data access. Namely, the PSD2 requires that a procedure referred to as strong customer authentication (SCA) is followed whenever a customer access his own online payment account, initiate electronically a payment order or carries out an action through a remote channel that implies a risk of payment fraud or a cyber threat[529]. This procedure implies that at least two out of the three following factors need to be provided in order for a user to get authentication: something only the customer has (e.g. a mobile phone, a card reader or a secure key generator), something only the customer knows (e.g. a pin or a password) and something only the user is (e.g. eye or other biometric recognition or fingerprint). As illustrated in the previous pages, the EBA has been entrusted with the task of providing reasonable exemptions to the SCA principle in order to strike a balance between

[526] Carney (2017).

[527] The beneficial impact of such services would vary depending on the percentage of customers with more than one active bank account, a figure which is not homogenous across Europe. As reported by Evans (2015), 27-29, multi-banking appears well-established across international markets: 62% of German consumers use more than one bank, as do 40% of Italians, 43% of French consumers, 47% of UK consumers, 49% of Americans, and in China and Japan virtually all consumers (94%) have relationships with more than one bank. See also Canadian Competition Bureau (2017).

[528] Borgogno and Poncibò, (2019); Colangelo and Maggiolino (2018).

[529] PSD2, Article 97(1).

competing objectives, such as data security, the promotion of competition and technology neutrality for different business-models[530].

Cyber threats such as frauds and potential data breaches and abuses by either users or unauthorised subjects have been explicitly targeted by the EBA and the Commission[531]. More specifically, the RTSs explicitly acknowledge the dynamic nature of cyber-risks by requiring the adoption of continuous learning processes so to identify innovative solutions on a continuous basis[532]. Furthermore, to ensure that payment providers effectively comply with these conditions, all the security measures involving SCA as well as the measures to protect confidentiality and integrity of the personalised security credentials, and the common open standards of communication are subjected to documented periodic tests[533]. In this respect, independent auditors with expertise in IT security will need to evaluate and audit such procedures. Further, in order to allow competent authorities to monitor the quality of the review of these measures, such reviews should be made available to them upon their request[534].

On top of this, additional principles have been laid down with the aim of reducing to the maximum extent possible undue influences from unauthorized third parties[535]. In the same vein, since data traceability represents a cornerstone of RTSs framework, payment providers have to take specific precautious, such as unique identifiers of each payment session and security mechanisms and timestamps ensuring knowledge ex post of all events relevant to the electronic transaction at all the various stages[536]. All the exemptions to SCA set forth in the RTSs depends on stronger safety requirements that providers need to show[537]. Moreover, whenever real-time transaction risk analysis confirms that abnormal spending or behavioural patterns of the payer have been identified (including information on the location of the payer and of the payee), then SCA procedures need to be reverted and put in place again[538]. The ultimate goal of such provision remains the same: ensuring the trustworthiness of the transaction data access mechanism enacted in the PSD2.

Despite the clear pro-competitive potential of Open Banking, it is important not to underestimate the emerging risks for those individuals who lack the resources to fully benefit from FinTech innovation. Admittedly, the increasing digitalization of transaction activities poses risks of discrimination,

[530] European Banking Authority (2017c), 15.
[531] Commission Delegated Regulation 2018/389, Recital 1. See also European Banking Authority (2018c), 10.
[532] Commission Delegated Regulation 2018/389, Recital 2. See also European Banking Authority (2018c), 14.
[533] Commission Delegated Regulation 2018/389, Article 3(1).
[534] Commission Delegated Regulation 2018/389, Article 3(3).
[535] European Banking Authority (2017c), 16.
[536] Commission Delegated Regulation 2018/389, Article 29.
[537] Commission Delegated Regulation 2018/389, Recital 9.
[538] Commission Delegated Regulation 2018/389, Article 18(2)(c).

exploitation and manipulation of vulnerable consumers. By drawing on the lack of accountability and opaqueness of algorithms-based decisions, concerns have been raised that consumers could end up surrounded, tricked and ultimately damaged by not transparent and overly complex mechanisms (i.e. the "black box" problem)[539]. Arguably, financial providers can easily hide not only the biases and logics of the algorithms used, but also the sources of the data collected. When it comes to big data it is extremely tricky for supervisors (not to mention individuals) to determine how data have been correlated and whether unrelated information have influenced the final decision involving them[540]. This is particularly true if one considers risks of unintentional (or even intentional) discrimination that inevitably arises when the quality and the quantity of the data selected may significantly influence the algorithmic outcome[541]. Moreover, since comparison websites and algorithms are complex products, consumers may have difficulty assessing the benefits and costs of each product and comparing between them[542]. Lastly, persons who are un-networked and do not use technologies for various reasons (e.g. lack of digital literacy, lack of accessibility to the digital devices, lack of trust in digitalized services) could be denied access to financial services[543].

On a different note, some scholars stress that the additional information derived from applying big data analytics to users' digital footprints may improve financial inclusion and develop innovative financing solutions[544]. Indeed, rather than being an alternative for credit bureau information, digital footprints may act as a complement to traditional creditworthiness methodologies[545]. As a result, FinTech players providing this kind of analysis can have the potential to reduce the share of unbanked people worldwide by giving them access to credit when credit bureaus scores are not sufficiently reliable, thereby fostering credit inclusion and lowering financial inequalities.

Last but not least, the impact of regulatory interventions aimed at strengthening the bargaining power of customers *vis-à-vis* banks by means of data control mechanisms can be regarded as a new frontier of consumer protection policy, as it will investigated in the next chapter[546]. By allowing specific third

[539] Pasquale (2015).
[540] Ferretti (2018), 491.
[541] Ferretti (2018), 491
[542] See Zernik A. (2020), arguing that bounded rationality limits consumers' ability to assess the benefits of products offered by FinTechs and, even if consumers have a demand for a certain product or service, behavioral biases may lead them to prefer free products or advice, even if this reduces the quality of the services they receive or makes them more expensive overall.
[543] Ferretti (2018), 492.
[544] Berg, Burg, Gombović, and Puri, (2019). See also Vives, (2017), 99, noting that the main developments in the application of digital technology have occurred so far in lending, payment systems, financial advising, and insurance, because in all those segments of business FinTech has the potential to lower the cost of intermediation and broaden the access to finance increasing financial inclusion.
[545] Berg, Burg, Gombović, and Puri, (2019).
[546] Colangelo and Maggiolino, *From fragile to smart consumers* (2018).

party providers to access their own transaction data, consumers can get help to choose between competing financial products thereby avoiding the losses traditionally incurred due to bounded rationality[547]. Not only they would benefit from new and data-enabled instruments to navigate the market, but they could receive suggestions tailored on their specific needs thanks to the application of data analytics to their own economic behaviors and needs. Ultimately, by departing from paternalistic and defensive approaches which proved to be rather ineffective,[548] facilitated forms of customer data access has the potential to put consumers in charge of their digital data portfolio and increase their gains.

Against this backdrop, the XS2A rule enacted by the PSD2 is worth of specific consideration as its main economic rationale is the empowerment of retail banking customers over their own transaction data so that they could benefit from a strengthened bargaining position. By allowing TPPs to access their own transaction data, customers can get help to choose between competing financial products thereby avoiding the losses traditionally incurred due to limited rationality[549]. Not only they would benefit from price comparison tools to navigate the market, but they could receive suggestions tailored on their specific needs thanks to the application of big data analytics to their own economic behaviors and needs.

Admittedly, Open Banking is providing one of the most advanced testing grounds for the application of behavioral consumer protection remedies[550]. If the XS2A mechanism holds its promise, it will lead to the wide-spread usage of money-management tools (helping consumers to with managing and budgeting money across different accounts and banks), price-comparison and switching services (preventing banks from exploiting consumer stickiness) and target provision of financial services from different players (allowing consumers to unbundle the one-stop-shop up to now represented by many banking incumbents)[551]. As demonstrated by the extensive on-going antitrust remedy carried out by the CMA in UK which will be dealt with in detail over chapter 4, the PSD2 structural intervention lays down the foundation to tackle consumer disengagement and systematically reduce information asymmetries traditionally affecting the relationships between providers and financial consumers.

3.6 Protecting the gate: incumbents' survival toolkit

[547] Zernik, (2019).
[548] Ben-Shahar and Schneider (2010).
[549] Zernik, (2019).
[550] Bar-Gill (2012), 12.
[551] Basso, Bon, Tasker, Timan, Walker, and Whitcombe (2018).

Against this background, we deem it useful to carry out an early overview on the new competitive dynamics that are likely to arise in such a new Open Banking environment as well as an assessment of the role that antitrust regulators are called upon to play.

By opening the banking infrastructure to TTPs, regulators are setting the stage for platform business models to be implemented in the retail market. Instead of being disintermediated by new players, banks have the opportunity to take full advantage of their gatekeeper role and position themselves as new platforms allowing interaction between customers and third-party service providers (such as, primarily, AISs and PISs) [552]. Essentially, Open Banking is laying the foundation of a new multi-sided markets model based on banking platforms acting as intermediary for both account holders and FinTech companies and generating potential value for both sides[553]. In such market structure, a platform facilitates the interactions between two or more groups of economic agents that mutually depend on each other and that, without the platform, could not possibly generate value through their business model. In an Open Banking environment there would be indirect network effects generating externalities which could not be internalized through a bilateral interaction: the account service provider platform, thus, is essential as long as third-party payment providers decide to provide only AISs and PISs. It comes as no surprise, then, that the intermediary role played by banks would be essential to allow independent FinTech companies to enter the market, and ultimately to deliver better services to consumers. Furthermore, a sufficient number of economic players on each side of the market would need to be gathered in order to reach a critical mass to prompt a network effect, thereby making one banking platform more attractive than others.

Owing to the reduction in switching costs generated by the PSD2, banks are likely to compete fiercely to attract as many new customers and third-party providers as possible in order to wholly exploit network effects on both sides[554]. Larger banks have already started developing interfaces to allow outside developers to access their platforms under controlled conditions. Similar to what Google did by opening its mobile operating system Android, financial companies that want to gain (and maintain) a leading position in such a new ecosystem would need to provide APIs to outside developers, who can then build new products on the banks' platforms[555].

Since FinTech competitors are putting pressure on the traditional business model of banks, incumbents face the dilemma of partnering with or fighting against newcomers[556]. Incumbent banks

[552] Brainard (2017).
[553] On the industrial organization analysis of banking business focusing on its two-sided market nature, see Vives (2016).
[554] Zachariadis and Ozcan (2016), 13.
[555] Brainard (2017), 6.
[556] Boot (2017), 90-91; Vives (2017), 100-103.

have a wide range of options when deciding how to deal with the perceived FinTech opportunity or threat and could choose from several business models how to get ready to navigate such a new open environment[557]. Notably, banks may adopt a marketplace model, according to which customers can access third parties' products and services alongside the bank's core products[558]. Alternatively, they could decide to operate a so-called plug-and-play business model (akin to the platform developed by Apple). In this scenario, the bank is expected to develop a set of open APIs that any third-party could use to develop complementary services and products.

Banks implementing a platform business model might be subject to a sort of regulatory responsibility to ensure that competition on their platforms is fair, unbiased, and pro-users[559]. Indeed, many platforms act as regulators, setting up the rules and institutions through which their users interact. These measures could involve default options, rankings, access to APIs, search filters, recommendation systems and feedback, allocation of responsibility internal framework, dispute settlement regimes and sharing of information.

Acting as regulators and being at the same time participants in the market, banking platforms may leverage their power by bundling new services with traditional products or engaging in self-preferencing, i.e. giving preferential treatment to their own products and services compared to those provided by other entities[560]. Accordingly, competition law authorities and sector regulators must ensure that banking platforms do not engage in unfair practices that hinder access to the platform or leverage their monopoly power to adjacent markets. This topic will be addressed in better detail within the next chapter.

Moreover, antitrust agencies have to oversee coordinated activities and collusion among incumbents. For instance, in October 2017 the European Commission carried out some inspections in the offices of European banking associations in Poland and the Netherlands looking to find evidence of alleged anticompetitive practices aimed at blocking non-bank-owned providers of financial services from gaining access to the account data of customers who authorized it[561].

[557] Deloitte (2018), 134-142.
[558] Milanesi (2017), 158.
[559] Crémer, de Montjoye, and Schweitzer (2019), 60-61.
[560] European Commission, Case AT.39740 (2017) *Google Search (shopping)*, fining Google for abuse of dominant position by giving an illegal advantage to its own comparison-shopping service. See Crémer (2019), 65-66.
[561] European Commission (2017). See also the Swiss Competition Commission (2018), which has recently launched an investigation aimed at clarifying whether several financial institutions have reached an agreement to boycott mobile payment solutions of international providers (such as Apple Pay and Samsung Pay) in order to protect TWINT, their own Swiss payment solution.

Lastly, another option for the incumbents to pre-empt competition from innovating firms and eliminate the threat posed by them is represented by strategic mergers and acquisitions. Notably, this may happen when a dominant platform acquires an innovative start-up to terminate the development of its innovation (so called 'killer acquisitions')[562] or to integrate it into the existing ecosystem. In this respect, according to some studies the antitrust merger assessment should be adapted to the peculiar features of digital markets and embrace an innovation-based theory of harm challenging acquisitions that may lessen actual or potential competition by reducing future levels of innovation and consumer welfare[563].

While at the beginning acquiring FinTech companies has proven to be a very popular strategy amongst incumbents, in recent years the financial services industry and FinTech seem to have realized they are better off as friends than as foes. Some empirical studies suggest that banks prefer to interact with FinTechs as service providers, avoiding expensive and sophisticated integration efforts[564]. Indeed, to date, the relationship between incumbent financial institutions and FinTech firms appears to be largely complementary and cooperative in nature[565]. In most cases, FinTechs provide the same services as banks in a more efficient way because of technologic complementarities and economic synergies. However, FinTech companies face some competitive disadvantages vis-à-vis incumbent banks. Namely, the absence of an installed customer base, limited access to soft information about potential customers, lack of reputation and brand recognition, a relatively high cost of capital[566]. Therefore, cooperation gives FinTech start-ups access to clients and may reduce their regulatory compliance burden[567]. In turn, incumbents get access to innovative technologies and can gain advantage by being the first ones to offer new products and services.

[562] Cunningham, Ederer, and Ma (2019).

[563] Bourreau and de Streel (2019), 14; Crémer, de Montjoye, and Schweitzer (2019), 117-123; Digital Competition Expert Panel (2019), 92-93

[564] See Drasch, Schweizer, and Urbach (2018), arguing that, according to their empirical database, alliances are the predominant form of cooperation and acquisitions and incubations only play minor roles.

[565] Financial Stability Board (2019b). See also Deloitte (2018), 120, considering an overstatement the claim that FinTech will kill banking.

[566] See Deloitte (2018), 120-121, arguing that advances have proved slower than expected, with FinTech needing to attract more user growth, operating in a heavily regulated environment, and having to apply for banking licences and hire compliance staff; and Zernik (2020), arguing that, in order for FinTech products that serve the interests of consumers to succeed, they must fulfill consumers' biased demand. See also Stulz (2019).

[567] Financial Stability Board (2019b). See Bömer and Hannes (2018), showing that young FinTechs cooperate with incumbents because banks facilitate their market entry, increase their profits and enable new products by ensuring the fulfillment of regulatory requirements, providing know-how, reputation, products distribution channels, portfolio of clients and financial resources. See also Cole, Cumming, and Taylor (2019), arguing that data on crowdfunding in the U.S. indicate that FinTech and traditional bank finance are complements.

As revealed by a study prepared for the European Commission, potential threats posed by PSD2 have encouraged banks to a react, since data shows that only 3% of the European banks choose not to go beyond compliance, whereas 82% of them are keen on strategic responses[568]. Notably, banks are mainly adjusting their business by improving traditional services and launching new non-banking services. More in general, PSD2 has caused a shift in mindset, bringing into focus the unexploited potential of customer data, and incumbent banks have understood the opportunities arising from the access to customer data to improve offerings and customer satisfaction.

However, by opening the path towards Open Banking, data portability obligations such as those imposed by PSD2 may also favor the entry of players other than FinTech companies, which appear even more fearsome for incumbent banks. Indeed, competition in the digital economy is increasingly a competition between ecosystems, where a few large tech companies (BigTechs), exploiting their networks and the massive quantities of data generated by them, offer a very broad range of services integrated with one another[569].

As pointed out in chapter 1, the competitive impact of BigTech companies may be greater than that of FinTech firms[570]. The activities of BigTech firms in finance started with payments, but are rapidly expanding into the provision of credit, insurance, savings and investment products[571]. BigTech players may constitute a significant competitive threat to traditional banking and could achieve scale very quickly in financial services, in particular where network effects are present, such as in payments and settlements, lending, and potentially in insurance[572]. This issue will be further explored in chapter 4.

3.7 Concluding remarks

[568] Deloitte (2018), 126-128.

[569] Crémer, de Montjoye, and Schweitzer (2019), 33. The Netherlands Authority for Consumers and Markets (2019), has recently launched a market study into the activities of BigTechs on the Dutch payments market to investigate whether these firms have plans to become active competitors on the payments market, what those plans are, and what impact those plans would have on consumers and businesses.

[570] While Apple has recently launched its credit card in collaboration with Goldman Sachs and Facebook is working on a digital currency, Google is expected to offer soon checking accounts to customers in partnership with Citygroup. Rudegeair and Hoffman (2019). See also Bank for International Settlements (2019a), 55-69; European Banking Authority (2018b); Financial Stability Board (2019b), 12-16.

[571] See Frost, Gambacorta, Huang, Song Shin, and Zbinden, (2019), analyzing trends in the growth of BigTech in finance and finding that the drivers of BigTech credit are similar to those of FinTech credit (i.e. economic activity, financial regulation and competitiveness).

[572] Financial Stability Board (2019), 2.

One of the most compelling developments emanating from the technological innovation is represented by the uses of data in the financial sector.[573] Even though financial players have always made use of data to make business choices, the sources and complexity of data which are now readily available are much greater than in the past.[574] The potential applications of big data analytics together with new business models can improve the competitiveness of both traditional banking institutions and newcomers[575].

Whenever technological innovation generates potential disruptive breakthroughs, regulators are expected to quickly assess the effectiveness of their oversight strategies and weigh the advantages and the drawbacks of new interventions. It should not come as a surprise that several incumbents have been eager to invoke more rules for the use of big data techniques in the financial industry. Notably, they raise concerns for what they perceive as a regulatory arbitrage or an unlevel level playing field between regulated financial institutions and FinTech companies.[576] Thus, in order to maintain fair competition among various players, these operators claim that any potential regulatory or supervisory measures should remain technology neutral and that respect for the principle of "same business, same rules" should be ensured. At the same time, since the financial services and banking sectors are heavily regulated, the regulatory framework may represent a significant barrier to market entry and success for FinTech companies[577]. Admittedly, the European Supervisory Authorities duly considered these concerns by examining the many existing pieces of legislation in the financial sector, together with the new data protection system, already address the concerns raised regarding the lack of a level playing field[578]. Eventually they came to the conclusion that legislative requirements existing in these areas constitute an already quite solid framework to mitigate the aforementioned risks.

The overall potential impact of FinTechs on banks and financial institutions is far from clear yet.[579] Major banks still have competitive advantages over other business models. First, major banks have large transactional banking businesses, including personal and small business current accounts in which competition is weak and customer engagement is low. The result is that these banks have lower funding costs and higher levels of transactional fees and charges than other banks and building

[573] European Parliament (2017).
[574] Berner and Judge (2019).
[575] European Banking Authority (2016); Valcke, Vandezande, and van de Velde (2015).
[576] European Supervisory Authorities (2018a), 9-10.
[577] Portuguese Competition Authority (2018); Canadian Competition Bureau (2017); Mariotto and Verdier (2015).
[578] European Supervisory Authorities (2018), 7.
[579] Financial Conduct Authority (2018), 5-8, suggests that major banks still have competitive advantages over other business models..

societies, and earn high yields on overdrafts. Second, major banks obtain higher yields on lending and, at the same time, hold proportionately lower capital than small retail banks and building societies. However, the British Financial Conduct Authority expects in the near term an increased unbundling of personal current accounts as new business models seek to offer services to customers that provide enhanced functionality using customer data and capture profitable revenue streams such as interchange, foreign exchange, and overdrafts. Further, switching could increase, if new business models succeed in capturing the customer relationship. Namely, new business models need to engage consumers and make the prospect of switching more appealing than it has been[580].

However, although the claim that FinTech companies will replace traditional banks has likely been an overstatement, FinTech innovation has an efficiency-enhancing capability since it promotes competition in a market traditionally affected by weak competitive pressure. In this scenario, by forcing banks to share payment information with TTPs on the request of their customers, the PSD2 represents the most advanced example of pro-competitive regulation as it is expected to trigger competition in retail banking markets as well as in new data-enabled markets. Additionally, it is paving the way for a transition towards an Open Banking environment. From a competition policy perspective, this initiative is grounded on sound economic reasoning as it provides for a general duty on incumbents to grant access, on a non-discriminatory basis, in favor of new entrants which would otherwise be precluded from providing their services. Indeed, as acknowledged by the European Commission, in many business models for third parties providing payment services, prior information on the availability of funds on the consumer's payment account is a key element, hence in order to provide AISs and PISs, TPPs need to access the customers' accounts using the existing account infrastructure put in place by banks and the customers' credentials[581].

Even though the XS2A rule can be regarded as a sector-specific data portability mechanism with great potential to open up the retail banking market, the implementation process of the mechanisms entrusted with the task of executing the XS2A rule is going to be crucial for its future success. Interoperability is a priority for the FinTech market and standardization initiatives aimed at defining shared, open APIs are encouraged in Europe and in other countries (e.g. Australia, Canada, Mexico, Japan, Singapore). In this regard, the approach of the XS2A rule enshrined in the PSD2 and the Open

[580] See also Navaretti, Calzolari, Pozzolo (2017), arguing that there are strong complementarities between banks and FinTechs, and the business model of FinTechs is likely to gradually converge towards that of banks, since FinTechs will also have to bundle several services if they wish to expand their activities (as for the crowdfunding) or integrate their services with those of banks (as for the payment systems). According to de la Mano and Padilla (2018), while FinTechs' competitive impact may still be significant in payment solutions and in the provision of advisory services in capital markets, their ability to effectively compete in other retail banking markets, in particular in the origination and distribution of consumer and SME lending, is unclear.

[581] European Commission (2013c), 130 and 137.

Banking project in the UK stands out as best a practice for the development of other pro-competitive data sharing regimes and their follow-up implementation measures. Similarly, as made clear by the RTSs drafting saga, a coherent framework of regulation ensuring high levels of consumer protection and data integrity across Open Banking ecosystems is crucial to earn consumer trust.

The introduction of the XS2A rule should be appreciated since the need to guarantee safe and stable access to a newly arising vertically interconnected multitude of players is beyond the scope of the existing antitrust toolbox. Indeed, competition law is inherently based on a discrete assessment of the single case at stake, thus antitrust enforcement seems unable to target consistently competitive challenges as broad as the needs of the FinTech wave. This does not mean that regulatory intervention alone could prove adequate to make competition and innovation thrive in the retail banking market as well as in the payment system. Rather, antitrust enforcement shall be considered as a complementary tool necessary to address more subtle forms of anti-competitive practices which could not be addressed through regulatory implementation mechanisms[582]. Therefore, competition authorities are called to oversee the transition towards Open Banking driven by the regulatory intervention of the EU policy maker. Since incumbents retain strong incentives to foreclose new FinTech entrants and the implementation process of the XS2A rule is inherently complex, traditional banking players can easily engage in subtle forms of anti-competitive practices which risk frustrating the potential of the XS2A rule.

Lastly, a pivotal role in determining the pro-competitive goal of the regulatory intervention at stake will be played by consumers' reaction and feedback. Data mobility and open standards are tools with great potential to secure greater competition by giving consumers effective choice over their digital services[583]. By embracing the digital revolution, with the XS2A rule envisaged in the PSD2, as well as the right to data portability granted by the GDPR, the European Union has adopted a consumer-centric perspective enacting regulatory provisions aimed at empowering individuals with more control over their data and digital choices. Indeed, these provisions share the same rationale, that is to enable and encourage inter-platform competition in digital markets by lowering consumers' switching costs and avoiding personal data lock-in. Hence, the potential disruptive impact of the access to account rule strongly depends on whether consumers will embrace the proactive approach promoted through these regulatory initiatives[584].

[582] The Netherlands Authority for Consumers & Markets European Commission (2017), 34.

[583] Digital Competition Expert Panel (2019), 9.

[584] Survey and empirical analysis so far have provided puzzling results. For instance, in the UK, according to Bain & Company (2018), 63% of retail customers are open to share financial data regarding their accounts with a competing FinTech firm in pursuit of a more efficient service or product. Conversely, YouGov (2018), finds that over three quarters (77%) of British adults would be concerned about sharing their financial data with companies other than their main bank.

CHAPTER 4 - Shaping competition policy for open banking eco-systems

Short abstract of the chapter

This chapter provides a critical assessment of the competitive impact arising from the regulatory endeavours undertaken by the European Union and the United Kingdom with reference to the establishment of Open Banking environments through pro-competitive regulation.[585] By drawing on the theoretical framework developed in the previous chapters as well as the details of PSD2 implementation, I develop some of the most challenging issues policy makers need to take into account when addressing competition policy in the face of Open Banking-enabled data sharing ecosystems. In particular, this chapter is divided into two sections. The first deals with the impact of pro-competitive regulation for consumer welfare in retail banking. The second analyses some possible regulatory reactions to the potential entry of BigTech firms in the financial sector with reference to the competitive dynamics of Open Banking.

I Section: The impact for consumers

4.1 Introduction. Data governance as a consumer-empowerment tool

The issue of consumer engagement in markets has troubled regulators and policy makers for years as it undermines the functioning of sound competitive markets by allowing incumbents to enjoy economic supra-competitive returns to the detriment of innovation and consumer welfare. The market investigation into the banking industry launched by the UK Competition and Market Authority (CMA) in 2016 represents an original attempt to tackle the problem through antitrust enforcement. By building on the access-to-account rule enshrined within the European regulatory framework of

Moreover, only one out of three (28%) British adults are aware of the transition towards Open Banking currently taking place. Finally, consumer stickiness remains a serious challenge as two thirds (63%) of British people declare to be satisfied with the service provided by their current bank and are therefore not eager to get financial services from alternative entities. At the same time, the survey run by Accenture (2017), shows that 69% of consumers considering Open Banking are concerned by cyber threats and data protection risks and 53% of the customers are likely to remain loyal to their existing banking providers. Notably, as showed by Ernst & Young (2017), usage of FinTech products and services is going to vary depending on age.

[585] The chapter is based on the following articles: Borgogno, Oscar and Colangelo, Giuseppe (2020) "The data sharing paradox: BigTechs in finance". *European Competition Journ*, *al* 16, no. 2-3 (2020): 492-511; Borgogno, Oscar and Colangelo, Giuseppe (2020). "Consumer Inertia and Competition-Sensitive Data Governance: The Case of Open Banking", Journal of European Consumer and Market Law 9, no. 4: 143-150.

the revised Payment Service Directive and the most recent developments of FinTech innovation, the CMA has designed a set of measures aimed at addressing some of the structural features causing adverse effects on competition in the retail markets, ultimately paving the way towards Open Banking. The chapter highlights the rationales, benefits and potential drawbacks of the UK Open Banking plan, investigating if this regulatory intervention can act as a blueprint for harnessing the competitive potential of data-driven innovation of the financial industry and the digital economy as a whole. The first part of the chapter illustrates the negative impact of consumer disengagement, focusing on the retail banking industry. It explains how FinTech innovation and data-enabled services can be harnessed by regulators and policy makers to strengthen the bargaining power of consumers within Open Banking eco-systems. Section 4 delves into this issue by investigating the CMA Open Banking project. I argue that Open Banking could also work as a blueprint for other regulated markets. Finally, chapter summarizes the promises and perils of Open Banking initiatives.

The second part of the chapter delves into regulatory treatment of Open Banking environments. By building on the analysis of pro-competitive regulation in chapter 3, the work describes the unintended economic effects of access to account rule enshrined in the PSD2 and provides a critical assessment of the proposals advanced to address the entry of BigTechs in the financial sector. The chapter points out that the European wave of regulatory interventions aimed at promoting access to data and data sharing shows no signs of stopping. A growing number of practitioners and scholars is concerned about alleged unintended consequences of data portability in financial markets. In particular, new calls have been voiced to contain the engagement of BigTech platforms with retail banking. After a critical assessment of such arguments, I argue that asymmetrical regulatory measures imposed on BigTechs entry in the financial industry may tilt the market in favor of incumbent banks.

As FinTech start-ups seem more likely to work alongside incumbent banks rather than compete with them, limiting the entry of BigTechs may remove the only effective source of competitive pressure for traditional bank, thereby ultimately frustrating the pro-competitive potential of the access to account rule enshrined in the revised Payment Service Directive (PSD2). Consumer behaviour influences market dynamics, and consumer engagement plays a pivotal role in driving effective competition. Suppliers enjoy greater market power whenever consumers face hurdles in accessing relevant information and comparing market prices. Furthermore, limited switching between providers reduces incentives for entry and for vigorous competition. Indeed, consumer inertia should be regarded as an actual barrier to entry and expansion for newcomers[586]. Consequently, incumbents

[586] Several studies investigate the features and dynamics of competition in digital markets have identified consumer behavior as a barrier to entry and considered that customer inertia is reinforced by a default bias so that default settings have had a profound impact on the shape of competition in digital markets: see e.g. Australian Competition and Consumer

tend to take advantage of such a behavioural weakness by charging higher prices to customers who are not inclined to switch providers. In other words, longstanding customers pay a "loyalty penalty" bearing higher prices than more engaged ones for the same services[587].

For these reasons, the presence of disengaged consumers who find it costly to switch from their current provider is of the utmost importance for market authorities, and demand-side interventions are increasingly becoming top priorities in the agendas of regulators and antitrust authorities[588].

In this scenario, emerging digital technologies bring new competitive tools and business models that could encourage consumer searching and shopping around. This development could be put to good use for consumers by means of regulatory mechanisms allowing for better data control. More specifically, digital technologies could encourage searching, shopping around and, more generally, could empower consumers by raising their awareness and making them conscious decision-makers in the markets. Simply relying on engaging consumers by providing them with more information has proven to be a rather ineffective approach[589].

4.2 The evolution of consumer law in the EU: from protection to engagement

Consumer law is a relatively new legal field whose birthday is commonly associated with the speech of President John F. Kennedy on March 15, 1962 which opened the gate to a new kind of legislation aimed at fostering consumer awareness vis-à-vis businesses[590]. European countries followed suit in the span of ten years by envisaging a legal framework more strongly focussed on the *protection* of the consumer, defined as the weak party in the contractual relationship[591]. As consumers were defined as those acting out of their business or professional activity, the doctrinal analysis put the emphasis on the imbalance of powers of individuals comparing to professionals and corporations. In its very essence, the market failure which needed to be addressed was the informational and contractual power asymmetry between the bargaining parties[592].

Commission (2019), 68; Crémer, de Montjoye, and Schweitzer (2019), 50; Stigler Committee for the Study of Digital Platforms (2019), 19-20; UK Competition and Markets Authority (2020), 13.

[587] UK Competition and Markets Authority (2018).

[588] Fletcher (2019); OECD (2018); UK Competition Network (2018). See also The Netherlands Authority for Consumers & Markets (2019); Beckert, Siciliani (2018), analyzing regulatory policy interventions aimed at protecting vulnerable consumers who are disengaged and thus exposed to exploitation.

[589] UK Government, Department for Business, Energy and Industrial Strategy (2018), 7. Further, see Fletcher (2019) highlighting that proper solutions require considering two categories of consumer disengagement, that is conscious and unconscious disengagement.

[590] Kennedy (1962).

[591] Jabłonowska, Jabłonowska, Nowak, Micklitz, Pałka, and Sartor (2018).

[592] Micklitz (2012).

Starting from the 1980s, the European Union – at the time still the European Economic Community – progressively acquired competence in this domain. It is possible to distinguish an evolutionary path across which consumer policy progressively evolved until the current state[593]. Originally, the Community followed similar objectives to the ones of Member States, with a strong focus on consumer protection coupled with the principle of minimum harmonisation[594]. Therefore, the subsequent legislation enacted by the European Commission in the field of product safety[595] and unfair terms[596] was aimed at providing protection in favour of consumers as weaker parties. It is worth noting that even at such an early stage, the European legislator was sensitive to efficiency and market considerations too. For instance, the practice of selling at the doorstep was tackled not with a general ban, but with the right to withdraw[597]. Moreover, the concept of legitimate expectations was deployed within the legal framework on product liability and unfair terms serves to balance protection needs and market considerations[598]. Moreover, during this period, legislators tried to protect consumers with a broad set of mandatory consumer rights.[599] From information duties and shift of proof, to remedies, withdrawal rights and disclosure rules, European consumers are now empowered with several provisions aimed at ensuring protection against abuses and exploitative practices carried out by merchants.

Despite such an initial focus on protection, consumer law evolved towards more market-friendly approaches over the following decades. As pointed out by several scholars, this shift was apparent already at the rhetorical level of policy documents[600]. By way of illustration, the final objective was not anymore shielding the consumer from commercial threats, but rather allowing her to "benefit from the opportunities presented by the information society"[601] and "to realise the benefits of the internal market"[602]. At the same time, the principle of full harmonisation proved to be more effective

[593] For an analysis of the role played by the main schools of legal thoughts in the evolution of European private law, see: Poncibò, Borgogno (2021).
[594] According to the Council, such an accentuated imbalance resulted in the need to keep consumers "better informed of their rights and protected against abuses". See: European Council, Resolution of 14 April 1975 on a preliminary programme of the European Economic Community for a consumer protection and information policy [1975] OJ C92/1.
[595] Directive 92/59/EEC on general product safety (later repealed and replaced by Directive 2001/95/EC) and Directive 85/374/EEC on product liability.
[596] Directive 93/13/EEC on unfair terms in consumer contracts, Article 5.
[597] Directive 85/577/EEC on contracts negotiated away from business premises; later repealed and replaced by Directive 2011/83/EU on consumer rights.
[598] See the elaboration on the requirements of good faith in the preamble of Directive 93/13/EEC on unfair terms in consumer contracts.
[599] For an overview on this topic in the realm of European private law, see: Hondius (2004); European Parliamentary Research Service (2015).
[600] Jabłonowska, Jabłonowska, Nowak, Micklitz, Pałka, and Sartor (2018), 10.
[601] COM(95) 519 final.
[602] COM(2002) 208 final.

than minimum harmonization in meeting the expectations of legal certainty and efficiency underpinning the Internal Market mechanisms[603].

By hinging around the concept of an "average consumer", this new approach overhauled the legal apparatus so to increase the confidence of market agents in the viability of cross-border free trade also at the retail level[604]. Arguably, European policy moved from consumer protection law to consumer law *without* protection[605]. This stems from the fact that new legal tools deployed to protect consumers were increasingly aimed at ensuring an effective and realistic opportunity to access the benefits of markets (so-called "access justice"), rather than social redistribution or a paternalistic protection of the weaker party[606]. Even though the principle of the weaker party protection has continued to play a significant role in the European consumer law *acquis*, it is fair to argue that the policy approach has developed towards a more nuanced approach based on the engagement of consumers within markets[607].

Next to the vulnerable consumer in need of protection from policy makers, a new paradigm has gradually emerged from the policy strategy of the European Union[608]. Within the digital economy, consumers are more confident and responsible as they can make use of new services and data-enabled abilities to navigate the perils of digital eco-systems. This is reflected also in national courts case law, under which consumers are more active, technology-savvy, attentive, cautious, and well-informed[609].

By way of contrast, different strands of the literature keeps outlining the intrinsic of consumer weakness vis-à-vis the overwhelming technological advantage of business counterparties. According to this narrative, the vulnerability of individuals should be understood as a "dynamic state"[610]. In the same vein, it has been argued that the algorithms-based digital economy brings with it new layers of information asymmetries and risks of discrimination to the detriment of consumers[611]. As systematic

[603] Tonner (2014).
[604] On the notion of "average consumer" in European consumer law, see: Mak (2013). On the need to foster consumer trust and confidence in the viability of the market as a policy objective, see: Weatherill (2001).
[605] Micklitz (2012).
[606] The concept of "access justice" was advanced by Professor Micklitz, who argued that: "access justice means more than a formal guarantee to workers and consumers that they may have a theoretical chance in participating in the market and reaping the benefits of the market. This would be justice in the meaning of the libertarian concept. Access justice in the meaning of Max Weber, quite to the contrary, materialises the equity doctrine. The legal system is responsible for establishing tools which transform the theoretical chance into a realistic opportunity, thereby eliminating all sorts of barriers which hinder the assertion of the claim to access". For an in-depth analysis, see: Micklitz (2011).
[607] Reference is made to the building blocks of European consumer case law of the CJEU, such as: Cases C-59/12 Zentrale zur Bekämpfung unlauteren Wettbewerbs; C-388/13 UPC Magyarország; Case C-137/08 Pénzügyi Lízing; C-415/11 Mohamed Aziz; Cases C-497/13 Faber; C-149/15 Wathelet.
[608] Reich (2016), Colangelo, Maggiolino (2018).
[609] Judgment of the Polish Supreme Court of 17 September 2014 in case I CSK 555/13.
[610] Mik (2016) arguing that: "each consumer can be vulnerable in its own way and vendors have the technological capacity to exploit temporary vulnerabilities – not just those caused by age, mental infirmity or credulity".
[611] Helberger et al. (2017); Sex et al. (2018).

data collection and digital profiling allows targeted offers, the bargaining power of firms controlling and making use of algorithms is set to increase even further. At the same time, it is likely that consumers and digital users are not fully aware of such imbalance when contracting in digital eco-systems, not to mention the exposure to subtle forms of technological and targeted influence[612].

Against this background, it is clear that consumer protection policy keeps evolving together with market dynamics in digital environments. For instance, the risks of consumer exploitation, especially when it comes to the most vulnerable ones in terms of digital skills or behavioural biases, still exist and deserve full attention by regulators. However, this should not lead to underestimate the potential offered by digital integration in order to harness competition in a way that foster consumer autonomy, data control and bargaining power vis-à-vis businesses[613]. Rather than identifying two conflicting views on the promises and perils of data sharing and digital integration for consumer welfare, this chapter adopts a holistic perspective aimed at making the most of the new opportunities offered by pro-competitive regulation while not jeopardizing the most vulnerable categories of digital consumers.

For instance, as already highlighted by many scholars and lawyers, it is often the case that consumers are prevented from exercising effectively all those rights provided by the consumer law *acquis*[614]. As known, many consumers are not aware of their rights or, even if they are, find it difficult to enforce them. In fact, the true problem with B2C contracts is represented by enforcing those rights. Standardized contracts usually contain plenty of mandatory pro-consumers terms, which unfortunately often turn out to be difficult to be exercised.

Only a tiny minority of consumers is willing or has the means to overcome the obstacles surreptitiously posed by businesses in order to hinder consumer rights exercise. Enforcements costs are generally overwhelmingly high and time consuming for individuals. As most of consumer contractual claims are of negligible value, potential reimbursements for consumers are so insignificant to discourage costly suits. To counteract such a problem, the European Union has introduced over the years small claims procedures and encouraged the adoption of collective redress mechanisms by the Member States[615]. However, due to the efforts to avoid the disadvantages of class

[612] For instance, when it comes to assessing the accuracy of an algorithmic prediction made or quality of the advice provided by firms.
[613] Jabłonowska, Jabłonowska, Nowak, Micklitz, Pałka, and Sartor (2018), 12.
[614] See, in this sense: Benöhrp (2013), 44; Ben-Shahar (2009).
[615] See also: Commission Recommendation of 11 June 2013 on common principles for injunctive and compensatory collective redress mechanisms in the Member States concerning violations of rights granted under Union Law, OJ L 201, 26 July 2013, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32013H0396 accessed 26 December 2020.

actions in the United States, collective redress has proven so far flawed and ineffective[616]. A recent attempt to overcome these hurdles is represented by the Directive (EU) 2020/1828 on representative actions for the protection of the collective interests of consumers, entered into force on 24 December 2020, Member States must provide redress and injunctive measures for groups of consumers that have been affected by specific infringements of EU law[617].

On top of that, the majority of consumers is further hampered by the fact that the costs arising from the actions brought by the active minority are distributed (through pricing mechanisms) on the whole spectrum of the demand side. The outcome of such a lack of significant threats for businesses is an incentive not to take consumer rights seriously[618].

Apart from the above-mentioned troubles surrounding consumer protection policies, the main problem is the very low thresholds of cost tolerance consumers are willing to bear. In many cases, even when free of charge enforcement mechanisms are in place, consumers are likely to be discouraged by the efforts required to find out whether they are entitled to trigger any right and how to embark into a claim procedure[619]. Against this background, it is clear that an almost automated self-performing process would improve the systematic functioning of consumer rights protection apparatus.

Recent experience has shown that reducing the hassle of switching can be particularly effective in order to increase customers bargaining power[620]. Indeed, consumer decision-making can be affected by a range of factors which reinforce *inertia*, such as high searching and transaction costs (either real or perceived), behavioural biases and contextual factors, but also by firms' strategic conduct aimed at exploiting these biases and poor consumer information by increasing searching and switching costs, thus taking advantage of these demand-side problems in order to weaken competition[621].

[616] As pointed out by Geradin (2015), 3. EU antitrust authorities took the view that US class action mechanism risk to trigger unmeritorious litigation to the detriment of society as a whole.
[617] Directive (EU) 2020/1828 of the European Parliament and of the Council of 25 November 2020 on representative actions for the protection of the collective interests of consumers [2020] OJ L 409/1.
[618] See, in this sense: Ben-Shahar and Bar-Gill (2013), 109-126.
[619] Reference is made to legal technology companies which collect consumer claims online and enforce them by benefitting from economies of scales.
[620] OECD (2018), 3.
[621] Stigler Committee for the Study of Digital Platforms (2019) 37; UK Competition and Markets Authority (2018a), 6.

4.3 Open Banking as a consumer empowerment tool?

The retail-banking sector has traditionally been affected by low elasticity of demand, consumer adherence, and lock-in problems allowing banks to enjoy economic rents[622].

However, technology-enabled solutions to this longstanding competitive problem are now on the horizon. The increasing pace of technological innovation applied to financial and banking services might alter the bargaining powers between customers and financial providers[623]. This evolution shapes the future of the financial sector and offers the potential to foster competitive dynamics within the retail markets. FinTech developments are likely to transform fundamentally how undertakings will compete and how customers will interact with financial providers[624].

Against this background, the Open Banking project in the United Kingdom is worth being investigated as it aims to update the competition enforcement toolbox and to put technological innovation to good use for consumers[625]. It was conceived by the Competition and Market Authority (CMA) in February 2017 following a three-year long market investigation review into the business and personal banking sector[626].

The UK remedy is based upon the EU pro-competitive regulatory framework that was illustrated in chapter 3. Indeed, the revised Payment Services Directive (PSD2) introduced the access-to-account rule (XS2A) under which account servicing payment service providers (AISPs), such as banks, must allow third parties to obtain real-time data on customers' accounts as well as provide access to such accounts by executing payment orders initiated through payment initiation service providers (PISPs) interfaces, on the condition that the customer has provided explicit consent and that the account is accessible online.[627] Furthermore, banks are under the obligation to grant such access on a non-discriminatory basis both to PISPs and to AISPs.

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[622] Australian Government Productivity Commission (2018); UK Competition and Markets Authority (2107); The Netherlands Authority for Consumers & Markets (2014).

[623] European Commission, Communication on 'FinTech Action plan: For a more competitive and innovative European financial sector' COM(2018) 109 final, 8.

[624] Petralia, Philippon, Rice, and Véron (2019); Vives (2019b); Hoffmann, Bakhoum, and Beneke (2018); UK Financial Conduct Authority (2018), 7-8; Canadian Competition Bureau (2017).

[625] See OECD (2019) 64, arguing that open data initiatives like the Open Banking initiative demonstrate how data can be used to help people transact, save, borrow, lend and invest their money: by increasing transparency in the financial market, the initiative can empower consumers so they become able to better compare existing offerings.

[626] UK Competition and Markets Authority (2017).

[627] Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC [2015] OJ L 337/35. For an extensive analysis see Borgogno, Colangelo (2020).

As illustrated in chapter 3, the PSD2 mechanism provides customers with the ability to control their accounts closely by allowing third party providers to initiate payment orders or to use their transaction data. In this regard, it shares a similar rationale and similar goals to the data portability right enshrined in the new General Data Protection Regulation (GDPR)[628], namely to enable and encourage inter-platform competition in digital markets by lowering consumer switching costs and by avoiding personal data lock-in. While the GDPR explicitly recognises individual control over personal data as an objective of data protection law, allowing consumers to transfer their data from one online provider to another, by introducing the access-to-account rule the PSD2 aims to incite competition within the retail payment markets by empowering consumers to use their data to their own advantage. More generally, the PSD2 and the GDPR represent the cornerstones of the recent wave of European regulatory interventions aimed at promoting the active role that consumers should be entitled to play in the digital ecosystem[629].

As the UK Open Banking is now in the final part of its implementation, it is worth providing an early overview of this measure in order to assess its ability to address market failures in the most innovative business environments. Notably, by analysing its rationale, how it has been designed and how it is intended to affect the banking ecosystem, this chapter aims to evaluate whether or not the approach pioneered by Open Banking represents an effective way of engaging consumers, thus being worthy of being extended to other markets[630].

4.4 The downsides of consumer disengagement: the case of UK banking

The CMA market investigation into the retail and business banking market took almost two years, from November 2014 until August 2016[631]. Evidence emerging from the in-depth analysis into the retail and business banking market highlighted strong weaknesses in terms of competitive dynamics. Despite the entry of new players over the last decade, the CMA found that, on the supply side, the British banking market has been rather concentrated. Namely, the four largest banks (RBSG, LBG, Barclays and HSBCG) were able to retain a combined market share ranging from 70% to 86% depending on the geographical market considered. These market shares have been consistently stable

[628] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC [2016] OJ L 119/1.
[629] Colangelo, Maggiolino (2018).
[630] Fingleton (2018).
[631] UK Competition and Markets Authority (2016).

over the previous decade. On top of this, when looking at overdraft fees and charges, the CMA observed that major banks charged remarkably higher fees than their smaller rivals.

At the same time, the demand side of the market was affected by an extremely low level of customer engagement. According to the survey carried out by the CMA, only 3% of personal current account (PCA) customers switched provider every year and approximately 8% did so every three years. In fact, more than half of retail banking customers stayed with their bank for more than 10 years and three-quarters of them did not look for more efficient alternatives on the market in the previous year. Similarly, switching rates of PCA products within the same provider were very low (2.5%). The lack of consumer engagement in retail banking can easily be appreciated by comparing these data with those relating to comparable markets[632].

Even though switching operations generate transaction costs, consumers overestimate their actual economic impact and significance, as demonstrated by the case of the UK retail banking market. The major British banks established a well-functioning service to allow quick account switching within seven days (Current Account Switching Service – CASS). Despite this reliable and effective service, the CMA found that most consumers were not aware of its existence and continued to worry about the time burden and the problems involved in switching banking provider[633]. Moreover, the Financial Conduct Authority reported that switching rates on PCA accounts remained extremely low and most switching took place between major banks rather than to challengers. Between 2015 and 2016 only 2.4% of the customers of the largest banks switched their account by means of CASS and 90% of switching using CASS was between major banks. The Authority found that switchers tend to be younger and more digitally active, have lower balances, use overdrafts less, and are less likely to hold other credit products with their PCA provider. Further, higher proportion of switchers multi-banks, i.e. has a PCA with another provider[634].

Those findings are surprising when evaluated against the substantial gains that PCA consumers could earn from switching. The CMA found that around 90% of current customers would be better off if they switched to cheaper products available on the market.[635] The gains would be even higher for customers of packaged accounts (i.e. those coming with a vast array of extra features, such as mobile phone and travel insurance, better rates on overdrafts and loans, etc.). Moreover, overdraft users

[632] UK Competition and Markets Authority (2016), par. 66: for example, switching rates in savings products amount to 13% whereas in the energy sector they are over 30%.
[633] UK Competition and Markets Authority (2016), par. 71: only around 2% of all UK main account users switched through the CASS.
[634] UK Financial Conduct Authority (2018), 55-56.
[635] Namely, it was estimated that the average yearly gain from switching to one of the cheaper options currently available would have been over £90 per consumer.

would benefit the most from switching.[636] In light of this evidence, it was clear that consumers were systematically charged above-average fees for the services provided. Due to a mix of behavioural biases and inequality of bargaining power preventing customers from exerting competitive pressure, the retail banking market was remarkably skewed in favour of incumbents[637].

In essence, the hurdles undermining competition in retail banking are twofold. Firstly, consumer inertia is widespread when it comes to PCA product markets. Individuals do not pay much attention to the costs they incur to enjoy a bank account. Consequently, they are often unaware of the financial benefits that could be gained from switching or making better use of their accounts. Customers are prone to underestimating their usage of overdraft services if no alert mechanisms are in place to warn them. Therefore, in the absence of sound regulatory remedies able to nudge consumers effectively towards more efficient choices, they will not behave optimally, ultimately paying the price for this market failure. Accordingly, the rise of more efficient providers is prevented as they face higher barriers to entry.

Secondly, customers bear inherently high transaction costs to engage actively within retail banking markets. Considering the limited resources available in terms of money and time, it is difficult for the average individual to target in the market a range of best options for switching purposes. Comparing and assessing different bank accounts is a complex task that requires the identification of opaque tariffs, hidden charges and the suitability of a product against a person-specific usage pattern. For instance, any evaluation must be centred around the credit balances involved, the likeliness of relying on an overdraft, and how much is paid abroad or online by debit card. These kinds of assessment are unlikely to be undertaken by most consumers. Moreover, one must consider the expected hassle of embarking on such a cumbersome evaluation process and the opportunity costs involved.

In view of the above, it is no surprise that the CMA detected very low pressures on incumbent banks to compete vigorously in order to improve the customer experience or to decrease prices. The relatively few customers willing to switch to intercept better offers did not reach a critical mass able to change the competitive dynamics. Banks managed to address their interests by applying price discrimination techniques: new joiners and switchers received tailored offers economically more

[636] For instance, those with an average overdraft of between 8 and 14 days per month could improve their position by £180 per year.

[637] See Zernik (2020), arguing that bounded rationality limits consumers' ability to assess the benefits of products offered by FinTechs and, even if consumers have a demand for a certain product or service, behavioral biases may lead them to prefer free products or advice, even if this reduces the quality of the services they receive or makes them more expensive overall. For an insightful analysis on biases and consumer behavior in retail financial markets, see Erta, Hunt, Iscenko, and Brambley (2013).

attractive than the ones applied to disengaged consumers. This resulted in customer loyalty in fact being exploited by incumbents, rather than rewarded[638].

By drawing on the developments of technological innovation, the CMA targeted the new opportunities enabled by FinTech as a crucial element of its remedy package to foster competition within retail banking markets by empowering customers.

4.5 The reasons for a market investigation remedy in the U.K.

The increasing pace of FinTech innovation is able to lower transaction costs faced by customers and new players for engaging in financial markets. By using online banking interfaces and data-enabled services, consumers can now have easy access to a wide range of products and services. At the same time, new firms can enter the market by offering innovative services to consumers or cheaper products. For instance, FinTech providers can perform, among other things, domestic and cross-border payment services (through digital wallets or pre-funded e-money), customer relationship management (by providing price comparison, switching services and robot-advisory services), retail and commercial banking services (by offering innovative lending and borrowing platforms), wholesale banking and markets, wholesale payment, clearing and settlement infrastructures[639]. Therefore, technological developments are expected to fundamentally change the way people and merchants access services and markets, generating substantial benefits for the overall industry. Indeed, new FinTech-enabled by-products, such as price-comparison tools and interoperability, can mitigate consumers' unwillingness and inability to switch between firms and to shop around to get the most convenient deals.

Access to transaction data is the key for enabling these new forms of competition in the financial retail market, since the entire sector hinges on the re-use of account and transaction information[640]. It follows that the structure and category of data that financial institutions gather is of utmost importance for the development of FinTech innovation.[641] In this respect, customers' account data represent an extremely valuable raw material for enabling the provision of new services[642]. Conversely, banks enjoy a gatekeeper function not only of customers' finances, but also of transaction data, which is

[638] UK Competition and Markets Authority (2018).
[639] European Parliament (2017), 16.
[640] See Libert, Petersen (2018), suggesting a distinction between soft information (difficult to completely summarize in a numeric score and requires a knowledge of its context to fully understand) and hard information (information that is quantitative, easy to store and transmit in impersonal ways). The latter are more prone to be transmitted readily by means of APIs and modern digital infrastructure.
[641] Navaretti, Calzolari, and Pozzolo (2017).
[642] Borgogno, Colangelo (2020).

vital for the viability of many FinTech services. Therefore, it is often the case that while newcomers are keen to gain access to this essential information, incumbents are reluctant to share their data booty.

As seen in chapter 3, when it comes to retail consumers, the viability of many FinTech business methods relies on ready access to account data held by banks. A remarkable example of this data bottleneck problem is represented by price comparison services. This kind of service hinges on access to up-to-date and detailed consumer information to provide insights, tailored to consumer needs, on competing products existing on the market. Before the revised PSD2, the only way to access such data without asking for permission from the bank involved consisted of so-called screen-scraping. Namely, by sharing personal credentials with a third-party service provider, consumers were able to provide access to their own account data. Several payment providers were accustomed to accessing a large range of data using screen-scraping. Such form of third-party access without identification was forbidden by the EBA as it could expose consumers to a vast array of frauds and personal data breaches.[643] Furthermore, this mechanism is cumbersome and time-consuming.

Since it was highly unlikely that incumbents would ever have agreed to share customer data with potential competitors and open the market to the new form of competitive pressure brought by Open Banking, the CMA found that a market solution was unlikely to emerge by itself[644].

The CMA decided to base the remedy, following the market investigation into retail banking, on the XS2A rule introduced by the PSD2. By drawing on the European regulatory framework, the CMA enacted a complex remedy aimed at paving the way for the adoption of data sharing mechanisms that would be as trouble-free as possible.

Firstly, the measure established by the CMA was intended to standardise data sharing interactions between banks and third-party service providers. Namely, the eight major British banks were mandated to jointly develop a single, open, standardised API freely available for the whole industry. As described analytically in chapter 5, APIs allow a digital application to interact with an associated programme by describing the kind of data that can be retrieved, how to retrieve it and the format in which information will be provided. Secondly, the CMA strengthened consumer protection to ensure market trust in the XS2A, going beyond the basic requirements laid down in the PSD2 (i.e. explicit customer consent, strong customer authentication and secure communication). Thus, banks were duty-bound to publish trustworthy and objective information on the quality of services on their websites and branches in a form capable of being used by comparison tools. Incumbents were

[643] European Banking Authority (2017h), 11. See also Zernik (2020); Zunzunegui (2018).
[644] Basso, Bon, Tasker, Timan, Walker, and Whitcombe (2018).

required to send out suitable notices to consumers outlining any increase in charges or closure of local branches so that they could evaluate whether or not to switch provider of banking services. In order to manage consumer complaints, the CMA asked the Implementation Entity to set up a clear redress mechanism. Finally, the overall reliability of access to account data was secured by the CMA by setting up a ledger of authorised third parties that can seek access to transaction data managed by the Financial Conduct Authority.

Parallel to the API standardisation measure, the CMA launched an "Open Up Challenge" to nurture the development of FinTech innovation solutions by awarding £4.5m of funding, including seed grants, to FinTech businesses and awards to final winners. Firms taking part in the challenge were also provided with APIs enabling exclusive early-stage access to a huge pile of transaction data held in the Open Up Challenge sandbox (a large anonymised transaction dataset). This allowed participants to test their products under the supervision of regulators without incurring the costs of legal uncertainty.

Finally, one must not underestimate the role of interoperability when it comes to Open Banking[645]. The presence of a seamless flow of data between undertakings is at the heart of the numerous APIs standardisation for data sharing initiatives currently under development in several jurisdictions. In this regard, the British Open Banking remedy stands out as the only well-structured mechanism closely monitored by a government body (the Open Banking Implementation Entity) with the goal of delivering a sound implementation of account data access. As pointed out in section 5.3.2, whereas some countries have adopted a more centralised strategy aimed at increasing the pace of the transition towards Open Banking, such as the UK and Poland, others prefer to rely on privately led standardisation initiatives, such as the Berlin Group and STET, a French partnership between six major banks. Given the incentives on incumbents not to cooperate in the implementation of the XS2A rule and the inherent technical difficulties that come with such an ambitious project, this lack of coordination can seriously undermine the actual the ambitious goal of the PSD2 framework. In this regard, the CMA intervention addressed this risk duly in advance by mandating compulsory APIs standardisation.

4.6 Consumer bargaining power in the face of Open Banking

The economic rationale of the CMA market investigation remedy is to empower retail banking customers over their own transaction data so that they can benefit from a strengthened bargaining

[645] Borgogno, Colangelo (2019).

position towards banks. By allowing specific third-party providers to access their own transaction data, consumers can obtain help in choosing between competing financial products, thereby avoiding the losses traditionally incurred due to bounded rationality. Not only can they benefit from new and data-enabled instruments to navigate the market, but they could also receive suggestions tailored to their specific needs thanks to the application of big data analytics to their own economic behaviours and requirements.

Open Banking impact on consumer welfare	
Benefits	**Risks**
Increased data control.	Manipulation and exploitation of vulnerable customers.
Higher level of competition.	Cyber-risks (data breaches, abuses and frauds).
New products and services.	Unfair discrimination.
Facilitated switching between providers.	-
New functionality and better customer experience.	-

Admittedly, Open Banking provides one of the most advanced testing grounds for the application of new behavioural consumer protection remedies. By departing from paternalistic and defensive approaches which have proven to be somewhat ineffective, the Open Banking project gives the centre stage to consumers, putting them in charge of their digital data portfolio. The emergence of FinTech firms whose business model is based on providing information services to consumers will foster competition between banking providers, ultimately benefiting consumer welfare. In fact, if the CMA remedy holds its promise, it will lead to the widespread usage of money-management tools (helping consumers to manage and budget money across different accounts and banks), price-comparison and switching services (thereby preventing banks from exploiting consumer loyalty) and target provision of financial services from different players (allowing consumers to unbundle the one-stop-shop up to

now represented by many banking incumbents).[646] These developments are likely to level out, at least partially, the bargaining inequalities that have traditionally marked the relationship between financial entities and consumers.

If Open Banking holds its promise, financial inclusion is likely to improve over the coming years due to innovative financial services[647]. Digital footprints might provide information complementary to credit bureau data, thereby improving creditworthiness analysis. As a result, groups of individuals that used to be unbanked (i.e. without an account with a financial institution), as they did not fulfil eligibility criteria due to lack of information, would now have access to credit services. Financial inequalities and credit exclusion are set to decrease significantly, provided that FinTech innovation is able to deliver more accurate and less costly information analysis services.

However, the increasing digitalisation of transaction activities brought about by Open Banking also raises concerns for fragile consumers[648]. By engaging on a regular basis with PISPs and AISPs through their own mobile phones and other personal devices, consumers are inevitably set to leave in the infosphere increasingly significant digital footprints (i.e. the group of traces made from writing texts about oneself, financial information, social network data, websites registrations, political activity). Firms and financial providers enjoy access to customer information, thereby increasing even further the informative advantage over individuals, and the overall impact on consumer welfare is difficult to assess.

On the one hand, the systematic digitalisation of financial transactions raises risks of discrimination, manipulation and exploitation of vulnerable customers. Due to the lack of accountability and the high levels of opaqueness characterising algorithm-based decisions, consumers may be exposed to ambiguous and overly complex decision-making mechanisms. On the other hand, it has been argued that the additional information derived from applying big data analytics to users' digital footprints is not likely to dramatically change the current balance of bargaining powers between consumers and financial providers[649]. In fact, instead of opening the competitive battleground to new providers, access to new and more refined data may simply complement the current information background used for creditworthiness assessments.

[646] Basso, Bon, Tasker, Timan, Walker & Whitcombe (2018).
[647] See Vives (2017), 99, arguing that the main contribution of FinTech innovation is the substantial decrease of transaction costs and cost of capital in the realm of payment systems, insurance, financial advising, and lending.
[648] Berg, Burg, Gombović, and Puri (2020); Ferretti (2018).
[649] See also Vives (2017), noting that the main developments in the application of digital technology have occurred so far in lending, payment systems, financial advising, and insurance, because in all those segments of business FinTech has the potential to lower the cost of intermediation and broaden the access to finance increasing financial inclusion.

On top of this, facilitated forms of data sharing increase the exposure to risks of potential data breaches, abuses and frauds. Arguably, unauthorised third parties may exercise undue influences on consumers and service providers by taking advantage of data breaches and electronic frauds. Therefore, in order for demand-side interventions to be effective, customers need to be reassured about the security of their data and their ability to control how they will be used by third parties[650]. The European Commission and the European Banking Authority have acknowledged the need to effectively tackle the dynamic nature of cyber-risks, hence financial service and payment providers are expected to engage in stress test scenarios aimed at identifying innovative solutions on a continuous basis[651].

4.7 Data-driven empowerment in regulated markets: towards Open Finance

Regulatory interventions, such as the XS2A rule, which facilitates data sharing by empowering account holders to lower the incumbency advantage of banking institutions and level the playing field are crucial for promoting competition. Hence, it is worth investigating whether the Open Banking paradigm could be applied beyond payments and to other sectors so to improve consumers' bargaining power and engagement. This would allow customers to share their data across markets with different providers in a secure, ongoing and standardised format.

The UK has already committed to taking stock of this approach by triggering the debate on Open Finance[652]. This concept refers to the extension of third-party access and Open Banking-like data sharing mechanisms to a wider range of financial sectors and products (such as pensions, mortgages, savings, insurance, consumer credit, and investments). Moreover, building on the approach pioneered by Open Banking, the UK Government has launched a Smart Data review to investigate how to ensure that data portability is implemented in a way which supports consumers to get better deals in regulated markets.

The British government identified the following key features of Smart Data initiative: the immediate provision of data by the data holder to third party providers following a request from a consumer; the use of APIs to share data securely; an ongoing transfer of data between businesses and third party

[650] UK Competition and Markets Authority (2018a), 39-40.
[651] European Banking Authority (2019c); Commission Delegated Regulation (EU) 2018/389 of 27 November 2017 supplementing Directive (EU) 2015/2366 of the European Parliament and of the Council with regard to regulatory technical standards for strong customer authentication and common and secure open standards of communication [2018] OJ L 69/23, Recitals 1 and 2.
[652] See Financial Conduct Authority (2019b), setting up an external advisory group to drive forward the discussion about this new regulatory strategy. See also Bank of England (2019a), support the principles of Open Finance and proposing the creation of an open platform for small and medium-sized enterprises (SMEs) finance.

providers (rather than a one-off transfer); the adherence to common technical standards, data formats and definitions to ensure interoperability and to minimise barriers for third party providers; the provision of certain product and performance data, such as tariffs or geographical availability of services, in addition to consumer data, if necessary, to enable innovation[653].

In particular, the UK Government has announced the introduction of Smart Data initiatives in the energy and pensions markets. According to this plan, energy suppliers will be required to provide third parties with consumers' information, including their usage and tariff data. In the same vein, pension providers should make relevant information about consumers available via 'pensions dashboards', thereby allowing individuals to view all of their pension pots in a single location and compare alternative offers. Furthermore, the UK Government is set to launch 'Open Communications' initiatives which would require communications providers to share customer and product data, covering mobile, fixed phone, broadband and pay-tv services, including bundled services, to TPPs if requested by the consumer[654].

Smart Data projects are aimed to enable the emergence of new intermediaries and new business models that may challenge incumbents by offering new services to consumers. Such an ambitious goal requires to implement interoperability through a standardised approach to data sharing across a wide range of markets, starting from those where the penalty suffered by consumers that remain loyal to their existing suppliers is higher. The Bank of England suggested that the real gains will come from integrating government data sources, such as the passport office, the driver licensing agency, the department for works and pensions, and the payments and customs authority using the same APIs and standards: an Open Data platform that gave consumers the ability to compile their data instantly, from public and private sources, in a safe and permissioned manner, would unlock a truly smart data economy[655].

The UK Government already envisaged the following examples of new services enabled by Smart Data in regulated markets: utility management services that monitor a consumer's current household bills and usage and prompt them if better deals become available that match their preferences; services that use Open Banking data in conjunction with data from other markets, for instance utilities, to help those on irregular incomes understand their likely outgoings and better plan for the future; bill splitting services for multiple occupancy homes would make it easier to split utilities bills fairly between co-residents; automatic switching services that enable consumers to set their preferences and

[653] UK Government (2018), 11.
[654] UK Government (2020), 15.
[655] See Bank of England (2019a), 6-7.

let the service switch them automatically if a better deal appears; advanced comparison tools which allow consumers to find the best deal based on additional factors such as historical usage, location or service quality, and can compare prospective deals to the consumers' current deal; bundle management services which could help consumers understand what parts of the bundle they are using, whether they are paying for elements that they are not using and what appropriate alternative bundles are available[656].

In a similar vein, the European Union built on the PSD2 experience to adopt several new provisions giving consumers the power to manage their data. Namely, the GDPR introduced a general scope data portability right,[657] the Digital Content Directive allowed consumers to retrieve all content provided or generated through the use of the digital content,[658] the recast Electricity Directive allowed customers to retrieve their metering data or transmit them to another provider in order to take advantage of off-peak energy pricing and cheaper tariffs.[659] Furthermore, European institutions have enacted regulatory interventions to promote the free flow of non-personal data in the commercial arena[660] and the re-use of public sector information[661]. Finally, the Commission has recently announced a legislative action (Data Act) on issues that affect relations between actors in the data-agile economy to provide incentives for horizontal data sharing across sectors[662].

All these regulatory interventions share a common bottom-line, namely to ensure that consumers enjoy smooth access to data-enabled innovation so to make more informed choices. Rather than relying on old-fashioned information disclosure rules, which did not prove to be effective,[663] these innovation-friendly regulatory interventions harness new data-enabled services to make it easier for consumers to navigate retail markets[664].

However, actual consumers' response and willingness to embrace the potential of such measures will be crucial to determine the success of competition-sensitive data governance. For instance, recent data related to British consumers' perspectives in financial services suggest that most of them are reluctant to share data with providers other than their main bank, thereby slow downing the adoption

[656] See UK Government (2020) 13-14
[657] Regulation (EU) 2016/679, Article 20.
[658] Directive (EU) 2019/770 of the European Parliament and of the Council of 20 May 2019 on certain aspects concerning contracts for the supply of digital content and digital services, [2019] *OJ L 136/1, Article 16.*
[659] Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU, [2019] OJ L 158/125, Article 20.
[660] Regulation (EU) 2018/1807 on a framework for the free-flow of non-personal data in the European Union, (2018) OJ L 303/59.
[661] Directive (EU) 2019/1024 on open data and the re-use of public sector information, (2019) OJ L 172/56.
[662] European Commission, Communication 'A European strategy for data', COM(2020) 66 final, 13.
[663] UK Competition Network, 'Helping people get a better deal: Learning lessons about consumer facing remedies' (n. 3).
[664] UK Government (2018), 7.

of Open Banking. Based on recent empirical data, the FCA reported that only 3 in 10 consumers have ever switched current accounts but 44% of adults have more than one active current account; furthermore, 70% of account holders who have held their account for over three years have never switched provider and 35% said that nothing would encourage them to switch[665].

Previous studies found that reporting that 58% of current account holders are willing to share financial data from other providers with their main bank (compared with 12% who would be willing to share financial data with new banks) and 63% of retail customers are open to share financial data regarding their accounts with a competing FinTech firm in pursuit of a more efficient service or product[666]. Conversely, other sources reported that 77% of British adults would be concerned about sharing their financial data with companies other than their main bank. Further, only 28% are aware of the transition towards Open Banking currently taking place[667]. Lastly, Accenture found that 70% of customers is unwilling to share their bank account data with third party providers and 53% of the consumers is reluctant to change their existing banking habits[668]. Fraud is the primary obstacle to consumers embracing Open Banking, with 85% claiming increased risk of fraud as the biggest barrier to them sharing bank account information with third-party providers. Data protection risks and the potential for cyber-attacks or viruses were also noted as major concerns by those considering Open Banking, cited by 74% and 69% of consumers, respectively.

4.8 The case for a competition sensitive data governance

Consumer-facing remedies designed to enhance customer engagement are becoming topical in driving effective competition on the markets. Frictions in decision-making provided by human factors and the fact that consumers can be manipulated to take advantage of their behavioural biases have increasing effects on market outcomes since they render consumers sticky[669]. Hence, policy makers are increasingly turning to demand-side interventions to enhance competition by improving consumer engagement[670]. Indeed, while competition authorities often focus their efforts on ensuring that the supply side of a market is functioning competitively, a poorly-functioning demand-side of a market can increase the market power of suppliers and/or lead to competition occurring along dimensions that are less relevant to consumer welfare[671].

[665] See UK Financial Conduct Authority (2019), 19.
[666] See also Mintel (2019). See also Bain & Company (2018).
[667] YouGov (2018).
[668] Accenture (2017).
[669] Committee for the Study of Digital Platforms (2019), 19.
[670] Fletcher (2019).
[671] OECD (2018); UK Competition and Markets Authority (2018a).

Against this background, the rise of digital platforms provides opportunities for engaging consumers better[672]. As they can increasingly benefit from facilitated forms of distribution and decision-making, retail financial markets may tip towards efficient allocations of products and resources. Henceforth, to trigger such developments, the most far-reaching regulatory strategies are striving to smooth technological innovation and competition. Instead of playing catch-up on market failures by means of ex post remedies, policy makers have started to curb information asymmetries and the lack of consumer awareness by opening up the financial markets to real time data access and tailored comparison tools. In this regard, the introduction of access-to-account rules as well as API standardisation enshrined in the PSD2 and in the UK Open Banking project highlight the rise of a new regulatory paradigm strongly focused on consumer engagement.

These initiatives aim to transform the relationship of consumers with financial intermediaries. Moreover, their underlying rationales and principles could be applied beyond banking enabling consumers across markets to share their data with different providers in a secure, ongoing and standardised format[673].

Rather than just protecting fragile consumers, these regulatory interventions give individuals more control over their data and digital consumption choices, thereby implying a significant shift in the way in which policy makers conceptualise digital consumers[674]. Indeed, a well-functioning market requires consumers to be able to access the right information, to assess that information, and to act on their assessment in choosing products and providers[675]. Hence, problems emerging on the demand-side of the market may affect this process whereby consumers face searching and switching costs that can limit their ability to access information or act on it, whereby behavioural biases and the context of decisions can lead to mistakes by consumers, and whereby suppliers exploit and exacerbate these problems by making the information available more complicated, locking consumers into contracts, or exploiting biases.

However, some relevant drawbacks of the proposed data sharing regime cannot be disregarded and require to be tackled in order for Open Banking to deliver on its promises. In particular, the increasing digitalisation of financial transactions raises concerns about discrimination, manipulation and exploitation of vulnerable consumers. Indeed, lack of accountability and high levels of opaqueness characterising algorithm-based decisions may make consumers unable to properly exercise their

[672] See Bush (2020) for an analysis of procedural fairness in the relationships between platforms and their users.
[673] Fingleton (2018).
[674] Colangelo, Maggiolino (2018), 2.
[675] OECD (2018), 2.

effective choice[676]. Furthermore, there is a risk that those without access to the internet will not benefit from these types of intervention. Moreover, facilitated forms of data sharing increase the exposure to risks of cyber-attacks, data breaches and electronic frauds, which are rightly perceived as primary barriers to consumers considering Open Banking[677].

We are witnessing the rise of innovative business models and new sector-specific rules empowering consumers. This ambitious goal is pursued by means of regulatory interventions harnessing technology innovation in order to facilitate switching as well as to allow autonomous and independent decision-making regarding data management. Against this background, Open Banking stands out as an innovative way of fostering consumer engagement by leveraging on FinTech innovation. However, as data recently reported by the UK Financial Conduct Authority warn,[678] its success hinges on consumers' willingness to change their habits and embrace the digital revolution by making full use of the bargaining toolkit provided by regulators.

[676] UK Competition Network (2018).
[677] Accenture (2017).
[678] UK Financial Conduct Authority (2019).

II Section: The impact for competitive dynamics

4.9 The evolution of European data governance

In its recent Communication on a European strategy for data, the European Commission announced a new legislative measure (the Data Act) to provide incentives for horizontal data sharing across sectors.[679] The forthcoming act will represent a further regulatory intervention promoted by European institutions in regard to major data-related issues. Indeed, in recent years several regulations and directives have been enacted to allow third parties to obtain real-time data relating to customers' bank accounts,[680] to grant users a right to personal data portability,[681] to promote the free flow of non-personal data in business-to-business relationships[682] and the re-use of public sector information,[683] and to assist consumers' active participation in the electricity markets by benefiting from the deployment of smart metering systems.[684]

All these interventions share a similar pro-competitive rationale, i.e. to encourage competition by promoting access to data and facilitating data sharing and portability. Indeed, access to data is a crucial factor in unlocking competition and, according to the Commission, there are currently not enough data available for innovative re-use, while "businesses need a framework that allows them to start up, scale up, pool and use data, to innovate and compete or cooperate on fair terms." [685] Therefore, according to the Commission, data should be available to all, "whether public or private, big or small, start-up or giant. This will help society to get the most out of innovation and competition and ensure that everyone benefits from a digital dividend."[686]

Against this backdrop, to further enhance data access and use, with the Data Act the Commission is also evaluating the intellectual property rights framework and measures necessary to establish data pools for data analysis and machine learning.[687] Moreover, the Commission will consider how best

[679] European Commission, Communication 'A European strategy for data', COM(2020) 66 final, 13.
[680] Directive (EU) 2015/2366 on payment services in the internal market, [2015] OJ L 337/35, Articles 36 and 64-68.
[681] Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, [2016] OJ L 119/1, Article 20.
[682] Regulation (EU) 2018/1807 on a framework for the free-flow of non-personal data in the European Union, [2018] OJ L 303/59.
[683] Directive (EU) 2019/1024 on open data and the re-use of public sector information, [2019] OJ L 172/56.
[684] Directive (EU) 2019/944 on common rules for the internal market for electricity, [2019] OJ L 158/125.
[685] European Commission (2020a), 1 and 6.
[686] European Commission (2020a), 2.
[687] European Commission (2020), 8.

to address market imbalances in relation to data access and re-use.[688] Indeed, in its view, the contestability of markets is affected by the 'data advantage' achieved by a small number of online platforms which may exploit it to set the rules on the platform, unilaterally impose conditions for access and use of data, and leverage such advantage when developing new services and expanding into new markets.

However, several studies question the effectiveness of data portability in fostering market competition. Some commentators warn against the unintended competitive effects of the General Data Protection Regulation (GDPR), documenting that it has entrenched the market power of incumbents.[689] Similar concerns have been expressed about the entry of BigTech platforms into retail banking as a result of the access to account (XS2A) rule introduced by the revised EU Payment Service Directive (PSD2).[690] Indeed, by harnessing the massive quantities of data generated by their networks and benefiting from access to payment account information enabled by the PSD2, large technology companies may disrupt retail banking markets. The fear is that BigTechs, following the "move fast and break things" motto, could rapidly monopolize the market for financial services by combining different types of financial and non-financial services, and engaging in self-preferencing, i.e. giving preferential treatment to their own products and services compared to those provided by incumbents and start-ups.[691]

Concerns have been raised on the other side of the Atlantic as well. In October 2019, it was introduced before the House of Representatives a Bill whose title is self-explanatory ("Keep Big Tech out of Finance Act").[692] If enacted, the Bill would prohibit technology companies that have an annual global revenue of over twenty-five billion dollars from either acting as a financial institution or being affiliated with a financial institution. Additionally, the Bill would ban BigTechs from establishing, maintaining or operating a digital asset that is intended to be widely used as medium of exchange, unit of account, store of value, or any other similar function, thus effectively banning virtual currencies.

[688] European Commission (2020a), 8.
[689] See Batikas, Bechtold, Kretschmer, and Peukert (2020). In the same vein, Gal and Aviv (2020); Geradin, Karanikioti and Katsifis (2020); Johnson and Shriver (2020). See also Lam and Liu (2020), arguing that data portability may hinder switching and entry due to the demand-expansion effect where the prospect of easier switching due to data portability may induce consumers to provide even more data to the incumbent, hence strengthening the incumbency advantage. See also Bessen, Impink, Reichensperger, and Seamans (2020), analyzing how the GDPR may negatively impact firms that need data to develop AI products.
[690] See Borgogno and Colangelo (2020); Di Porto and Ghidini (2020); Vives (2019b); De la Mano and Padilla (2018).
[691] Crémer, De Montjoye, and Schweitzer (2019); Expert Group on Regulatory Obstacles to Financial Innovation (2019), 79-80.
[692] U.S. Congress 116th (2020).

The aim of the following sections is to investigate the potential competitive effects of the emergence of platform business models in finance, and in particular to assess whether it would be reasonable to target BigTechs' data power over incumbent banks, after having addressed with the XS2A rule the data power of the latter over FinTechs.

4.10 The pro-competitive aim of European legislation

The PSD2 is intended to promote competition that exploits technology-enabled solutions provided by FinTechs. Indeed, the retail-banking sector has traditionally been affected by low elasticity of demand, consumer adherence, and lock-in problems whereby banks can extract supra-competitive profits to the detriment of consumer welfare.[693]

The first Payment Service Directive (PSD) enhanced competitive dynamics by providing specific single licenses for payment operators, harmonized market access requirements, and a common technical infrastructure enabling the provision of by third party providers (TPPs).[694] As seen, within this legal framework, banking incumbents were free to turn down applications by TPPs to access their infrastructure and their customer data. Although such refusal was clearly due to competitive concerns, banks could justify it by citing intellectual property protection, security risks, as well as liability and reputational concerns. Accordingly, customers who had unilaterally decided to provide account data access to TPPs would have violated the contractual terms with the bank. thereby running substantial liability risks.

Against this backdrop, the rise of technological innovation applied to financial and banking services provides a remarkable opportunity to remedy bargaining power unbalances between incumbents and consumers.[695] Indeed, FinTech is intended to facilitate digital interactions and data flows between users and firms, thereby enabling access to finance through new means and at a lower cost.[696] Further, FinTech-enabled products, such as price-comparison tools and eased interoperability, can significantly mitigate consumers' unwillingness and inability to engage with service providers and prompt them to look actively for the most convenient offers.

As illustrated in chapter 3, the XS2A rule enshrined in the PSD2 was designed to harness this potential of FinTech. In compliance with this rule, account servicing payment service providers (especially

[693] See eg Australian Government Productivity Commission (2018); UK Competition and Markets Authority (2017); The Netherlands Authority for Consumers & Markets (2014).
[694] Directive 2007/64/EC on payment services in the internal market, [2007] OJ L319/1.
[695] European Commission (2018e), 8. See also Borgogno and Colangelo (2020b).
[696] UK Competition and Markets Authority (2018).

commercial banks) allow TPPs to access real-time data on users' accounts as well as provide access to such accounts by executing payment orders initiated via payment initiation service providers interfaces, provided that the account is accessible online and the customer has given his/her explicit consent. Accordingly, by strengthening users' control over their transaction data in order to allow TPPs to process such data or initiate payment orders, European policy makers intended to reinvigorate competitive dynamics.

From a competition policy perspective, the PSD2 shares the purpose of the data portability right introduced with the GDPR, i.e. to trigger and foster inter-platform competition by decreasing the transaction costs incurred by consumers. Indeed, a consequence of the control over personal data ensured by the GDPR is the stronger bargaining position enjoyed by individuals vis-à-vis online service providers. Similarly, the PSD2 encourages consumers to shop around by providing easy access to their accounts and transaction data in order to benefit from new services or better deals. Overall, the GDPR and the PSD2 can be regarded as the building blocks of the recent European regulatory strategy aimed at opening up retail markets and sustaining consumer activity and engagement in the digital landscape.

Furthermore, as regards retail financial markets, the PSD2 is supposed to lay the foundations for open banking, that is, a new business environment characterized by increased interoperability between service providers and smooth data flows enabling lively competition to the benefit of consumers.[697] Within such an ecosystem, firms and individuals can enjoy simultaneously and frictionlessly services and products offered by different providers. By means of a single digital interface, users can manage payment accounts together with other products like mortgages, pensions and investments.[698] Open banking hinges on a new competitive paradigm which has been increasingly embraced by policy makers around the world.[699]

However, although the PSD2 has been conceived to create new opportunities for FinTechs, the XS2A rule may also favor the entry of BigTechs. Actually, the competitive impact of BigTech companies may be greater than that of FinTechs. Indeed, the latter face some competitive disadvantages vis-à-vis incumbent banks in terms of compliance costs, limited access to soft information about potential customers, brand recognition, lack of reputation and a relatively high cost of capital.[700] As a result, the relationship between banks and FinTechs is likely to end up being largely cooperative and

[697] European Commission (2020), 30.
[698] Euro Banking Association (2017); UK Open Banking Working Group (2016).
[699] See eg Australian Competition and Consumer Commission (2020); Government of Canada (2019); UK Competition and Markets Authority (2018); Mexican Parliament (2018); Japanese Parliament (2016).
[700] See Zernik (2020); Stulz (2019).

complementary in nature.[701] Similarly, banks show willingness to interact with FinTechs as service providers, avoiding expensive and sophisticated integration efforts.[702]

Unlike FinTechs, BigTech firms already enjoy reputation, established networks, large installed customer bases, considerable earnings, powerful brands and unfettered access to capital markets. On top of all this, as pointed out in chapter 1, they can leverage proprietary data silos derived from their non-financial-service operations to provide consumers with tailored offers. Furthermore, they have access to the analytical skills and the most advanced technologies (including artificial intelligence, cloud computing, and machine learning) with which to process transaction and consumer data so as to get the most out of their resources. Because of these factors, BigTech firms could scale-up in financial markets very quickly, thereby posing a significant competitive threat to traditional banking.

4.11 Addressing the entry of BigTechs in the financial industry

The entry of large digital platforms into the financial sector magnifies both the benefits provided and the concerns raised by FinTech companies.[703] On the one hand, drawing on their leadership in big data analytics as well as on digital services and infrastructure, BigTechs may further increase competitive pressure on the incumbent side. In turn, this is likely to stimulate responses from the incumbent side, ultimately improving consumer welfare and financial inclusion. On the other hand, the disruption evidenced by other industries because of BigTechs entry might have major consequences on financial markets in terms of financial stability. Indeed, commercial banks would face reduced profits and be driven out of the market. And, at the same time, the economic features that make digital markets highly concentrated may exacerbate 'too big to fail' concerns because an idiosyncratic shock hitting a BigTech can negatively impact on the entire system. Furthermore, from a consumer protection perspective, the systematic digitalization of financial transactions is set to raise risks of discrimination and exploitation of vulnerable customers.

Finally, in addition to financial stability and systemic risks, the entry of BigTechs into the provision of financial services also raises significant antitrust concerns. First, the presence of extreme indirect network effects, strong economies of scale, and significant economies of scope due to the role of data

[701] Cole, Cumming, and Taylor (2019); Financial Stability Board (2019b); Bömer and Hannes (2018). See also Enriques and Ringe (2020), noting that FinTech firms, once seen as disruptors of the traditional banking world, are increasingly seen as attractive partners for established financial institutions.
[702] Drasch, Schweizer, and Urbach (2018). See also J. Cardenas, (2020), 7, noting that banks are increasingly collaborating with early-stage FinTech startups through incubator and accelerator programs (including Barclays Accelerator, Citi Ventures FinTech Accelerator, Deutsche Bank Innovation Labs and Goldman Sachs Accelerate), as well as through corporate venture capital investment.
[703] Claessens, Frost, Turner, and Zhu (2018).

as a key input may make retail financial markets even more concentrated, not easily contestable and prone to tipping. Second, digital platforms are in the position to leverage their data advantage in downstream or conglomerate markets, attaining significant portfolio effects.[704] Indeed, large online companies can harness their analytical tools and skills in processing and cross-referencing the data at their disposal to offer a vast array of tailored products and mutually integrated services. Specifically, BigTechs can make full use of data access mechanisms in order to strengthen their business potential even further. Therefore, nothing prevents them from replicating anti-competitive strategies in financial markets to the detriment of incumbents and small new entrants. In particular, they can do so by engaging in self-preferencing, bundling new products with traditional services, or discriminating traditional incumbents when accessing to their platforms.

On this view, BigTechs are likely to increase competition mainly in the short term.[705] However, if history repeats itself, once large digital platforms have entered industries with long vertical value chains, like the banking sector, they will leverage their competitive advantage arising from data and network effects to extend their dominance to other layers of business. This result would be achieved by vertically integrating and self-favoring their own products and services.[706] In sum, banks run the risk of being enveloped by BigTech platforms, which may harness the network effects that previously had protected the incumbent by assembling much of the information the customer's bank or asset manager possesses, and supplementing it with their very detailed knowledge of many other aspects of the customer's choices and preferences.[707]

For these reasons, we are witnessing a widespread concern that antitrust law has been an insufficient constraint on the conduct of large digital platforms. In addition to the aforementioned economic features which make digital markets highly concentrated and incumbent platforms hard to dislodge, several reports issued over the past year by authorities, policy makers and academics have pointed to the gatekeeper status of BigTechs and to their dual role.[708] According to this view, large digital

[704] Bank of International Settlements (2019a).
[705] de la Mano and Padilla (n 12) 498; Vives (n 12) 259.
[706] According to de la Mano and Padilla (2018) 498 and 509, BigTechs may succeed in monopolizing the origination and distribution of loans to consumers and SMEs, forcing legacy banks to merely fund loans intermediated by BigTechs accepting deposits from the public and investing them in products originated and distributed by others.
[707] See Eisenmann, Parker, and Van Alstyne (2011), describing the platform envelopment strategy by referring to the entry of a platform with market power in an origin market into another platform's market (the target market): according to this strategy, by combining its own functionality with that of the target in a multi-platform bundle that leverages shared user relationships, the enveloper captures market share by foreclosing an incumbent's access to users and harnesses the network effects that previously had protected the incumbent.
[708] See Australian Competition and Consumer Commission (2019); Belgian Competition Authority, Dutch Authority for Consumers & Markets, and Luxembourg Conseil de la Concurrence (2019); Crémer, de Montjoye, and Schweitzer (2019); French Competition Authority (2020); German Commission 'Competition Law 4.0' (2019); Stigler Committee for the Study of Digital Platforms, Market Structure and Antitrust Subcommittee (2019); UK Competition and Markets Authority (2020); UK Digital Competition Expert Panel (2019).

platforms act as gatekeepers and regulators due to their rule-setting role within the ecosystem. This situation is perceived as particularly threatening whenever BigTechs perform a dual role, acting as both an intermediary and a business operating on the platform, because in such circumstances they may have the incentive to discriminate to their own benefit.

As a result, almost all the reports point to the inefficiency of relying solely on *ex post* antitrust enforcement and call for a possible *ex ante* regulatory framework to complement antitrust rules in addressing competition issues in digital contexts. Indeed, digital markets would move too fast to be supervised *ex post*. In "Shaping Europe's digital future", the Commission announced the launch of a sector inquiry to evaluate the effectiveness of the current competition rules and to explore whether *ex ante* regulatory responses might be needed to ensure market contestability against gatekeeping platforms.[709]

According to the inception impact assessment, the adoption of an *ex ante* regulatory framework for large online platforms acting as gatekeepers would include two sub-options.[710] The first option would introduce a prohibition or restriction of certain unfair trading practices (blacklisted practices), such as certain forms of self-preferencing and the acceptance of supplementary commercial conditions that by their nature have no connection with the underlying contractual relationship. The second pillar of a new *ex ante* regulatory framework would also include tailor-made remedies covering specific issues and individual large online platform companies, and applied on a flexible, case-by-case basis. These remedies would be adopted and enforced by a competent regulatory body and could include platform-specific non-personal data access obligations, specific requirements regarding personal data portability, or interoperability requirements.

In the same vein, with regard to banking and financial markets, the Expert Group on Regulatory Obstacles to Financial Innovation has recommended the introduction of *ex ante* rules to prevent large, vertically integrated platforms from discriminating against product and service provision by third parties.[711] In particular, the Expert Group listed three main scenarios, referring to: a) large technology companies with access to significant social media, search history and other data, leveraging their preferential data access to enter the market for financial services and benefiting from access to payment account information, as facilitated pursuant to the PSD2; b) providers of smartphone operating systems not providing access to the relevant devices' interface for competing payment applications; and c) providers giving access to devices or software under conditions that can create

[709] European Commission (2020a) 10.
[710] European Commission (2020c).
[711] Expert Group on Regulatory Obstacles to Financial Innovation (2019), 79-80.

inefficiencies, such prohibiting the use of other consumer interfaces or demoting rivals' financial products and services in search engine results.

In this last case, the Expert Group is clearly referring to the seven-year-long *Google Shopping* European investigation, which provides an outstanding example of how complex and burdensome the antitrust enforcement can be when it comes to behaviours in which vertically integrated platforms engage.[712] The European Commission found that a discriminatory treatment of rivals by a vertically integrated search engine may amount to an abuse of dominant position if the search engine gives an advantage to its own comparison shopping service by systematically ensuring a prominent placement to it and demoting rival comparison shopping services in its search results. While awaiting the General Court judgement,[713] a lively debate has arisen on the possibility of assessing such conduct under one of the established categories of abuse.[714]

Finally, it is worth mentioning that Germany is paving the way for new rules allowing e-money issuers and mobile payment service providers to access platform-based technical infrastructure. Namely, Section 58a of the German Payment Services Supervisory Act provides them with a right to access the functionalities of the operating systems of online devices and the respective near-field communication (NFC) interface technical infrastructure integrated in mobile phones and other devices. Access should be granted on reasonable terms and at a fair price, but it is not clear whether it must be direct or through a dedicated interface.[715]

In its very essence, such an *ex ante* regulatory intervention imposes on BigTechs a duty to share their market ecosystem with potential competitors in the field of payment services.[716] The rule has been labeled "Lex Apple Pay" as it is set to impact especially Apple's proprietary business model. As the firm's NFC interface can only be accessed via Apple Pay, payment service providers cannot integrate their own payment solutions into the iPhone's NFC system without paying onboarding and transaction fees for using the Apple Pay App. The provision aims to unbundle the market for stationary hardware from software applications running on them, counterbalancing the gatekeeper position and the network effects enjoyed by digital enterprises operating large platforms which could have allowed them to quickly monopolize the market for payment services, also by means of self-

[712] Case AT.39740 (2017), *Google Search (shopping)*.
[713] Case T-612/17, *Google and Alphabet v. Commission*.
[714] See eg Dunne (2020); Colomo (2019); Akman (2017).
[715] Interestingly, shortly before the entry into force of Section 58a in January 2020, 371 out of 379 Germans savings banks agreed to use Apple Pay, foregoing the option of direct access to the NFC interface through their own apps: see Brady (2019).
[716] See Franck and Linardatos (2020), arguing that this new right can be regarded as an attempt to push forward the pro-competitive objective underlying XS2A rule enshrined in the PSD2.

preferencing. In fact, the right at issue applies only when the hardware-based infrastructure is used to execute e-money transactions or to provide payment services.

The provision affects the business behaviours of firms producing Internet of Things devices (such as voice control systems, cars, smartphones, cars, and so on), but not account information service providers or payment initiation services providers under the PSD2 framework as they do not operate proprietary infrastructure. Furthermore, according to the de minimis exception enshrined in Section 58a(2) PSSA, the access rule is triggered only if, at the time of the request, the technical infrastructure is deployed by more than ten payment service providers or e-money issuers or the firm operating the infrastructure enjoys more than two million users. This regulatory mechanism is clearly designed to keep operators enjoying tight proximity to users from leveraging their position and getting full control of front-end customer interaction to the detriment of potential competitors.

The European Commission has decided to look into these practices opening a formal antitrust investigation concerning Apple's terms, conditions and other measures for integrating Apple Pay in merchant apps and websites on iPhones and iPads, Apple's limitation of access to the NFC functionality ("tap and go") on iPhones for payments in stores, and alleged refusals of access to Apple Pay for specific products of rivals on iOS and iPadOS smart mobile devices.[717]

4.12 A critical assessment of the European proposal for a Digital Markets Act

The inception impact assessments released by the European Commission with regards an *ex ante* regulatory framework for large online platforms acting as gatekeepers[718] and a new competition tool[719] provide further food for thoughts. Indeed, among the several policy options on the table, these interventions may blacklist certain forms of self-preferencing and may allow interventions in tipping markets and in markets displaying systemic failures due to certain structural features, such as high concentration, entry barriers, consumer lock-in, lack of access to data or data accumulation.

However, doubts about definitions and thresholds which would trigger these measures cannot be overlooked. The very definition of gatekeepers is indeed vague. This subset of online platforms would be identified on the basis of criteria, such as significant network effects, the size of the user base, and the ability to leverage data across markets, whose relevance will be explored in the impact

[717] European Commission (2020e).
[718] European Commission (2020c).
[719] European Commission (2020d).

assessment.[720] Further, it is not surprising that increasing economic power of large digital platforms has pushed the European legislators to gauge how to overhaul the competition policy toolbox.

Notably, the European Commission published an open public consultation on the need for a possible new (market investigation) competition tool that would allow addressing structural competition problems in a timely and effective manner.[721] In particular, the new tool was expected to allow the Commission to impose behavioral and, where appropriate, structural remedies. Following the British example of market investigation[722], this would allow the European Commission to envisage semi-regulatory interventions to address structural competitive problem affecting specific markets. If implemented, the proposal would consolidate the ability of the European policy maker to design new and more sophisticate pro-competitive regulatory initiatives than the one adopted with the PSD2.

According to the inception impact assessment, four policy options were considered. The first two would address unilateral conduct by dominant companies either across all sectors or in specific sectors, such as digital markets. The other two policy options would include a market structure-based tool, thereby not limited to dominant companies, allowing the Commission to intervene when a structural risk for competition or a structural lack of competition prevents the market from functioning properly. Structural risks for competition refer to tipping markets, i.e. scenarios where certain market characteristics (eg network and scale effects, lack of multi-homing and lock-in effects) and the conduct of the companies with an entrenched market and/or gatekeeper position create a threat for competition. Structural lack of competition refers instead to a structural market failure, ie scenarios where markets display systemic failures due to certain structural features (eg high concentration and entry barriers, consumer lock-in, lack of access to data or data accumulation) and oligopolistic market structures with an increased risk for tacit collusion.

On December 15, 2020 the European Commission finally presented a Proposal for a regulation "on contestable and fair markets in the digital sector" (Digital Market Act).[723] As the proposal is based on article 114 TFEU (internal market), it will now follow the ordinary legislative procedure where the European Parliament and the Council co-legislate and take the lead. Since the legal form chosen is that of a Regulation under article 2888 TFEU, there will be no need for Member States to take any implementing acts once the Regulation enters into force.

[720] European Commission (2020c).
[721] European Commission (2020d).
[722] See section 4.5.
[723] European Commission (2020b).

Such new piece of legislation is not aimed at financial markets and FinTech innovation, but it is worth of attention as it will influence the conduct of digital gatekeepers across the economy. The aim of the proposal is to increase fairness and contestability across digital markets within the EU. Pursuant to recital 10, this objective is distinct from the goal pursued by antitrust law, meant as the protection of undistorted competition on the market. As the legal form selected by the Commission is a Regulation enacting a full harmonization measure, Member States are precluded from applying further obligations to gatekeepers for the purpose of ensuring contestable and fair markets. Nevertheless, Member States are free to enact new legislation pursuing other legitimate public goals which may interfere in practical terms with EU law. This could reflect in legal uncertainty and unpredictability as some Member States (such as Germany) are envisaging national legislation constraining digital platforms.[724]

A key pillar of the Digital Market Act is the "gatekeeper" concept as a large pile of new obligation applies only to such firms. Under the proposal, a gatekeeper is characterized by the following elements. First, it is a provider of a "core platform service". Second, the Commission has formally qualified it as a gatekeeper by a decision.[725] Third, the platform offers a wide range of services including online intermediation services (i.e. app stores, marketplaces, etc.); online social networking services; online search engines; number-independent interpersonal communication services; video-sharing platform services; operating systems; cloud computing services; and advertising services (including ad intermediation).[726]

Any firms offering "core platform service" can be appointed as gatekeeper by the Commission if it fulfills three overarching qualitative requirements.[727] First, its service is an important gateway for business users to reach end users. Second, it has a significant impact on the internal market. Third, it enjoys (or is foreseeable it will enjoy in the near future) an entrenched and durable position in its operations. Further, such criteria are automatically met by way of a legal presumption if certain quantitative thresholds are met.[728] Firms meeting these criteria are under the duty to notify the Commission. By doing that, they can try to demonstrate that the qualitative requirements are not met.

[724] Chazan, Espinoza (2020).
[725] Digital Market Act, Article 1(1).
[726] Note that additional digital services may be added to the list.
[727] Digital Market Act, Article 3(1).
[728] Digital Market Act, Article 3(2). Namely, the group to which it belongs reaches a certain annual EEA turnover (EUR 6.5 billion) / market capitalization or fair market value (EUR 65 billion), and in addition the provider offers the core platform service in at least three Member States (this corresponds to the "significant impact on the internal market" element); and the core platform service has more than 45 million monthly active end users in the EU and more than 10 000 yearly active business users in the EU in the last financial year (this corresponds to the "important gateway" element); and the thresholds mentioned above for end users/business users were met in each of the last three financial years (this corresponds to the "entrenched and durable position").

Ultimately, the final decision whether to consider a provider a gatekeeper is on the Commission which will consider the user lock-in effect, the scale and scope effects as well as the entry barriers. Moreover, the Commission would review the conditions of gatekeepers.

If a firm has been formally designated as gatekeeper, it shall abide with additional obligations set forth in the Digital Market Act by a six-month time span. Such duties are designed by the Commission in order to prohibit unfair practices or conducts that could endanger contestability of markets.[729] The Commission is likely to engage in a regulatory dialogue with each gatekeeper in order to design tailored obligations on each specific firm's business methods.[730]

Contrary to initial expectations, in the Digital Market Act proposed by the Commission there is no the so-called New Competition Tool. Instead, the Commission will be empowered to run market investigations aimed at designating as gatekeepers providers that do not meet the quantitative thresholds.[731] Further, by way of it, the Commission can remedy systematic non-compliance[732] and adding new services to the list of "core platform services" or new practices that should be prohibited by the DMA.[733] Other obligations cover the duty to notify in advance the Commission of intended acquisitions[734] (but this does not trigger the Merger Regulation[735]) and an obligation to submit an independently audited description of any techniques for profiling of consumers.[736]

Interestingly, under the proposed Digital Market Act, the Commission could address competitive threats posed by emerging gatekeepers by imposing on them only a subset of the obligations.[737] Such firms are meant as those that will foreseeably have a durable and entrenched market gatekeeper position over the next future.

[729] Digital Market Act, Articles 5-6. Examples include: an obligation to have data silos (Article 5(a)), a potential prohibition of wide MFN clauses (Article 5(b)), an obligation to allow business users to promote offers to end users acquired through the core platform service (Article 5(c) – this could have major implications for Apple's App Store); a potential obligation to allow the installation and effective use of third-party app stores (Article 6(1)(c) – this could again have major implications for Apple); a prohibition from using non-public data generated from business users in competition with them (Article 6(1)(a) – this echoes the Amazon investigation); a prohibition of self-preferencing in rankings (Article 6(1)(d) this echoes the Google Shopping case); an obligation to apply FRAND conditions of access to app stores (Article 6(1)(k)) – according to the recitals this includes pricing conditions); and some very far-reaching obligations for providing data portability/interoperability (Article 6(1)(h)).
[730] According to Digital Market Act, Article 7, the Commission may by decision select the measure the gatekeeper should implement to comply with the obligations laid down in Article 6.
[731] Digital Market Act, Article 15.
[732] Digital Market Act, Article 16.
[733] Digital Market Act, Article 17.
[734] Digital Market Act, Article 12.
[735] Council Regulation (EC) No 139/2004 on the control of concentrations between undertakings (the EC Merger Regulation), (2004) OJ L 24/1.
[736] Digital Market Act, Article 13.
[737] Digital Market Act, Article 15(4).

Moving to the enforcement side of the Digital Market Act, a prominent position is enjoyed by the European Commission. Conversely, national authorities are expected to assist the Commission (by means of a Digital Markets Advisory Committee) and keep overseeing local market so to spot in advance any competitive threat. The Commission will have extensive investigative powers[738] and will be able to impose fines and periodic penalty payments in case of non-compliance of the same magnitude as in antitrust cases (up to 10% of annual turnover / 5% of daily turnover for fines and periodic penalty payments respectively).[739]

Following a market investigation where the Commission found that systematic non-compliance further strengthened or extended the gatekeeper's position, the enforcer could impose behavioral or even structural remedies (including divestiture) on the gatekeeper at stake.[740] Contrary to initial expectations, structural remedies are the last resort measure and can be imposed only if there are no equally effective behavioral actions to be undertaken. The Commission may also issue interim measures and accept commitments offered by the gatekeeper.[741]

In light of this overview, the enforcement system envisaged by the European Commission is undoubtedly comprehensive and incisive.[742] Since this piece of legislation is not expected to focus specifically on FinTech markets and it is still at a very early stage of legislative discussion, it is not possible here to carry out an in-depth analysis. What needs to be highlighted, however, is the willingness of European policy makers to address competitive distortions by means of new regulatory and enforcement tools. This attitude could speed up the development of new data sharing regulatory initiatives as well as new interventions in financial markets.

4.13 Asymmetric regulation and the risk of a regulatory backfire

As already pointed out in chapter 3, the access-to-account rule envisaged in the PSD2 is one of the most significant steps in the overall European data strategy. By promoting access to data and facilitating data sharing and portability, all the regulatory interventions adopted therein reflect the idea that the antitrust enforcement toolbox is inadequate to tackle effectively the need to ensure access to data.[743] And the European Commission has recently confirmed this approach by announcing a

[738] Digital Market Act, Articles 19-21.
[739] Digital Market Act, Articles 26-27.
[740] Digital Market Act, Article 16
[741] Digital Market Act, Articles 22-23.
[742] Geradin (2020).
[743] Borgogno and Colangelo (2020). See also Parker, Petropoulos, and Van Alstyne (2020), looking at the financial regulation as a model for addressing the market design for data sharing.

further legislative measure (Data Act) to provide incentives for horizontal data sharing across sectors.[744]

However, some studies are reporting a regulatory backfire, noting that these actions are strengthening the competitive advantage of large digital platforms, rather than fostering market competition.[745] In the case at issue, significant concerns have been raised about the entry of BigTechs into financial services as a result of the XS2A introduced by the PSD2.

Against this background and despite these unintended competitive effects, the strategic option advanced by policy makers is to intervene with further regulatory measures, namely introducing *ad hoc* provisions to prevent anti-competitive practices by BigTech platforms, instead of relying on antitrust law to oversee the digital transition of financial markets boosted by the PSD2. Furthermore, in Germany a new proposal has surfaced to limit access rights for digital conglomerates and undertakings identified by antitrust authorities as playing a pivotal role for competition. For instance, it has been suggested that the German Federal Cartel Office should be entrusted with the task of denying access and entry into the payment market for digital conglomerates. Such new ex ante control mechanism builds on the 24 January 2020 draft bill of the tenth amendment to the German Act Against Restraints of Competition (GWB-Draft) requiring "undertakings of paramount importance for competition across markets" to refrain from specific conducts unless they can provide efficiency justifications.[746]

Moreover, questioning whether a one-size-fits-all XS2A rule is well-suited and proportionate for both startups and BigTechs, some incumbents and commentators propose to complement this rule with a reciprocity obligation between BigTechs and banks[747]: if the beneficiary is a large digital company, the XS2A rule should be integrated with a corresponding right of the bank to access BigTech data that may equally be used to enhance digital payment services.

Advocates of this proposal argue that it would enhance competition and contribute to fostering financial stability by curbing moral hazard and adverse selection problems. Otherwise, if BigTechs adopted an originate-and-distribute model, they would have incentives to decrease the quality of the loan pool in order to maximize volume and/or bundling practices. Similarly, if BigTech platforms were to enact an agency model, thereby making money on fees and not retaining the loan originated,

[744] European Commission (2020).
[745] Bank of International Settlements (2019) 67.
[746] See Hoffmann (2020).
[747] de la Mano and Padilla (2018) 503 and 514; Di Porto and Ghidini (2019). In 2018 Ana Botín, executive chairman of Santander, voiced a similar call for a data access regime in favor of retail banks: see Nicholas Megaw and Rochelle Toplensky, 'Santander chair calls EU rules on payments unfair', (2018) *Financial Times*, 17 April https://www.ft.com/content/d9f819f2-3f39-11e8-b7e0-52972418fec4 accessed 8 April 2020.

they would end up brokering as many loans as possible and shifting default risks to traditional banks. However, the challenge is how to limit the data that should be subject to this new rule of access. Indeed, while accounts information under the XS2A rule is clearly identifiable and is arguably essential for providing data-enabled services, the entire set of behavioral data held by platforms are not essential as such for banks; nor do BigTechs enjoy monopoly power in their generation and collection.

All the aforementioned proposals share the view that to ensure a level playing field among different players in financial services, now that the XS2A rule has addressed the data power of incumbent banks over FinTechs, it is time to target BigTechs' data power over incumbent banks by introducing another asymmetric regulation.[748] As a result, the regulatory pendulum would swing back and forth.

It is not clear how the regulatory responsibility of digital platforms should be reconciled with the concept of special responsibility of dominant firms. By mentioning the telecoms regulatory framework as a source of inspiration for *ex ante* interventions, the European Commission seems to envision asymmetrical regulatory constraints to players designated as having "significant market power."[749] Pursuant to the European Electronic Communications Code, this designation would require the satisfaction of a 'three criteria test', which includes the presence of high and non–transitory barriers to entry, a market structure which does not tend towards effective competition within the relevant time horizon of the market analysis, and the insufficiency of competition law alone to address adequately the market.[750]

Same concerns emerge about the definition of tipping markets, ie markets that have not yet tipped but are prone to tipping, since they are apparently defined just referring to certain characteristics (eg network and scale effects, lack of multi-homing and lock-in effects) and the presence of companies with a gatekeeping position.[751] Moreover, it is not clear how the new competition tool will interact with existing regulations (eg PSD2), current antitrust provisions and the new *ex ante* regulatory framework for gatekeeping platforms proposed by the same European Commission.

[748] See de la Mano and Padilla (2018) 513, arguing that, although data portability obligations such as those imposed on banks in the EU (PSD2) or in the UK (Open Banking) do help to level the playing field, these asymmetric regulations are insufficient and are likely to prove detrimental unless they are complemented with other measures targeted on the data power of BigTech firms.
[749] European Commission (2020d). See also UK Digital Competition Expert Panel (2019) 81.
[750] Directive (EU) 2018/1972, establishing the European Electronic Communications Code, [2018] OJ L 321/36, Articles 63 and 67.
[751] Conversely, see Petit (2020), focusing on "tipped" markets by proposing a stricter antitrust regime toward them and a moderate antitrust regime toward the leveraging of market power in untipped markets.

Nonetheless, it is worth reminding that, in the banking sector, gatekeepers are apparently represented by financial institutions, rather than BigTechs. Indeed, because information is a key input to compete in financial services, as keepers of customers' finances, banks play a gateway role that is crucial to promote innovation and competition in the market. Therefore, we are concerned that, by adopting *ex ante* prohibitions against so-called digital gatekeepers, the European Commission runs the risk of missing the forest for the trees.

Because regulation significantly affects innovation, competition and consumer welfare, policy makers ought to be aware of the trade-offs embedded in different approaches. Tackling the increasing pace of technological development to provide financial services, policy makers have essentially to choose between a *laissez-faire* and a functional regulatory strategy. While under the former option firms are free to make use of information technology innovation within the ordinary regulatory framework, a functional approach requires that the same regulation should apply whenever economic activities raise same risks, regardless of whether the activities are led by an incumbent bank, a FinTech or a BigTech. The latter has been widely adopted by regulators throughout the world and recently embraced by the Expert Group on Regulatory Obstacles to Financial Innovation with the goal of ensuring a level playing field and curbing arbitrage opportunities and elusion.[752]

As matters stand, it is not yet possible to predict if BigTechs are going to disrupt retail banking markets. At present, we are still witnessing individual and cautious attempts by certain technology companies to provide specific additional services to their platform users.[753] At the same time, it is becoming evident that FinTech start-ups are set to cooperate, rather than compete, with incumbent banking players. As said above, bank-FinTech ecosystems allow new entrants and incumbents to complement each other's offers because the latter would acquire ready-made innovative solutions to improve their business activity, while the former would piggyback on them in order to meet the heavy regulatory compliance costs applying to financial institutions.[754]

Whether this complementarity ends up in cooperation or full-fledged integration between large incumbent banks and FinTech start-ups, we are still halfway to achieving the pro-competitive goal underlying data access regulatory regimes. In fact, PSD2 was designed by policy makers to serve the purpose of creating a more competitive retail banking environment able to deliver lower prices and better quality to consumers. Against this context, if new *ex ante* asymmetric regulation were

[752] Expert Group on Regulatory Obstacles to Financial Innovation (2019) 67-68.
[753] See Megaw (2019) noting that the growth of loans originated by Amazon Lending, for instance, has slowed significantly over the last three years, according to the company's most recent annual report.
[754] Many traditional banks, such as HSBC in the UK, Intesa San Paolo in Italy and BBVA in the U.S., are setting up their own application programming interface (API) infrastructure to implement effectively banking-as-a-platform business models.

introduced as a containment measure specifically aimed at shielding traditional banks from BigTechs' competitive pressure, a twofold problem would arise.

First, innovations and efficiencies likely to be brought by platforms would be jeopardized, thereby preventing the surface of new products and services beneficial to consumers (in terms of financial inclusion, customer experience, better management of monetary resources, etc.). Indeed, such a form of regulation would asymmetrically target specific entities, thereby subjecting them to a non-neutral regulatory burden based on a bigness biased assumption that they would behave unfairly once engaged in retail financial markets. Second, and most importantly, large incumbent banks would be in a privileged position because they would be protected from BigTechs' potential competition, but still free to harness FinTech-enabled solutions to drive out of the market small local banks unable to bear the cost of the Open Banking transition. Hence, somewhat paradoxically, early *ex ante* regulatory measures specifically imposed on BigTechs could end up frustrating the pro-competitive aim of the PSD2. Indeed, as FinTech start-ups seem more likely to work alongside incumbent banks rather than compete with them, limiting the entry of BigTechs may remove the only effective source of competitive pressure for traditional banks.[755] This is an issue that needs to be carefully considered by financial supervisors, competition authorities and policy makers. Since the focus of the DMA is on digital markets, it seems unlikely that such piece of legislation could tackle the conduct of banking incumbents in Open Banking environments.

Finally, it should be borne in mind that the ordinary legal framework would still apply. Hence antitrust enforcement would still be required to oversee and fight any anti-competitive conduct it may arise. If either incumbent banks or BigTechs engage in tying practices, discrimination, or other abusive conducts, competition authorities would be in the position to investigate and prosecute such activities. Furthermore, if BigTechs were to actively perform regulated activities (such as taking deposits or originating loans), they would still be subject to prudential and financial regulation on a level playing field with traditional financial institutions.

4.14 Concluding remarks. Preserving the pro-competitive potential of PSD2

In its recent Communication on 'A European strategy for data', the European Commission stated that it will support the establishment of a common European financial data space, to stimulate, through enhanced data sharing, innovation, market transparency, sustainable finance, as well as access to

[755] See also Enriques and Ringe (2020) arguing that FinTech firms and established financial institutions are likely to be motivated to join forces to counter the entry of BigTechs.

finance for European businesses and a more integrated market.[756] In this scenario, after acknowledging the important step towards Open Banking marked by the PSD2, the Commission announced that it will further facilitate access to public disclosures of financial data or supervisory reporting data, currently mandated by law, for example by promoting the use of common pro-competitive technical standards.[757]

However, some commentators warn about the risk of a regulatory backfire, arguing that the entry of BigTechs into financial services as a result of the XS2A may strengthen their market power. Notably, leveraging their data advantage in digital markets and their privileged access to advanced technologies, BigTechs may quickly scale-up in financial markets and entrench the dominance of their ecosystem by combining financial and non-financial services and engaging in self-preferencing. Against this background, the Expert Group on Regulatory Obstacles to Financial Innovation set up by the European Commission has recommended the introduction of *ex ante* rules to prevent large, vertically integrated platforms from discriminating against product and service provision by third parties.[758] This recommendation is in line with other and more general reform proposals aimed at providing greater control on practices and business models of gatekeeping online platforms. Indeed, the European Commission is further exploring the adoption of an *ex ante* regulatory framework for large online platforms acting as gatekeepers[759] and a new competition tool.[760]

Nonetheless, it seems that crafting an *ex ante* regulation tailored to platform-based technology companies could be counterproductive and at odds with the pro-competitive aim of the PSD2. Indeed, in the banking sector, gatekeepers are represented by financial institutions, rather than BigTechs. As FinTech start-ups seem more likely to work alongside incumbent banks rather than compete with them, imposing entry barriers to BigTechs may remove the only effective source of competitive pressure for traditional banks.

The risk that BigTechs may increase competition only in the short term cannot be underestimated. However, at this stage it is not possible to predict if and how they will be able to disrupt retail banking markets. Furthermore, there will always be room for antitrust enforcement to challenge potential anti-competitive practices carried out by incumbent as well as new entrants. Since we are still at an early stage of the transition to Open Banking, priority should be given to a clear evidence-based approach in designing future regulatory policies that are going to affect financial markets in the long term.

[756] European Commission (2020) 22.
[757] European Commission (2020) 30.
[758] Expert Group on Regulatory Obstacles to Financial Innovation (2019) 79-80.
[759] European Commission (2020c).
[760] European Commission (2020d).

Part I. Pro-Competitive Regulation and FinTech.

CHAPTER 5 - Designing pro-competitive data sharing regimes: APIs standardization across the E.U.

Short abstract of the chapter

The Open Banking experience has served as a blueprint for building a trusted data governance framework hinged around interoperability between market players. This chapter builds on this intuition and takes a more policy-oriented approach. By drawing on the European pro-competitive regulatory experience within the payment sector, this part of the work sheds light on the role and regulation of Application Programming Interfaces (APIs) for enabling effective data sharing across the market. The systematic adoption of open and standardized APIs by firms and developers appears crucial to unlock competition and ultimately promote the flourishing of Artificial Intelligence (AI) and Internet of Things (IoT) innovation. By looking at the main European regulatory initiatives which have so far surfaced in the realm of data governance other than the access to customer account data rule (right to personal data portability, free flow of non-personal data, re-use of government data), this chapter points out that APIs have emerged within the digital policy strategy of the European Commission as a key enabler of interoperability among private and public undertakings.

On a more critical note, I suggest that the EU legislator is not tackling the matter consistently. Indeed, on one side, all these initiatives share a strong reliance on APIs as a key facilitator to ensure a sound and effective data sharing ecosystem. However, on the other side, all these attempts are inherently different in terms of rationale, scope and implementation. The chapter stresses that data sharing via APIs requires a complex implementation process and sound standardization initiatives are essential for its success. As for pricing and compensation issues, the work points out that placing excessive reliance on fair, reasonable and non-discriminatory (FRAND) terms might be counterproductive.

5.1 Introduction. Data access as the key to unlock digital innovation

Access to data and related data sharing practices have gained attention among policy makers as a crucial factor in unlocking competition and enabling innovation to flourish. With the European Data Economy initiative, the European Commission has made clear its intention to nurture the development of the data-driven economy by nudging the sharing and reusing of data within the

Internal Market[761]. This initiative is strictly linked to Regulation on the free flow of non-personal data in the EU, aimed at ensuring that no physical or legal barriers will hinder the development of the European data economy[762]. Indeed, the rapid development of the data economy and emerging technologies are raising novel legal issues surrounding questions of access to and reuse of data and the expanding IoT, AI and machine learning, represent major sources of non-personal data. Further, the European Commission has repeatedly advocated for Open Data policies in recent years[763].

The reason for such close attention by policy makers is the widely acknowledged function that massive data exploitation is going to have in the rise of both Internet of Things (IoT) and Artificial Intelligence (AI) applications.[764] Indeed, as data-enabled services hold the promise to strengthen competition and boost innovation in both existing and newly arising markets, there is room for customers and businesses to benefit considerably from a data-driven economy.

Data analytics tools are essential to optimise mechanisms and complex decision processes, allowing firms to thrive by extracting value from information and delivering tailored services with significant added value for consumer welfare. Accordingly, the free movement of data has been emerging as a new building block of European policy, laying the foundation for the development of new innovations based on big data exploitation, such as AI and the IoT[765]. AI environments are inherently dependent on data as an essential raw material, particularly with regards to machine learning and deep learning[766]. Since AI functioning is based on the identification of patterns in available datasets and the subsequent making of predictions and correlations able to solve technical problems, the presence of large amounts of information to be processed is crucial to its functioning[767]. Hence, emerging technologies need continuous access to streams of data from several sources, generated by machines and connected devices.

The dependence of IoT and AI applications on the enormous diversity of data sources and types requires serious effort to ensure interoperability, format standardization as well as an efficient system of personal information management. Indeed, IoT hinges on standards and interoperable communication protocols which allow a dynamic global network infrastructure consisting of physical

[761] European Commission (2018a). The chapter is based on the following article: Borgogno, Oscar and Colangelo, Giuseppe. "Data Sharing and Interoperability: Fostering Innovation and Competition through APIs*". Computer Law & Security Report* 35, no. 5. (2019): 1.
[762] Regulation of the European Parliament and of the Council on a framework for the free-flow of non-personal data in the European Union [2018] OJ L303/59, Recitals 1 and 9.
[763] European Commission (2014a), 5; European Commission (2017a), 11.
[764] OECD (2019); European Commission (2018b), 1.
[765] European Commission (2017a), 8.
[766] See Harhoff, Heumann, Jentzsch and Lorenz (2018), 14-18, arguing that an AI strategy also requires a data strategy.
[767] European Commission (2018c), 6; European Commission (2018d), 4; European Commission (2018a), 2-3. See also Joint Research Center (2018).

and virtual 'things' (such as traditional and autonomous vehicles, mobile phones, home devices, and so on)[768]. These devices are integrated by means of intelligent interfaces and create smart environments where each item is able to interact in order to improve its own usefulness.

A key factor of these cross-sector applications stems from the openness of data transferred according to agreed semantic models[769]. Therefore, data infrastructures capable of gathering and streaming a vast array of data as a sort of modern pipeline are going to be crucial for the IoT to flourish.[770] EU firms need to be intensive data users in order to play an active role in these data-driven markets, but nowadays only a tiny 6.3% of European undertakings are able to proactively engage in such a new environment[771].

Policies that encourage competition, data sharing, and openness represent an important determinant of economic gains from the development and application of IoT and AI[772]. So far, regulatory interventions dealing with the matter have focused on fostering as much data-driven innovation as possible by means of tools that, even if substantially different, underpin an identical goal, namely the strengthening of competition through data sharing. As a matter of fact, firms holding large data pools are reluctant to share with actual or potential competitors what represents one of their utmost value assets. Additionally, concerns hinging on confidentiality and trade secrets are likely to raise high barriers which may jeopardise the functioning of a common data space[773]. The European Commission has already started to tackle these issues with a broad array of different and heterogeneous legislative initiatives. While the General Data Protection Regulation (GDPR) introduced a general scope data portability right,[774] the Second Payment Service Directive (PSD2) enshrined a sector-specific access to account data rule,[775] the Regulation on free-flow of non-personal data address data sharing practices in the commercial arena (business-to-business), and the recent Directive on open data aimed at promoting the re-use of government information[776]. At the same time, such a wide range of

[768] PWC (2017), 2-3.
[769] Deloitte (2017), 6.
[770] Varian (2018), 7.
[771] IDC and Open Evidence (2017), 75.
[772] See Cockburn, Henderson, and Stern (2019), highlighting that, because the performance of deep learning algorithms depends on the training data that they are created from, barriers to data sharing could result in a balkanization of data within each sector, not only reducing innovative productivity within the sector, but also reducing spillovers back to the deep learning general purpose technologies sector, and to other application sectors.
[773] Graef, Husovec, and Purtova (2018), 1364.
[774] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC [2016] OJ L119/1, Art. 20.
[775] Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC, [2015] OJ L337, Art. 67.
[776] Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information (recast) [2019] OJ L172/56.

initiatives entails the risk of inconsistencies when it comes to legal certainty for merchants and consumers[777].

Against this heterogeneous background, Application Programming Interfaces (APIs) surface as a technical tool capable of ensuring a smooth flow of data between undertakings[778]. They are sets of protocols which define how software components communicate with one another. By allowing a firm to easily access the data gathered by another company, APIs are set to strengthen interoperability among different players and facilitate the exchange of data streams or datasets between data holders. Despite their clear pro-competitive potential, there is no consensus regarding who should define the APIs nor, even more importantly, whether to standardize their creation. To avoid such a risk, the EU institutions have encouraged companies all over the Internal Market to consider using open, standardized and well-documented APIs more broadly. This could include making data available in machine-readable formats and the provision of associated metadata.

In the light of this development, two main points deserve investigation.

First, the regulatory approach adopted by the EU reflects the idea that the traditional antitrust enforcement toolbox by itself is inadequate to tackle effectively the need to ensure access to data.[779] The scope of competition law is limited by the fact that it can be invoked only to gain access to a dataset held by a dominant firm, on a case-by-case basis. Furthermore, access can be imposed under antitrust law only if a refusal to grant access is considered abusive and if the resource at issue is considered essential according to the requirements set by the case-law.

Second, even though APIs standardization is going to play a key role with reference to data access and sharing remedies which are emerging in both public and private landscapes, we intend to sound a note of caution against expectations that fair, reasonable and non-discriminatory (FRAND) terms could ensure a smooth access to data avoiding litigation among data holders and access seekers[780]. Conversely, it is worth evaluating the on-going implementation process under PSD2 of the access-

[777] Graef, Husovec, and Purtova (2018).
[778] See also OECD (2019), 32, considering APIs as promising mechanisms through which data access can be controlled through time. Namely, a key advantage of an API is that an API enables a software application to directly use the data it needs. Data holders can also implement several restrictions via APIs to better control the use of their data including means to assure data syntactic and synthetic portability. Furthermore, they can control the identity of the API user, the scale and scope of the data used (including over time), and even the extent to which the information derived from the data could reveal sensitive/personal information.

[779] See Chapter 3, Section 2 for an in-depth analysis of how antitrust enforcement can deal with the data bottleneck problem and its relationship with pro-competitive regulation.
[780] See European Commission (2017a), 13; European Commission (2018e), 7.

to-account rule as it is at an advanced stage and might provide a useful lesson on how to design sector-specific regulation mandating a workable access to data.

The aim of this chapter is twofold. First, it aims to provide an overview of the main initiatives undertaken to enable access to data throughout the Internal Market and highlight the key role that APIs are going to play in this landscape. Second, drawing on the well-established antitrust literature on standardization and APIs design, the work will shed some light on concerns and risks that could jeopardise the free movement of data. In this context, Section 2 focuses on the most relevant data portability tools envisaged by the European Union together with the access-to-account rule under the PSD2, namely the data portability right under the GDPR, the attempt to regulate free-flow of non-personal data and the re-use of government data. Section 3 starts off by assessing the consistency of the EU regulatory policy in order to stress the key role of APIs standardization as well as the significance of the data compensation issue. Section 4 concludes with recommendations aimed at designing a sound regulatory framework based on a sector-specific approach tailored to the needs of the new API economy.

As already pointed out in chapter 3, competition policy makers have long been debating the role of antitrust in facilitating data sharing in order to ensure a level playing field between undertakings. In accordance with competition law, access to data can be obtained only in exceptional circumstances, notably those referred to in the essential facility doctrine (EFD). Since this work already dealt with a comprehensive discussion of why antitrust enforcement may not be the right tool to address data access in a systematic way, the present chapter focuses on the regulatory regimes designed within the European Union other than the access-to-account regime enshrined in the PSD2. Similarly, the potential spillovers of pro-competitive regulation mandating data sharing in terms of consumer welfare and concentration dynamics are targeted respectively in the first and second section of chapter 4 and would not be analyzed in this part of the work.

5.2 Data access under regulatory regimes

Due to the above-mentioned limits of antitrust tools, regulatory interventions seem better suited to tackling data-driven economy core issues. Since each industrial sector presents specific and dynamic needs that should be duly addressed, regulation may readily be tailored on such peculiarities in order to accomplish coherent forms of data access. Nevertheless, any regulatory initiative is called to solve two main thorny issues. First, the effectiveness of data sharing regulatory interventions is linked to the technical implementation process. Second, if access to datasets has to be provided for, then it is

equally necessary to establish appropriate compensation schemes able to strike a balance between the conflicting interests of data holders and access seekers.

The European Commission has started to tackle the issues of data sharing and interoperability with a broad array of different and heterogeneous legislative initiatives aimed at promoting data portability. Indeed, data interoperability considerations are closely related to questions of data portability, since "effective portability policies must be supported by appropriate technical standards in order to implement meaningful portability in a technologically neutral manner."[781] Therefore, it is worth carrying out an analysis of the major European legislative attempts to enact data sharing regimes in order to evaluate whether and how they can effectively help to achieve the ambitious goal of a common data space.

5.2.1 Personal data portability

The right to data portability enshrined in the GDPR has been recognized as a breakthrough in the realm of EU personal data protection law[782]. In fact, this innovation can be read as the first bold complement to the Digital Single Market Strategy launched by the European Commission in 2015[783]. Moreover, as a substantial part of the data flowing throughout the Internal Market are personal data according to the broad definition set forth in the GDPR, such new regime represents a corner-stone of the European data common space[784]. According to the Working Party 29, the right to data portability has to be intended as a building block of a wider framework of "workable mechanisms for the data subject to access, modify, delete, transfer, or otherwise further process (or let third parties further process) their own data"[785]. By introducing this legislative instrument, the EU sought to empower individuals by granting them more control over their personal data[786]. Leaving aside the access-to-account rule under the PSD2, no attempt to enact a similar regulatory initiative has been pursued before[787].

On a more technical note, the objective scope of portability is limited to "personal data concerning him or her, which he or she [the data subject] has provided to a controller" [788]. By exercising

[781] European Commission (2017), 16.
[782] As pointed out in De Hert, Papakonstantinou, Malgieri, Baslay and Sanchez (2018) 194, the closest theoretical precursor of data portability is the number portability enshrined in the Article 30 of the Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services.
[783] European Commission (2015), 14.
[784] GDPR, Article 4.
[785] Article 29 Data Protection Working Party (2013), 47.
[786] Article 29 Data Protection Working Party (2017), 2; GDPR, Recital 68. See also Colangelo and Maggiolino (2019).
[787] Custers and Ursic (2016), 9.
[788] GDPR, Article 20.

portability individuals are allowed to "have the personal data transmitted directly from one controller to another, where technically feasible". It becomes very clear that the legislative goal behind the right to data portability is delivering interconnection of all digital services within the Internal Market. In line with the other regulatory tools further analyzed, this mechanism intends to support the development of user-centric service providers engaging smoothly with each other by means of interconnection and interoperability.

From a substantive point of view, data portability encompasses three different and complementary rights: (1) the right to receive data provided by data subject; (2) the right to move those data to another controller; and (3) the right to have the personal data transferred directly from one controller to another. Clearly, data controllers are strictly forbidden from hindering the exercise of those rights by individuals[789].

The first two rights can be freely exercised (provided that the processing is based on consent or on a contract and is carried out by automated means). Conversely, the third is dependent on its technical feasibility, meaning the interoperability of the systems involved.[790] Furthermore, since these rights are within the general scope of the GDPR, every controller is obliged to comply with them regardless of its size, the reasons for which portability is sought and the scale of its processing activity.

In addition, by affirming individuals' control over their personal data, data portability is expected to tackle personal data lock-in problems as well as to 're-balance' the relationship between data subjects and data controllers (i.e., between digital consumers and digital platforms), and to encourage competition between companies[791]. Indeed, the rationale for the data portability right fits better within a competition policy framework than it does on traditional data protection systems hinged on Article 8 of the EU Charter of Fundamental Rights. Customer empowerment by means of individual control over personal data has the potential to unlock competition within data-driven markets[792]. Thus, the main goal underpinning data portability is the promotion of competition among data-enabled service providers rather than the creation of an early form of personal data subjects' default ownership[793]. It should be borne in mind, however, that a proper data portability remedy stemming from competition

[789] GDPR, Article 20.
[790] GDPR, Recital 68.
[791] Article 29 Data Protection Working Party (2017), 4. See also European Commission (2018g).
[792] Lynskey (2017), 803. See also Kathuria and Lai (2018), exploring the possibility of porting user reviews in order to enhance the competition among e-commerce platforms.
[793] In fact, property would entail the right to exclude anyone, which is not provided by the right to data portability under the GDPR. Similarly, the right to erasure under the GDPR (Article 17) cannot be considered a proprietary tool, due to its extremely limited (and highly contested) applicability. On this point, see Graef, Husovec, and Purtova (2018). Instead, for a view supporting a proprietary setting, see De Hert, Papakonstantinou, Malgieri, Baslay, and Sanchez (2019), 201.

law would be different as it would apply to all (personal and not personal) data held by dominant firms on a case-by-case basis.

As it stands, the right to personal data portability is likely to prove problematic with regards to its implementation. In fact, Article 20(1) of the GDPR does not provide detailed guidance on how to ensure data portability among undertakings. It merely states a general requirement for the format of transmitted data, which need to be "structured, commonly used and machine readable." That is to say, file formats structured in such a way that software applications can easily identify, recognise and extract specific data from them[794]. For instance, as clarified by the Article 29 Working Party, PDF documents do not fall under the meaning of machine-readable. Conversely, machine readability is ensured by as many metadata as possible at the highest level of granularity and abstraction as this allows to "accurately describe the meaning of exchanged information"[795]. From a more practical perspective, this translates into a duty placed on data controllers to "provide personal data using commonly used open formats (e.g. XML, JSON, CSV,…) along with useful metadata". That being said, suitable metadata should be deployed "without revealing trade secrets"[796].

Further, any attempt to mandate the adoption of interoperable standards is excluded as Recital 68 does not go beyond a simple "encouragement". Such lack of any binding provision or detailed guideline covering the implementation of data portability is likely to raise serious concerns on effectiveness and legal certainty. Interoperability and portability need to be made effective, otherwise they will remain a dead letter[797]. For its part, the WP29 advisory group suggested the adoption of APIs to implement data portability with a sector-specific approach.[798] More specifically, data controllers ought to deploy APIs so that other systems or applications can link and work with their systems. By so doing, "it may also be possible to offer a more sophisticated access system that enables individuals to make subsequent requests for data, either as a full download or as a delta function containing only changes since the last download". In the same vein, this instrument would make portability requests not excessively "onerous on the data controller" as well as "lessen the potential burden resulting from repetitive requests"[799].

[794] Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information [2013] OJ L175, Recital 21.
[795] Article 29 Data Protection Working Party (2017), 18.
[796] Article 29 Data Protection Working Party (2017), 18.
[797] Borgogno and Poncibò (2019).
[798] Article 29 Data Protection Working Party (2017), 17.
[799] Article 29 Data Protection Working Party (2017), 15, 19.

However, nothing is mentioned with reference to their structure (open or closed), potential standardization attempts or terms and conditions of the license[800]. Admittedly, in order to address potential challenges arising from the application of data portability to large and complex data sets, the Article 29 Working Party suggests to rely on "externally accessible API" by either individuals or third-party software[801].

The major risk stemming from this light-touch regulatory approach is an inconsistent development of personal data portability throughout the market which could ultimately hinder the development of a European common data space. In fact, even though some sectors are already at an advanced stage in providing applications for transferring data, other market players might struggle to keep pace with such development as no open interoperability standards are yet available[802]. Suffice it to say that the Data Transfer Project launched by tech-giants Microsoft, Google, Twitter and Facebook explicitly promises to smooth the export and movement of data among service providers, but minor competitors or small firms are likely to lose further ground in the battle for the data as a direct consequence of it[803]. In fact, without a serious and detailed open standardization effort, business costs arising from data portability compliance might jeopardise competition rather than enable it to thrive. Moreover, leaving market players completely free to adopt poorly secured and flawed APIs can lead to massive data breaches and open the gate to cybersecurity attacks, as demonstrated by the Cambridge Analytica scandal[804].

5.2.2 Free flow of non-personal data

As machine learning, artificial intelligence and the IoT are increasingly growing source of non-personal data, the European Commission decided to provide a coherent set of rules catering for free movement of different types of data by means of a specific regulation proposal[805]. In the intentions of the EU, this legislative tool should complete and complement the legal framework enshrined in the

[800] Article 29 Data Protection Working Party (2017), 17, states only that "formats that are subject to costly licensing constraints will not be considered an adequate approach."
[801] Article 29 Data Protection Working Party (2017), 19.
[802] Lynskey (2017), 807.
[803] See Facebook, Google, Microsoft, and Twitter (2018), 4. In July 2018, Microsoft, Google, Twitter and Facebook, announced the launch of a joint open-source initiative called the Data Transfer Project with the objective of easing user data transfer among their platforms. According to their declarations, such a new data portability mechanism will remove the infrastructure burden on providers and users related to portability of data from one company to another: "[T]he future of portability will need to be more inclusive, flexible, and open. We believe users should be able to seamlessly and securely transfer their data directly from one provider to another."
[804] Polański (2018), 141.
[805] *Regulation (EU) 2018/1807 of the European Parliament and of the Council of 14 November 2018 on a framework for the free flow of non-personal data in the European Union [2018] OJ L 303.*

GDPR, laying down a clear, comprehensive and predictable regulatory regime able to deliver free movement of data in the single market.

The core objective of the Regulation is threefold. First and foremost, it introduces what can be considered the fifth freedom in addition to the four traditional ones (involving citizens, goods, services and capital), namely the free movement of data within the Union[806]. Accordingly, apart from restrictions justified on grounds of public security, Member States would lose the power to oblige undertakings to process or locate data within their borders by setting, for instance, data localization requirements. At the same time, such provision would not affect the principle of data availability for regulatory control which represents the second cornerstone of the proposal[807]. Lastly, the Regulation acknowledges that "the ability to port data without hindrance is a key facilitator of user choice and effective competition."[808]

Hence, the Regulation entrusts the European Commission to encourage and facilitate the development of self-regulatory codes of conduct, in order to define guidelines on best practices in facilitating the switching of providers and to ensure that they provide professional users with sufficiently detailed, clear and transparent information before a contract for data storage and processing is concluded[809]. These guidelines should take into account: (a) best practices for facilitating the switching of service providers and the porting of data in a structured, commonly used and machine-readable format including open standard formats where required or requested by the service provider receiving the data; (b) minimum information requirements to ensure that professional users are provided, before a contract for data processing is concluded, with sufficiently detailed, clear and transparent information regarding the processes, technical requirements, timeframes and charges that apply in case a professional user wants to switch to another service provider or port data back to its own IT systems; (c) approaches to certification schemes that facilitate the comparison of data processing products and services for professional users to facilitate the comparability of those products and services; (d) communication roadmaps taking a multi-disciplinary approach to raise awareness of the codes of conduct among relevant stakeholders.

The legislative initiative at issue is not immune from criticism. Even though article 6 creates a new right to business-to-business data portability, similar to the right provided to personal data by Article 20 of the GDPR, the distinction between personal and non-personal data is rather blurred. Indeed, since the scope of the latter depends on the former, it would be necessary to embark on the challenging

[806] Regulation on the free flow of non-personal data, Article 4.
[807] Regulation on the free flow of non-personal data, Article 5.
[808] Regulation on the free flow of non-personal data, Recital 29.
[809] Regulation on the free flow of non-personal data, Article 6.

enterprise of delimiting the slippery definition of personal data phrased by the GDPR as "any information relating to an identified or identifiable natural person ('data subject')."[810] According to the case law of the Court of Justice of the European Union (CJEU) as well as the relevant opinion issued by the Article 29 Working Party, it is clear that whether the personal data "relates to" an "identified or identifiable" individual is ultimately a matter of a case-by-case assessment since these are extremely broad concepts constantly subject to dynamic contextual adaptation[811]. This interpretative issue is further exacerbated in the current data-driven economy and hyper-connected organisations where information de-anonymisation is going to be easier as IoT and AI advance.

Leaving aside these normative concerns, the Regulation demonstrates the strong willingness of EU policy makers to enact a comprehensive form of non-personal data portability able to better meet the competitive need of data-driven markets. Somewhat surprisingly, the European Commission has acknowledged more recently, upon pressure from several stakeholders, that nudging firms towards the adoption of interoperability standards might be rather more appropriate than horizontal legislation on data sharing in business-to-business relations.[812] This is likely to imply that data trading governance will continue to be rooted on freedom of contract rather than on hypothetical forms of ownership.

Against this background, APIs are set to take center stage again. Nowadays many firms which hold significant data pools do not leverage their commercial potential or, more often, prevent other companies from accessing them, thereby hindering competition and, ultimately, innovation[813]. In this respect, a wise first step in tackling this problem effectively could be the encouragement of a systematic use of secured and open APIs. As envisaged by the European Commission, the set-up and use of these interfaces would require to be grounded on the following principles: "stability, maintenance over the lifecycle, uniformity of use and standards, user-friendliness as well as security"[814]. Accordingly, under the Connecting Europe Facility Programme, the Support Centre for Data Sharing (the Centre) has been established on 15 July 2019 by the European Commission to further support the development of the Digital Single Market. The Centre is entrusted with the task

[810] GDPR, Article 4(1). Article 2(2) of the Regulation on the free flow of non-personal data states that, in the case of a data set composed of both personal and non-personal data, the Regulation applies to the non-personal data part of the data set; where personal and non-personal data in a data set are inextricably linked, the Regulation shall not prejudice the application of GDPR. See Drexl (2019), underlining the need to go beyond personal data in designing data portability and data access rights and arguing for an integrated data economy law that avoids a distinction of the scope of application of individual rules along the dividing line between personal and non-personal data.
[811] Graef, Gellert, Purtova and Husovec (2018).
[812] European Commission (2018a).
[813] For an economic analysis of the competitive advantaged stemming from the introduction of mandatory data sharing regime in data-driven markets, see Graef and Prüfer (2018); Prüfer and Schottmüller (2017).
[814] European Commission (2018a).

to ease contractual relationships enabling the use and re-use by undertakings of data held by public sector or private sector entities (i.e. practices of sharing). This means assisting firms in developing sound APIs with best-practices examples, model contracts and other technical and legal support. Similarly, the Centre is expected to work on data security, identification and traceability of data sources, and data publication through APIs.

While acknowledging that no single model for sharing data has emerged yet, the Centre is committed to observe and document experimental or established practices of companies, governments and organizations across countries and sectors. In this respect, the "Data Sharing Toolkit" has been created in order to make available lessons learned, resources, and recommendations that span from the access, exploitation, and evaluation of data on one side, to the creation of sustainable businesses on the other.

Furthermore, the Centre is following activities at the interplay between personal and anonymized data, such as the Data Mobility Infrastructure Sandbox, namely an experimental project in partnership between Barclays (a bank), the BBC (a media organisation), BT (a telecom company), Centrica (an energy company), digi.me (storing and sharing data service provider) and Facebook. The initiative aimed at exploring how to enable organisations and citizens to access the economic and social benefits of so-called "Personal Data Mobility". According to the official report, data sharing needs to be facilitated by some entity on behalf of individuals, that is a data facilitator. Admittedly, such kind of providers have not yet found their role in the market but are recognized as a core part of the model to enable individuals to feel more comfortable and able to share data.

In the same vein, the Centre recently pointed out that data sharing in the agricultural sector and smart farming are increasingly relying on sensors measuring product quality, ground conditions and pest developments, temperature, and water usage.[815] Data generated by these sources can be used for a wide variety of purposes which eventually may drive farmers to more efficient decision-making processes. Field sensor data, for example, can be combined with weather data and applied to artificial intelligence to predict droughts or diseases that could damage harvests; data from milk machinery can be translated into insights that show farmers at one glance the health of their cows. However, sharing agricultural information faces a twofold hurdle. First, data collection is relatively fragmented and take place in silos (between local farmers or companies that already are used to sharing with each other). Second, farmers have little control over who has access to the data produced on their farms and for what purposes. The Centre is following the activity of JoinData, a non-profit platform founded

[815] Support Centre for Data Sharing (2019), <https://eudatasharing.eu/examples/data-sharing-agricultural-sector> accessed on 25 November 2021.

in 2017 by Dutch farmer cooperatives in order to facilitates secured data sharing along the value chain.

Similarly, the Centre targeted experiments of data sharing among national governments (such as the Nordic Institute for Interoperability Solutions) and private mobility data sharing (such as the Spanish case of the the Consorcio Regional de Transportes de Madrid).

5.2.3 Account data portability

As illustrated in Chapter 3, over the last twenty years payment law in the EU witnessed the raise of the so-called "regulation for competition" approach which impacted substantially on data sharing practices within the financial industry[816]. The European Commission decided to address the disruption brought by financial technology innovation also by means of a sector-specific form of data portability enshrined in the Directive 2366/2015 on payment services in the internal market (PSD2), named Access to Account (XS2A) rule.

From a competition policy angle, a major concern stems from the likelihood that banks may design their own APIs in subtly different ways that would make it extremely tricky (and far more expensive) for third party providers to develop services capable of plugging-in with each of them. This would result in a chronic lack of interoperability and would negatively affect consumer welfare. Furthermore, even the PSD2 objectives of commonality and harmonization would be seriously put at risk. For these reasons, allowing a wide range of API standards to be adopted to implement account data portability would pose a serious threat that duly requires to be targeted. A minimum level of standardization would instead allow developers to design innovative applications that work efficiently across the market in a harmonized way.

It is worth looking at how different countries have decided to tackle the matter by adopting policy strategies in a context of strong regulatory competition. Beyond the European borders, regulators in several jurisdictions have recently expressed interest in developing frameworks that put consumers in control of their account data by means of standardized APIs. In particular, the Australian Government Productivity Commission recommended the adoption of an Open Banking regime that gives consumers access to their data, with the capacity to have that data moved from one provider to another[817]. Along these lines, the new Australian Consumer Data Right introduced a broad right of data portability, which will initially be applied to the banking sector, while the Australian

[816] For an in-depth analysis of this regulatory measure, see Section 3.3.
[817] Australian Government Productivity Commission (2018).

Competition and Consumer Commission enacted rules requiring the four major banks to share product reference data (including information such as interest rates, fees and charges, and eligibility criteria for banking products like credit cards and mortgages) with accredited data recipients[818]. By the same token, the Mexican FinTech Law (*Ley de Instituciones de Tecnología Financiera*), which came into force on 10 March 2018, requires financial entities and FinTech institutions to establish APIs to allow, with the prior consent of users, connectivity and access to interfaces developed or managed by other financial entities and FinTech players. In the same vein, the Canadian Competition Bureau has invited policy makers to take significant steps to welcome FinTech by enacting broader open access regimes to financial data through APIs[819]. As a result, the Canadian Minister of Finance appointed an Advisory Committee to guide the Government's review into the merits of Open Banking[820].

Furthermore, in 2017 Japan amended its Banking Act to promote open innovation, enabling FinTechs to access financial institution systems via API connection. Similarly, the Hong Kong Monetary Authority launched the Open API Framework in 2018, providing specific guidance to enable collaboration between banks and third party service providers, and the Monetary Authority of Singapore published an API Playbook and set up an API register to encourage banks to open up their systems. Finally, Brazil is also following suit with an Open Banking regulation which became effective by the end of 2020[821].

At the same time, the English Consumer and Market Authority (CMA) together with the UK Government Open Banking Working Group are paving the way to an Open Banking environment through the creation of an open API framework even more ambitious than PSD2's goals[822]. As illustrated in section 4.5, the CMA made use of a market remedy to make data sharing mechanisms as smooth as possible.

Further, a duty was placed on banks to publish trustworthy and objective information on the quality of services on their website and branches in a form capable of being used by comparison tools. Incumbents were required to send out suitable notices to consumers outlining any increase in charges or closure of local branches so that they could evaluate whether to switch banking provider. In order to address consistently any disputes between providers or with consumers, the CMA entrusted the Implementation Entity to set up a clear redress mechanism was envisaged in order. Finally, the overall

[818] Australian Competition and Consumer Commission (2020).
[819] Canadian Competition Bureau (2017).
[820] Government of Canada (2019). See also Advisory Committee to the Open Banking Review (2019).
[821] In November 2019, the Brazilian Central Bank published the draft regulation for public consultation.
[822] Milanesi (2017), 32.

reliability of the access to account data envisage has been secured by the CMA by setting a up a ledger of authorized third parties that can seek access to transaction data managed by the Financial Conduct Authority (FCA).

5.2.4 Open data and re-use of public sector information

Public undertakings, in carrying out their tasks, are a tremendous collector of information (e.g. statistics, digital maps, meteorological data, legal information and so forth). Public sector information (PSI) is acknowledged as a valuable resource for the digital economy both in terms of raw material for data-enabled services but also for the delivery of more accurate decision-making in society. Indeed, the total direct economic value of PSI peaked at a level of 52 billion euros in 2017 and it is expected to increase to 194 billion by 2030[823]. Allowing such data to be re-used for other purposes by private and public undertakings might enable the delivery of new services and products across several sectors of the Internal Market. At the same time, it would boost the development of new technologies which rely on the continuous processing of vast amounts of high-quality data-streams. On top of that, policymaking and public administration activity are likely to benefit in terms of efficiency and effectiveness from such fostered interaction with technology companies leveraging big data.

Given the above-mentioned potential of public and publicly-funded data, the European Commission, as part of its Digital Single Market strategy, decided to meet the expectations of undertakings by encouraging data re-use and PSI access through the Open Data Directive, published on 26 June 2019.[824] It replaces the Public Sector Information Directive, also known as the PSI Directive (2003/98/EC) [825], and member states had to implement it by 17 July 2021[826]. Such legislative initiative has been designed to reach several objectives with a multi-level effort.[827] First, it aims at lowering charges and transaction costs to access PSI for small and medium firms. Second, new categories of data would fall under the scope of the Directive, such as those related to public utilities, transport and research. Third, the proposal addresses the problem of excessive first-mover advantages arising from poorly-designed public-private arrangements which ultimately can lead to a monopolistic exploitation of PSI by a few players. Such risk has been mitigated by extending as far as possible the range of re-

[823] Deloitte (2017a), 385.
[824] Directive on open data and the re-use of public sector information. A similar effort has been undertaken also by other countries. For instance, the Australian Government (2018b) has recently proposed the introduction of a legislation to improve the sharing, use and reuse of public sector data.
[825] Directive (EC) 2003/98 of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information [2003] OJ L345.
[826] Directive on open data, Articles 17(1).
[827] European Commission (2018a), 5.

users and by widespread notice of the availability of PSI. Fourth, a systematic up-take of APIs has been identified as the right instrument to ensure smooth access to dynamic dataflow.[828]

Therefore, in accordance with the overall strategy enacted by the European Commission for a common data space, APIs are also set to play a crucial role with reference to the sharing of publicly-funded data. In essence, the proposed changes to the Directive aim at speeding up the transition of public sector bodies towards digitally-enabled functionalities and contributing to the creation of a valuable ecosystem around data assets. It is worth highlighting that particular attention has been paid by the Commission to the technical details of API set-up and practical use as they would need to be based on availability, stability, maintenance over lifecycle, uniformity of use and standards, user-friendliness as well as security.[829] Moreover, public sector bodies will be entrusted with the task of making data available for access immediately after collection by means of suitable interfaces. As far as fundamental high-value datasets are involved, public bodies would be under a strong obligation to systematically adopt suitable APIs. In this respect, the Directive explicitly provides that APIs shall be used by public bodies to ensure real-time access to data in a timeframe that does not unduly impair the exploitation of their economic potential.[830]

A key element of the regime envisaged in the proposal is that PSI would have to be made available free of charge and, if this should prove unfeasible due to excessive costs, any fee would be limited to the marginal costs.[831] Further, to avoid any clash with personal data protection provision, the proposal states that anonymisation costs could be included in the cost calculation for specific access requests[832].

This Directive introduces the concept of high value datasets, defined as documents the re-use of which is associated with important benefits for the society and economy (namely, geospatial, earth observation and environment meteorological statistics, companies and company ownership,

[828] European Commission (2018a), 5-6: "Providing access to dynamic data via application programming interfaces is particularly important, as it supports the open data ecosystem, saves time and costs through automation of the download process, and greatly facilitates the re-use of data for a wide range of new products and services. Sharing data via the correct and secure use of application programming interfaces can generate significant added value for different actors of the data value chain. It can also contribute to the creation of valuable ecosystems around data assets whose potential is often unused by data holders." According to Joint Research Center (2018), 110, "[u]sing APIs to make the data available to third parties is an essential step towards developing the data economy, but is not enough to underpin an AI strategy. What is necessary is for the European public sector, in particular, to move from pushing the data out – a *broadcasting* model – to drawing the users in, both third-party developers and the public, and to develop interaction, the *interactive* model. … Users' behavior (interaction) and content generated (or exchanged) contribute to form the enhanced data that is so important for AI."
[829] Directive on open data, Recital 32.
[830] Directive on open data, Articles 5(4) and 5(5). See also Recital 31.
[831] Directive on open data, Recital 36.
[832] Directive on open data, Recital 38.

mobility).[833] They are subject to a separate set of rules ensuring their availability free of charge, in machine-readable formats, provided via APIs and, where relevant, as bulk download.

Since this piece of legislation shall be implemented by 17 July 2021, it would be premature to draw any conclusion with reference to the effectiveness of the proposal. However, such a mixed package hinged on lower intensity regulatory intervention fully fits in the overall transition strategy towards an API economy.[834] In this regard, the proposal states that APIs should be supported by clear technical documentation that is complete and available online and, where possible, open APIs should be used: European or internationally recognised standard protocols should be applied and international standards for datasets should be used where applicable[835].

5.3 The role of interoperability and compensation policies

In the abovementioned regulatory interventions, the European institutions have acknowledged the crucial role that APIs are going to play across the whole spectrum of digital society[836].

APIs can be defined in broad terms as software tools designed to enable communication between two computer applications[837]. Through a set of protocols and routines, they allow a digital application to interact with an associated program by describing the kind of data that can be retrieved, how to do it and the format in which information will be filed. These interfaces have different levels of complexity, covering simple links to databases or specific datasets, web getaways and more detailed set-ups. APIs are not only mere pieces of software, but they come with a contract that enshrines the terms and conditions of the license, guarantees and liabilities in case of infringement, and outlines how the interfaces can be used by developers.

APIs offer a twofold advantage in terms of data sharing within and across companies. First, APIs set up a metering system of access to data held in a specific database or server, empowering providers with a sort of smart gateway to their data. Second, depending on whether they are closed or open, APIs represent the building blocks of modular industrial architecture and platform business models

[833] Directive on open data, Article 13(1). The European Commission has been entrusted with the task to adopt a list of specific high value datasets by way of an implementing act, following an impact assessment and with the assistance of a Committee composed of Member States representatives.
[834] This trend is starting to be followed at Member States level: e.g., the Italian Digital Authority (Agid) has recently issued two circulars (see the Italian Official Gazette, 20 April 2018, 109) providing for a duty for cloud service providers of the public administration to adopt suitable APIs in order to guarantee adequate levels of interoperability.
[835] Directive on open data, Recital 32.
[836] European Commission (2018b), 8.
[837] For a technical overview on the structure, functioning, and business impact of APIs, see Russell, Schaub, McDonald and Sierra-Rocafort (2019); Benzell, Lagarda and Van Alstyne (2017); Zachariadis and Ozcan (2017).

respectively[838]. Closed (or internal) APIs are accessible only to those working within a firm. They are used extensively by several companies as they enhance internal integration and speedy data sharing among different departments and employee teams. Indeed, a systematic smooth sharing of data within a firm improves productivity by fostering better exploitation of internal data streams and optimising existing processes[839]. Open (or external) APIs, on the contrary, are aimed at enabling integration with third parties (such as partners, external developers or even competitors) by allowing them to access specific datasets. Such external interfaces are at the very heart of interoperability and modularity which characterise the modern business platform models[840].

By allowing data sharing and interoperability with third parties, open APIs lead to up-selling as well as cross-selling opportunities, thereby allowing digital market-place environments to flourish down the line. Further, APIs provide a scalable mechanism of governance and management of the platform, thereby ensuring control as well as monetisation to the benefit of the platform owner. Monetisation opportunities of APIs vary widely depending on the business method enacted by the provider, leaving aside the topic of APIs copyrightability that could further strengthen the proprietary rights of APIs owners[841]. Owing to all these features, APIs adoption generates decreases in operating costs as well as increases in sales, market capitalisation, intangible assets, and net income[842]. Thus, it is not surprising that nowadays some of the most valuable companies in the world, such as Google, Microsoft and Apple, all share a platform ecosystem model based on external communities of developers[843].

With regard to the interoperability of digital interactive television services, the European authorities stated as long ago as 2002 that the migration from existing APIs to new open APIs should be encouraged and organised[844]. Hence, they invited Member States to "encourage proprietors of APIs to make available on fair, reasonable and non-discriminatory terms, and against appropriate remuneration, all such information as is necessary to enable providers of digital interactive television services to provide all services supported by the API in a fully functional form."[845] However, it must be acknowledged that the increasing number and heterogeneity of market players is likely to lead to

[838] Zachariadis and Ozcan (2017), 6.
[839] Benzell, Lagarda, and Van Alstyne (2017), 6.
[840] Benzell, Lagarda, and Van Alstyne (2017), 3.
[841] On the on-going debate taking place in the U.S. with reference to APIs copyrightability in the aftermath of *Oracle America, Inc. v. Google LLC*, 886 F3d 1179 (Fed. Cir. 2018), see Menell (2018). Recently, the Supreme Court has granted a writ of certiorari to review the case.
[842] Benzell, Lagarda, and Van Alstyne (2017), 32.
[843] Parker, Van Alstyne **and Jiang (2016).**
[844] Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services (Framework Directive), Recital 31, [2002] OJ L108/33.
[845] Directive 2002/21/EC, Article 18(2).

conflicts of interest among platform owners and third-party developers which could end up in litigations and exclusionary or exploitative behaviours[846]. In this respect, APIs can be deployed to engage in anti-competitive practices to the detriment of newcomers or, conversely, to control the platform and ensure an effective level of regulatory predictability by the owner[847]. Depending on how platform owners make use of their open APIs, they can limit or foster access to the relevant APIs or even carry out discriminatory practices.

Among EU policy makers, the necessity to ensure interoperability of datasets for a thriving data-driven economy has attracted explicit interest since the European Council's conclusions of October 2013 focused on the digital economy, innovation and services as drivers for growth and jobs[848]. Notably, in 2014 the European Commission started advocating the adoption of standardized and "shared formats and protocols for gathering and processing data from different sources in a coherent and interoperable manner across sectors and vertical markets."[849] More recently, the European Commission has begun to "explore a possible future EU framework for data access."[850] The underlying goal of such a new far-reaching initiative is to establish a pro-competitive environment where the sharing, aggregation and reuse of machine-generated data could be a source of new business models, in addition to "making relevant data available for training AI applications."[851] Against this background, APIs' architecture and design has been identified as a crucial element for a flourishing common European data space. Consequently, the Commission has envisaged the adoption of a "broader use of open, standardized and well-documented APIs (…) through technical guidance, including identification and spreading of best practice for companies and public sector bodies."[852] Moreover, the Commission has launched an assessment process aimed at deciding how best to encourage undertakings to adopt "open, standardized and well-documented APIs."[853]

5.3.1 The risk of regulatory inconsistencies

[846] Zachariadis and Ozcan (2017), 8.
[847] Zachariadis and Ozcan (2017), 8. See also Plantin, Lagoze and Edwards (2018), 10, noting that APIs are not merely neutral conduits, instead they constitute specific constraints (defined by the platform that creates and controls them), which determine who can access data, in which forms, and under which conditions.
[848] European Council (2013), 4.
[849] European Commission (2014a), 6. See Gal and Rubinfeld (2019), arguing that, since not all data are alike, standardization of data semantics, attributes, structure, formats, or interfaces is needed in order to facilitate interoperability. See also Everis (2018), corroborating findings that the most common obstacles to data sharing are technical barriers and related costs, as well as legal obstacles, and encouraging the European Commission to support the development of data interoperability and standards that enable data sharing and re-use in business-to-business relations.
[850] European Commission (2017a), 11.
[851] European Commission (2018a), 10.
[852] European Commission (2017a), 12.
[853] European Commission (2018b), 8.

We have been witnessing a strong regulatory attempt led by the European Commission to ensure a comprehensive data sharing environment within the Internal Market through APIs and private ordering solutions. Several regimes have already been put forward throughout a quite limited timespan and others are surfacing, such as in the field of electricity and health-care.[854] Additional concerns have been voiced with reference to the agriculture and automotive industries highlighting the fact that new forms of access to in-vehicle and "smart farming" data are required to prevent anti-competitive effects[855].

In this regard, we deem it appropriate to sound a note of caution as it seems that the EU legislator is not tackling the matter consistently[856]. On one side, these initiatives share a strong reliance on APIs as a key facilitator to ensure a sound and effective data sharing ecosystem (regardless of the general or sector-specific approach of the single legislative instrument). On the other side, it is equally true that all these attempts are inherently different when it comes to the underlying rationale and practical implementation.

Whereas for personal data portability nothing is stated with reference to the tools and interoperable formats that data holders shall adopt, for the account data portability rule the European Commission showed much more care in driving its implementation by market players. Moreover, the on-going standardization experience under the PSD2 has showed how complex and troublesome it could be to ensure a sound and effective adoption of a data portability rule across an industry, despite continuous oversight by the European Banking Authority[857]. In this respect, the implementation of free flow of non-personal data as well as personal data portability, or the re-use of government data are likely to be even more time-consuming and challenging, given the multifarious interests at stake across the industries covered by the scope of these regimes.

[854] Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU, [2019] OJ L 158/125; European Commission (2018h), 6-7.

[855] Graef and Prüfer (2018); Kerber (2018); TRL (2017); Wolfert, Ge, Verdouwa, and Bogaardt (2017). See also European Commission (2018i), 12-13, aiming at improving "access and reuse of mobility and vehicle data for commercial and non-commercial purposes," since in-vehicle data have "an enormous potential to create new and personalised services and products, revolutionise existing business models (e.g. roadside assistance, vehicle insurance, vehicle repair, car rental, etc.) or lead to the development of new ones. Different economic actors are competing for such data."

[856] An additional form of data control has been enshrined in the Article 16(4) of Directive (EU) 2019/770 of the European Parliament and of the Council of 20 May 2019 on certain aspects concerning contracts for the supply of digital content and digital services, [2019] *OJ L 136/1*, under which consumers would be allowed to retrieve all content provided by them and any other data produced or generated through the use of the digital content. Since this provision would only ensure an effective consumer protection in the context of contract termination without recognizing a consumer's right to have their digital content directly transmitted to a new provider, it cannot be defined as a proper form of data portability. Similarly, Colangelo and Maggiolino (2017), 10; Graef, Husovec, and Purtova (2018), 1394-1395.

[857] Borgogno and Colangelo (2020), 23-24.

From a comparative perspective, it is worth noting that a general and broad data portability right is also the subject of the recent Australian Government's proposal for the introduction of a new Consumer Data Right, that will be established primarily through amendments to the Competition and Consumer Act (2010) and the Privacy Act (1988)[858]. According to the proposal, as part of the commitment to giving consumers greater control over their data, all customers (both individuals and businesses) will be entitled to exercise the right in relation to the classes of data covered by the right and will have improved access to their own data in a usable form and be able to direct its secure transfer to trusted third parties. Moreover, the Australian Consumer Data Right will be applied sector-by-sector, following analysis of the merits of applying the right to different classes of data and data holders. Hence, since types of data may vary between sectors, there will be an industry data-specification process that enables the relevant industry to agree on the types of data that will be covered, as well as mechanisms for transfer and security protocols. Notably, the Consumer Data Right will commence in the banking sector (i.e. Open Banking), followed by the energy and telecommunication sectors.

Because the specific way chosen to ensure interoperability and data portability is going to be a crucial element for the success or failure of every regulatory intervention providing for data sharing, a clear standardization-oriented approach in developing present and future regulation is highly recommended. Since several market players and incumbents have a strong commercial incentive to undercut a sound data sharing regime, policy makers shall duly avoid enacting cumulative, redundant and potentially contradictory regulations or disregarding their implementation. Furthermore, firms and public bodies risk facing serious difficulties in assessing how to comply with such an heterogenous legal framework involving data sharing.

5.3.2 The turn of standardization: the lesson of the PSD2

Despite the several legislative initiatives put forward so far by the European Commission, a clear view as to who should define APIs and how they should be designed is still lacking. This is an extremely sensitive issue as the success of any data sharing regulation is mainly dependent on the way the industry will implement its technicalities. Indeed, interoperability is a cornerstone to guarantee throughout the market that all undertakings could take advantage and leverage data access regimes.

[858] Australian Government (2018a). For a comparison with the European GDPR, see Esayas and Day (2018).

As the production and delivery of data-enabled services requires different operators in the value chain to cooperate and interact, a European common data space will not reach its full potential without the development of open standardized APIs that enhance interoperability and simplify the exchange of and access to data between market players. So far, the European Commission has encouraged firms throughout the Internal Market "to consider using open, standardized and well-documented APIs more broadly. This could include making data available in machine-readable formats and the provision of associated metadata."[859] However, private undertakings are basically free to develop APIs and portability tools to comply with regulatory requests according to their own business convenience, which might not be aligned with overall competitive goals of underlying regulations.[860] Hence, the concern stemming from this scenario is that firms will try to comply in autonomous and non-standardized ways with new regulatory data sharing obligations, thereby ultimately precluding a sound free flow of data within the Internal Market. On top of that, since data holders often retain strong commercial incentives to share as few data as possible with third parties and the implementation process of access rules is inherently complex, there is a strong risk that incumbents could systematically develop and adopt APIs so subtly designed as to prevent full interoperability with competitors' interfaces[861]. Against this background, the European Commission has started advocating "the development of open standards that increase competition, enhance interoperability and simplify the exchange of and access to data between market players."[862]

The case of account data portability can provide a useful insight into how to prevent these risks as its implementation process is at a more advanced stage compared with other initiatives. The PSD2 establishes that technical implementation of the XS2A rule must be carried out through a "Level 2 legislative process", according to which the European Banking Authority has been charged with the task of developing five sets of guidelines and six drafts of Regulatory Technical Standards (RTS).

The drafting process of RTS demonstrated how difficult it had been to strike a balance between different interests and goals[863]. Once this lengthy process had been concluded, the following challenge has been the definition of the APIs that will be used effectively by banks and payment providers. In the aftermath of PSD2 there was no general agreement among market players whether

[859] European Commission (2018b), 9.
[860] An attempt to provide some guidance on APIs definition is represented by the digital document issued by the World Wide Web Consortium (2017), a network co-funded by the European Commission under the Competitiveness and Innovation Framework Programme.
[861] Richter and Slowinski (2019), 17, arguing that the future development of markets and dependencies between companies depends significantly on technical interoperability standards that enable large-scale data sharing, hence the crucial question is how proprietary the standard is and how it is set.
[862] European Commission (2018e), 7-8.
[863] See Chapter 3, Section 3.3.5.

to create them in a standardized way or not[864]. Whereas some market players have shown strong disagreement on setting up standardized APIs, outlining that this could hinder innovation as well as competition by normalising business opportunities across the market, on the other hand, the functioning of a common data space would be undermined if undertakings were free to adopt their own APIs, conveniently designed according to their own commercial incentives without taking into account overall interoperability needs of the market.

Moreover, the European Parliament took a strong stance in favour of the creation of a set of standardized APIs that undertakings could use as a shared language and highlighted the importance of interoperability for the rise of FinTech innovation[865].

So far, the retail banking sector proved to be the most responsive to such call. More specifically, APIs standard-setting initiatives have been emerging throughout Europe. For instance, the 'Berlin Group' has gained attention among policy makers as an interoperability standards and harmonization initiative lead by a pan-European standardization body, which involves banks, payment associations, banking associations, interbank processors, and payment schemes with the objective of setting open and common standards in the inter-banking domain. Namely, a task force of the group named NextGenPSD2 has been established with the goal of creating an open, common and harmonized XS2A communications across the markets involved. It currently gathers 54 industry players in the supply-side (i.e. ASPSPs, banking associations, payment associations, payment schemes, and interbank processors). The final goal of this initiative is to offer a harmonized, open and interoperable set of APIs suited to enable a smooth functioning of the XS2A. By building on the joint effort of several market players, the project aims at reducing complexity and fragmentation risks, improving market access for TPPs, saving operational costs for undertakings and enabling faster services for customers. Further, in order to avoid potential risks of moral hazard and collusion by supply-side participants to the detriment of newcomers, an advisory board has been established. By taking part in this body, TPPs can oversee and take active part in the development and drafting of NextGenPSD2 standards.

In parallel to the Berlin Group, within the European Union some countries have started their own standardization initiatives as well. In Poland, a partnership between the Polish Bank Association and Polish financial entities has launched the PolishAPI project with the goal of lowering down the costs of implementation of the PSD2. Between April 2018 and February 2019, a set of open, common and universal APIs has been developed drawing on the best practices and achievements of the Polish

[864] Milanesi (2017), 76.
[865] European Parliament (2017), 13.

payment and banking sector[866]. In the same vein, the Slovak Banking Association has been working since 2017 on an API standard enabling secure communication between TPPs and ASPSPs and between payment service users and ASPSPs. Furthermore, a great deal of attention has been put to ensure the integrity of shared data and the identity of the communicating entities[867]. A third standardization initiative has been led by STET, a company owned by six major French banks that operates as a Systematically Important Payment System. In January 2019 STET released the latest version of its PSD2 API which builds on the Berlin Group work and aims to allow a secure and easy-to-use functioning of the XS2A framework[868].

On top of these privately led initiatives, the UK Open Banking project stands out as a noteworthy best practice of mandated APIs standardization for the whole financial industry[869]. As mentioned above, the UK Consumer and Market Authority entrusted the nine largest banks with the task of setting an Open Banking Standard together with representatives of stakeholders, consumers and SMEs under the supervision of a special authority (i.e. the Open Banking Implementation Entity).[870] Moreover, the UK Financial Conduct Authority committed to take stock of Open Banking to drive forward the development of so-called Open Finance[871]. By this concept is meant the extension of Open Banking APIs to other financial products (cash savings accounts, mortgages, insurance, and pensions). Allegedly, this development promises to improve the financial health of consumers and businesses by enabling them to see all of their accounts from different suppliers in one place and helping them to manage savings, loans, investments and pensions. On a more technical note, Open Finance could facilitate access to financial advice as well as switching products or transfer of funds between products to maximise the interest received in an automatic way[872].

Given the ambitious goals of such initiative, it should not come as a surprise that the UK Open Banking initiative has been taken as the main reference point by Australian policy makers and regulators. Within the proposal to introduce a new Consumer Data Right that ensures a general data portability right for consumers, the Australian Government has chosen the banking sector as the first industry to experience the application of the new right. With regards to the banking industry data-specification process, the Australian Competition and Consumer Commission (ACCC) in consultation with the Office of the Australian Information Commissioner (OAIC) will develop draft

[866] Polish Bank Association (2019).
[867] Slovak Banking Association (2017).
[868] STET (2019).
[869] Colangelo and Borgogno (2020).
[870] UK Competition and Markets Authority (2017).
[871] Financial Conduct Authority (2019), 22. An advisory group was established in 2019 and met for the first time on 29 July 2019.
[872] Open Data Institute and Fingleton (2019), 37-38.

rules for Open Banking, while the Data Standards Body will be responsible for setting technical standards[873]. Namely, Data61 has been appointed as the interim data standards body by the federal government. Data61 is entrusted to develop open standards that enable consumers to safely access data about them held by businesses and direct this information to be transferred via APIs to trusted, accredited third parties of their choice. The ACCC will certify technical Data Standards as meeting the requirements for the right. In the first instance Australia's four major banks had to implement an open banking standard by 1 July 2019, while all other banks were mandated to comply with these standards by 1 July 2020.

5.3.3 Compensating data access: are FRAND terms a solution?

Another key issue stemming from data sharing regimes is the compensation to which the data holder that built its own data set is entitled in exchange for providing access. In this regard, the European Commission put forward the idea of relying on FRAND terms in the Communication "Building a European Data Economy" as well as in the "FinTech Action plan" as a possible way to set remuneration rules for the data accessed by third parties[874].

As far as FRAND terms are concerned, competition law experience gained throughout its vexed analysis involving standards can provide useful insights. Indeed, in the realm of intellectual property, these licensing rules have been supported by competition authorities and designed by standard-setting organisations (SSOs)[875]. Basically, standard essential patents (SEPs) holders are requested to license their patents to any standard's implementer on FRAND terms. However, there is no consensus on either the meaning of the acronym or on the conditions and procedures which need to be followed in order to comply with a FRAND commitment. Given that there are no generally agreed-upon tests to determine whether a license does satisfy a FRAND commitment, an impressive wave of disputes has arisen in several jurisdictions.

Against this background, the European Commission made explicit reference to the *Huawei* judgement to draw inspiration for establishing a workable framework of obligations to reach a data sharing

[873] See Australian Government (2017).
[874] European Commission (2017a), 13; European Commission (2018e), 7. See also European Commission (2018a), 15, with reference to compensation for data sharing: "different options exist, namely limiting the remuneration to a pro rata recovery of the costs incurred in the production, preservation and dissemination of the data – only exceptionally combined with allowing a fair return on investment – and limiting the remuneration to, at maximum, the costs related to the dissemination of the data, considering that the costs of production and preservation of the data depending on the instant case may have already been covered by other revenue streams. The choice of the option could be linked to the public interest purpose pursued and the specificities of the social need it aims to fulfil."
[875] For an overview, see Borgogno and Colangelo (2019).

agreement based on competition law[876]. In *Huawei* the CJEU did not provide any help on how to determine FRAND terms but, instead, laid down a procedural framework for potential licensees and licensors formalising the stage of a negotiation aimed at reaching a consensus between the parties on a FRAND license. Both the asset holder and the access seeker are incentivised to comply with the above-mentioned procedure since the former will be sheltered from antitrust remedies and, simultaneously, the latter will be protected from the threat of injunctions.

In this respect, the European approach significantly differs from the US one. Indeed, whereas the European view relies on a set of conditions that assess the FRAND-compliance of the licensing parties during the negotiations, in order to leave the actual determination of FRAND rates to the parties, the US methodological approach aims at developing tools that allow courts to define royalty rates. The literature supports the European way, arguing that by promoting cooperative solutions, thus moving the parties away from the courtroom and toward the negotiating table, the *Huawei* choreography is expected to result more likely in economically efficient royalty rates[877].

However, due to the set-up of the specific case, the CJEU left a relevant number of issues unresolved, concerning inter alia the very existence of a dominant position in relation to SEPs, the possibility of applying the framework to non-competing entities, the optimal way to solve all those issues arising from the implementation of the parties' duties (e.g. the right order to follow in scrutinizing the FRAND nature of offers and counter-offers, the timing and basis for counter-offers), and the definition of FRAND terms. Indeed, the European Commission has considered the framework as still very incomplete and has released a Communication with the aim setoff setting out key principles that foster a predictable framework for SEPs[878].

The fact that litigations around FRAND terms are still widespread world-wide demonstrates how far from an easy solution for the compensation issue this kind of remedy is. Despite the CJEU's remarkable efforts to remove several roadblocks, many shadows still threaten the horizon of the standard-setting community and, even in the EU, not every national court has followed the *Huawei* framework.

Taking this brief overview of case law involving FRAND terms into consideration, it is better to duly evaluate whether relying on such a complex framework could actually prove useful in dynamic and

[876] European Commission (2017b), 21 and 38; *Huawei Technologies Co. Ltd v. ZTE Corp.*, Case C-170/13, EU:C:2015:477.
[877] See, e.g., Epstein and Noroozi (2017); Pentheroudakis and Baron (2017).
[878] European Commission (2017d).

fast-changing data-driven markets or, instead, just give rise to a flood of litigation between data holders and access seekers[879].

5.4 Concluding remarks: four lessons for data governance policies

Smooth access to data is crucial for technological innovation to thrive. Hence, policies affecting the movement of data should be critically assessed and carefully designed[880]. Moreover, the dependence of IoT and AI applications on the enormous diversity of data sources requires serious efforts to ensure interoperability and format standardization[881].

APIs are the technical gateways of the arising data-driven economy and have been identified as a key enabler of interoperability among private and public undertakings. As the flourishing of highly innovative markets based on IoT and AI is increasingly dependent on a sound data sharing framework, a systematic adoption of open and standardized APIs by firms and developers will be crucial to promote competition and innovation. The European Commission, as part of its Digital Single Market Strategy, has been working on several data sharing instruments which, even if different in terms of rationale, scope and competitive impact, share a common reliance on APIs.

The right to data portability enshrined in the GDPR has been praised as a remarkable novelty able to foster control rights of individuals as well as to boost competition among data holders.[882] Nevertheless, its potential is hindered by the lack of actual interoperability initiatives driven by regulators, thereby leaving private undertakings fully free to develop their own instruments, as Microsoft, Google, Twitter and Facebook have already done with the Data Transfer Project.[883] At the same time, a Regulation to ensure a free flow of non-personal data within the Internal Market has been recently enacted. Despite some normative drawbacks, the initiative clearly relies on a framework of suitable APIs as a cornerstone to build up a data common market.

In the meantime, sector-specific data sharing legislative instruments have surfaced as well. First and foremost, the access to account rule introduced by the PSD2 represents a compelling regulatory intervention explicitly designed to unlock competition in retail banking through a sector-specific data

[879] For an analysis of FRAND commitments in the data sharing context, see also Heim and Nikolic (2019); Richter and Slowinski (2019).
[880] See Poullet (2018), questioning the suitability of the GDPR to deal with AI. See also Ferracane, Kren, and van der Marel (2018); and Ferracane and van der Marel (2018), providing empirical evidence on the economic impact of data policies which restrict the domestic use of data and the flow of data across borders.
[881] European Commission (2018c), 7.
[882] World Bank (2021), 205; Borgogno, Poncibò (2019).
[883] See Facebook, Google, Microsoft, and Twitter (2018).

portability rule. Moreover, its complex implementation process has demonstrated once and for all that, when it comes to data sharing, the technicalities enacted by market players are crucial for its success. Finally, the Directive on open data and public sector information stands out as a significant attempt to complete the picture by fostering re-use and access to publicly funded data. In sum, it becomes very clear that APIs have been identified by the European Commission as the right tool to ensure sound access to dynamic streams of data.

As new sector-specific forms of mandated data sharing are likely to emerge in the near future, we deem it appropriate to make a call for a more consistent regulatory strategy. More specifically, any legislative instruments shall be tailored on the specific needs of each industry in order to drive private undertaking towards the adoption of standardized and interoperable solutions. In this regard, APIs represent tremendous technical instruments to deliver effective data access throughout the industry. They hold the key to unlock smooth streams of information between private and public entities by striking a balance among the multifarious interests of the firms involved.

Given the crucial role APIs are set to play in ensuring effective data sharing regimes, the most urging legal issues underpinning their implementation are still not adequately covered by a coherent legal strategy. The need to rely on standardized sets of APIs in order to achieve interoperability among firms has been mainly stressed in several pieces of soft law. Since 2013 the European Commission and the European Council have started addressing the matter in several communications, but no further binding guidance has been provided to drive a sound development of standardized APIs. Indeed, the main pieces of legislation so far enacted in the field of data sharing do not shed light on how to design standardized sets of open APIs, not to mention the future oversight of private regulation initiatives. The only exception is the Open Data and Public Sector Information Directive, which specifically mandate public bodies to adopt suitable and well-designed APIs[884].

Such a lack of detailed provisions represents a serious drawback of the emerging European legal framework involving data sharing. The substantial competitive impact generated by a smooth data flow within the internal market, it is very likely to radically disrupt and innovate a broad range of traditional industries. Against this backdrop, leaving undertakings completely free to develop their own instruments to deliver data portability raises many risks of moral hazard and exploitative conducts which could ultimately undermine the project of a data common market.

Furthermore, it is worth pointing out that two main distinctions between the regulatory interventions introduced so far in the EU emerge from the regulatory analysis provided in this chapter. The first

[884] Directive on open data and the re-use of public sector information, Article 5 and Recital 32.

hinges on the binding character of each sharing regime. Whereas the GDPR, the PSD2 and the Open Data and Public Sector Information Directive entrust specific data holders with a duty to share data whenever so requested, the Regulation on a framework for the free-flow of non-personal data merely provides for a general freedom to move data within the Internal Market. The second involves the scope of the different mechanisms designed by the European legislator. Notably, whereas the XS2A rule is a sector-specific rule inherently aimed at delivering data sharing within the retail financial sector, the other regimes establish general-purpose data sharing regimes that apply, with different degrees, across industries to the whole economy. In this regard, the difficult task of ensuring a proper functioning of data sharing in the market makes us wonder whether a horizontal approach can actually address the needs of each sector. Conversely, a sector-specific regulatory strategy coupled with coherent standardization frameworks would be better suited to lay the foundation for a thriving data economy.

In light of these considerations, four conclusions can be put forward. As they build on the real case regulatory experiences, they are likely to be useful for policy makers as well.

First, the lesson learned from the XS2A rule enshrined in the PSD2 and the Open Banking Initiative in the UK can serve as a blueprint for the effective and coherent development of other data sharing instruments or their follow-up implementation measures[885]. Even if it would be premature to draw any conclusion on the success of such new semi-regulatory experience, this original approach seems more likely to deliver effective results than old-fashioned *laissez-faire* strategies. Specifically, mandatory sector-specific interventions providing for a transparent adoption of standardized APIs have the potential to credibly bind both incumbents and new players to ensure an effective data interoperability. Similarly to what had taken place in the telecommunication industry[886], policy makers shall encourage or, if necessary, mandate private entities to run APIs standardization initiatives under open and strictly oversight conditions. The success of this private-public coordination will likely be crucial to deliver an actual level playing field within the much-awaited data common market. Notably, this move would improve both access to privately held data as well as public information as it focuses on delivering effective data flows between all undertakings.

Second, rather than running the risk of mandating poorly designed and inadequate forms of access rules, a sound regulatory approach to data sharing shall build on privately led APIs standardization

[885] As acknowledged by European Commission (2018a), 11, "[t]his has been the case in the financial sector where the access to certain bank data, via the use of well-designed application programming interfaces, has opened up for a whole new ecosystem of financial services like personalised advice on daily spending patterns, all under the control and management of the financial institutions that would not, otherwise, offer such services."

[886] As to the relationship between competition law and regulation within the telecommunication sector, see: Geradin D. and Kerf M. (2003) 316.

initiatives able to target consistently the needs and complexities of each industry. In this regard, the recent activity carried out by the newly established EU Support Centre for data sharing under the Connecting Europe Facility Programme is worth of appreciation and shall replicated consistently at the level of national states in order to provide a more granular assistance. The Centre aims at gathering best practices related to data sharing arising from private ordering as well as transnational public partnerships in order to provide firms with the most reliable sharing strategies to comply with data access regulatory mechanisms. This kind of guidance may partially give undertakings, especially small and medium firms, relief from the costs related to legal uncertainty.

Third, any API standardization initiative encouraged or mandated by regulators shall encompass both personal and non-personal data without engaging in the tricky task of laying down a clear-cut distinction among these two concepts. Indeed, such dichotomy is likely to prove extremely challenging to apply effectively when it comes to complex sets of data generated by different sources, ultimately capable of being referred to specific individuals thanks to big data analytics and cross-referencing.

Fourth, as far as data compensation is concerned, the on-going FRAND saga laying at the interplay of intellectual property and antitrust shall serve as a warning against excessive expectation on its potential ability to solve future compensation issues arising from hypothetical duties to share data with third parties. Since the meaning of the FRAND acronym is inherently ambiguous and nebulous, there is a strong risk that a wide reliance on this expedient would trigger never-ending litigation, thereby driving up transaction costs even further. Thus, benefits and drawbacks of encompassing such commitment within the terms and conditions of standardized APIs need to be carefully evaluated before encouraging its systematic adoption.

CONCLUSION

Financial technology brings enormous benefits to the modern economy. The exponential growth of digital integration has led not only to the disruption of several industries (advertising, media, retail and wholesale business), but has also significantly affected the financial industry. Interactions between providers and users are changing due to the systematic use of application programming interfaces, enabling interoperability, smooth data sharing, and cloud computing, in addition to the changes brought about by new patterns of consumer behaviour based on smartphone usage. This new financial environment built on smooth consumer data sharing between competing providers is commonly referred to as Open Banking. Against this background, new players are aiming to exploit technological breakthroughs in order to enter the financial markets with new business models.

Policy makers and scholars have been working effortlessly to ensure that the regulatory toolbox and the competition policy are ready to reap the benefits of financial technology while minimising the new risks brought about by the digital transition for the retail market. Indeed, the bargaining power of consumers in financial markets is likely to increase or decrease depending on how the ongoing technological transition takes shape.

A clear, transparent and predictable legal framework to deal with data-related market failures is required in the current digital era. The thesis examined two main research questions: 1) what is the precise meaning, content and potential of new regulatory interventions in the realm of financial technology? and 2) what is the contribution of pro-competitive regulation to delivering a data governance framework able to nurture competition within the financial sector? The findings of the thesis will be summarised below.

A. Question 1: The new regulatory toolbox to deal with financial technology

The thesis firstly examined the economic features characterising competition within the financial sector. By drawing on the most recent scientific understanding of the competitive dynamics that are materialising in the retail banking industry, the thesis illustrated the problems arising from financial technology which will need to be addressed by policy makers in the coming years[887]. Some of the potential risks are entirely new to the financial industry, such as the risk of monopolisation by BigTechs or data spill-over effects. Meanwhile, traditional risks of the financial industry (such as

[887] Expert Group on Regulatory Obstacles to Financial Innovation (2019) 10-11.

systemic instability, information asymmetries, consumer inertia) are exacerbated by the digitalisation of transaction activities.

Firstly, the thesis noted that changing patterns of competition in the banking industry as a result of the emergence of FinTech may hinder financial stability due to regulatory arbitrage, adverse selection and moral hazards. Such concerns regarding financial stability raised by digital innovation need to be targeted from a holistic perspective, encompassing both micro-prudential and macro-prudential regulation. A sudden increase in competitive pressure can trigger instability as incumbents may take on excessive risks in order to counteract their newcomer rivals. Coordination problems affecting depositors and investors, in turn, may expose the industry to panic runs. Furthermore, maturity mismatches in FinTech lending may arise as platforms start using their balance sheets for intermediation or engage in securitisation. Conversely, liquidity mismatches may only become an issue in the unlikely event that FinTech players start holding customers' money. Moreover, the operational risk is likely to grow in importance as information sharing, outsourcing, and big data analytics become more widespread. Cybersecurity and data protection are taking centre stage as the most vulnerable parts of the financial system. On the regulatory side, legal perimeters and supervisory techniques may need to adapt for as long as FinTech business methods fall outside the scope of current legislation. Finally, the thesis clarified that any future attempt to gauge macro-financial risk arising from contagion channels, systemically important entities, excess volatility or procyclicality must consider FinTech-enabled activities.

Secondly, the thesis presented the competitive problems posed by the entry of BigTechs into the financial sector. Indeed, the presence of strong economies of scale, extreme indirect network effects, remarkable economies of scope due to the role of data as a critical input, and conglomerate effects, make digital markets highly concentrated, prone to tipping and not easily contestable. This tendency towards concentration may increase ‘too big to fail’ risks if large online platforms enter into financial services, as an idiosyncratic shock affecting a BigTech may have repercussions on the entire system. Furthermore, BigTech partnerships with incumbent banks may create new operational and financial links and dependencies.

Thirdly, the systematic digitalisation of financial transactions raises risks of discrimination, manipulation and exploitation of vulnerable customers, in addition to those traditionally related to a potential lack of financial education. Indeed, due to the high levels of opaqueness that characterise algorithm-based decisions, consumers may be exposed to ambiguous and overly complex decision-making mechanisms. Furthermore, persons who are un-networked and do not use technologies for various reasons (e.g. lack of digital literacy, lack of accessibility to digital devices, lack of trust in

digitalised services) may be denied access to financial services. Moreover, the digital financial transformation increases the exposure to risks of data breaches and frauds, which may undermine confidence and represent a threat to the stability of the financial system. Hence, both cybersecurity and data protection have become sources of systemic risk in the financial system which must be addressed carefully by the regulators.

Finally, the thesis highlighted how antitrust concerns are posed by the entry of BigTechs into financial services. By exploiting their established networks, along with the massive quantities of data generated by users and their access to analytical tools and cutting-edge technologies to process customer and transaction data, large online companies are able to offer a very broad range of integrated and tailored products. Hence, BigTechs may implement anti-competitive strategies, leveraging their market power by bundling new services with traditional products, engaging in self-preferencing, or hindering access to their platforms.

Against this background, the thesis provided an initial systematisation of the experimental tools that have emerged over the last decade. In fact, in recent years we have seen a race between policy makers to overhaul their own regulatory landscapes in order to be as innovation friendly as possible. Consequently, a vast array of new tools and regulatory practices has emerged over recent years, threatening to disrupt traditional approaches to regulation. This gives rise to the need to establish the true potential of each allegedly new practice so as to avoid any confusion between original, far-reaching avenues of market regulation and the rebranding of old ideas prompted by legal marketing considerations.

The thesis positioned these new tools into a systematic framework by distinguishing three different, but not mutually alternative, strategies. Firstly, the *laissez-faire* approach leaves firms free to develop and make use of FinTech breakthroughs under the ordinary regulatory framework. This strategy does not necessarily involve a passive attitude towards digital innovation in the financial markets as regulators have to remain watchful through continuous industry supervision in order to target any potential risk ahead of time. Secondly, functional regulation entails enacting the same regulatory response to all economic activities raising identical risks. Despite the reasonableness of this strategy, the thesis was cautious in this respect as its overly rigid implementation could hinder positive innovation through misleading uses of the level playing field objective. Thirdly, the tailored regulatory strategy requires public authorities to identify the original features of specific market developments and to design pieces of regulation accordingly, tailored to the new technology-enabled functionalities. This strategy represents a Pandora's box from which the largest part of the new regulatory measures involving FinTech originates.

The thesis investigated the structure and effective functioning of the two most used tools that have come to light so far, namely regulatory sandboxes and innovation hubs. The former are worthy of consideration as they allow for services and business methods with reduced risk of regulatory exposure to be evaluated. However, policy makers need to be aware that transparency and business neutrality are crucial elements for avoiding any backfire on legal certainty and efficiency. Hubs should be seen as privileged interaction points between regulators and firms intending to overcome regulatory doubts. Their greatest asset is also their biggest weakness, as the case-by-case and cross-sectional nature of hubs is extremely time consuming for sector-specific regulators which have to engage in complex and time-consuming preliminary work to provide effective answers. Overall, these innovation facilitators are corollaries of the classic principle of proportionality that has permeated into administrative activity for decades. Most of the commotion surrounding them is, in fact, due to legal marketing considerations rather than to their truly original nature.

Building on this systematisation of current regulatory strategies, the thesis presented "pro-competitive regulation" as a new, far-reaching paradigm that promises to unlock the competitive and innovative potential of FinTech. By drawing on the experience of the PSD2 in the EU, the Open Banking and Open Finance projects in the UK, and similar measures recently enacted in Australia, Canada and in South East Asia, the thesis focused attention on the data access rule introduced in the financial sector to lower entry barriers for FinTech firms and to tackle consumer inertia. While acknowledging the need to avoid any early excitement about their success as they are still under implementation, the thesis praised them as regulatory measures, specifically tailored to curb FinTech market failures in a coherent and original way.

Rather than requiring regulators to engage in mammoth tasks (such as offering general advice to market participants in the product design and implementation process), the pro-competitive paradigm focuses on ex ante regulation in order to lay down regulatory mechanisms that can open the market up to new entrants. Market players will have to learn to use these tools to develop and test innovative services and business methods in the market. Against this backdrop, the thesis pointed out that innovation facilitators are set to perform the marginal (yet useful) task of helping regulators to adjust current rules according to the principle of proportionality.

B. Question 2: what is the contribution of pro-competitive regulation in delivering a data sharing framework able to foster competition within the financial sector?

Having presented a comprehensive systematisation of the regulatory toolbox dealing with FinTech innovation, the next research question assessed the data governance implications of the pro-competitive paradigm. Indeed, one of the most compelling developments emanating from technological innovation is represented by data uses in the financial sector. The thesis argued that pro-competitive regulation has emerged as the best tool to address the data bottleneck problem in retail banking markets.

Firstly, the thesis explained that the data bottleneck problem is a major structural factor preventing the emergence of data-enabled competition. Information is a key requirement for competing in financial services, as the entire sector is based upon information and information management. Therefore, the type of information that financial institutions have and the way in which they use it is pivotal for the potential impact of FinTechs. As keepers of customer finances, banks play a gateway role which is crucial to the viability of many FinTech business models. Whereas newcomers need to gain access to this essential information in order to steer customers towards their services, incumbents will be unwilling to share their data booty. In this respect, customers' account data can be regarded as a barrier to entry for newcomers of equal importance as traditional ones already targeted by regulators (such as capital structure requirements, cost of funds for lending and information asymmetries between banks).

The thesis acknowledged that tackling the data bottleneck problem is beyond the scope of the existing antitrust toolbox. Indeed, competition law is inherently based on a discrete assessment of the individual case in question; therefore, antitrust enforcement seems unable to target consistently competitive challenges as broad as the needs of the FinTech revolution. When it comes to data, fulfilling the requirements of the essential facility doctrine appears problematic and, in any case, compulsory data licences would be difficult to manage. This means that regulatory intervention alone may not be adequate to make competition and innovation thrive in the retail banking market as well as in the payment system. Rather, antitrust enforcement must be considered a complementary tool required to address more subtle forms of anti-competitive practices that cannot be dealt with through regulatory implementation mechanisms.

Against this background, the thesis delved into the legislative experience of the Revised Payment Service Directive (PSD2). Payment services are at the forefront of competitive issues arising from the data bottleneck problem. Indeed, as in most financial services, the payments industry is highly driven by information. Notably, the thesis argued that the access to account rule enshrined in the

PSD2 represents the most advanced example of a pro-competitive regulatory intervention in the field of financial technology. In this scenario, by forcing banks to share payment information with third parties at the request of their customers, the PSD2 can foster competition in the retail banking markets. Additionally, such a sector-specific intervention laid the foundations for a transition towards an Open Banking environment. From a competition policy perspective, this initiative is based upon sound economic reasoning as it involves a general duty for incumbents to grant access, on a non-discriminatory basis, in favour of new entrants which would otherwise be precluded from providing their services.

The thesis pointed out that the implementation process of the mechanisms entrusted with the task of executing the PSD2's access-to-account (XS2A) rule is likely to be crucial to its future success. Interoperability is a priority for the FinTech market and standardisation initiatives aimed at defining shared, open APIs are being encouraged in Europe and in other countries (e.g. Australia, Canada, Mexico, Japan, Singapore). In this regard, the approach of the XS2A rule enshrined in the PSD2 and the Open Banking project in the UK stands out as a best practice for the development of other pro-competitive data sharing regimes and their follow-up implementation measures. Similarly, as the regulatory technical standard drafting saga in the EU made crystal clear, a coherent framework of regulation ensuring high levels of consumer protection and data integrity across Open Banking ecosystems is crucial for earning consumer trust.

Furthermore, the thesis argued that the Open Banking Initiative by the Competition and Markets Authority in the UK could serve as a blueprint for the effective and coherent development of the data access regime in other jurisdictions. However, since this antitrust enforcement remedy is still ongoing, it would be premature to draw any conclusions on its success. This experience is proving that the complementary application of regulatory and competition law enforcement can play a key role for the future of data-enabled services in the FinTech arena. In this regard, the thesis argued that antitrust authorities, together with financial supervisors, are emerging as the most suitable public bodies, together with financial supervisors, to oversee the adoption of standardised APIs in Open Banking ecosystems.

The thesis then moved on to consider the impact on competition policy of pro-competitive regulation in the realm of financial data. In particular, consumer-focused remedies designed to enhance customer engagement are becoming topical in driving effective competition on the markets. The thesis argued that policy makers are increasingly turning to demand-side interventions to enhance competition by improving consumer engagement. Indeed, while competition authorities often focus their efforts on ensuring that the supply side of a market is functioning competitively, a poorly-functioning demand-

side of a market can increase the market power of suppliers and/or lead to competition occurring along dimensions that are less relevant to consumer welfare. In this regard, pro-competitive data sharing regimes can contribute to increasing the empowerment of individuals with regard to their own data and to opening up new markets for data-enabled services to the benefit of consumer welfare.

The thesis highlighted that the European Union has started to combat information asymmetries and the lack of consumer awareness by opening up the financial markets to real time data access and tailored comparison tools. The introduction of access-to-account rules as well as API standardisation enshrined in the PSD2 and in the UK Open Banking project highlights the rise of a new regulatory paradigm strongly focused on consumer engagement. Rather than just protecting fragile consumers, these regulatory interventions give individuals more control over their data and digital consumption choices, thereby implying a significant shift in the way in which policy makers conceptualise digital consumers. Indeed, a well-functioning market requires consumers to be able to access the correct information, to assess that information, and to act on their assessment in choosing products and providers.

However, the thesis acknowledged that some significant drawbacks of the proposed data sharing regime cannot be ignored and must be tackled head-on in order for Open Banking to deliver on its promises. In particular, the increasing digitalisation of financial transactions raises concerns about the discrimination, manipulation and exploitation of vulnerable consumers. Indeed, a lack of accountability and high levels of opaqueness characterising algorithm-based decisions may make consumers unable to exercise their choices effectively. Furthermore, there is a risk that those not having access to the internet will not be able to benefit from these types of intervention. Moreover, facilitated forms of data sharing increase the exposure to risks of cyber-attacks, data breaches and electronic fraud, which are rightly perceived as primary barriers to consumers considering Open Banking.

Furthermore, the thesis addressed the risk that the entry of BigTechs into financial services due to pro-competitive interventions may strengthen their market power in the financial markets. Notably, by leveraging their data advantage in digital markets and their privileged access to advanced technologies, BigTechs may quickly scale-up in the financial markets and entrench the dominance of their ecosystem by combining financial and non-financial services and engaging in self-preferencing. The thesis criticised several proposals and recommendations aimed at providing greater control on practices and business models of gatekeeping online platforms. The thesis argued that crafting an *ex ante* regulation tailored to platform-based technology companies could be counterproductive and at odds with the pro-competitive aim of the PSD2. Indeed, in the banking sector, financial institutions -

rather than BigTechs - play the role of gatekeepers. As FinTech start-ups seem more likely to work alongside incumbent banks rather than to compete with them, imposing entry barriers to BigTechs may remove the only effective source of competitive pressure for traditional banks.

The thesis highlighted that it is currently not possible to predict if and how they will be able to disrupt the retail banking markets. Furthermore, there will always be room for antitrust enforcement to challenge potential anti-competitive practices carried out by incumbents as well as new entrants. As we are still at an early stage of the transition to Open Banking, priority should be given to a clear evidence-based approach in designing future regulatory policies that are likely to have a long-term effect on the financial markets.

Finally, the thesis argued that the lessons learned from the pro-competitive data access rule enshrined in the PSD2 and the Open Banking Initiative in the UK may serve as a blueprint for the effective and coherent development of other data sharing instruments or their follow-up implementation measures. As several market deficiencies affecting financial data governance are shared with other sectors of the economy, the PSD2 experience can serve as a useful lesson for speeding up new pro-competitive data governance interventions. By looking at the European regulatory initiatives on data sharing other than the access to customer account data rule (right to personal data portability, free flow of non-personal data, re-use of government data), the thesis noted that the systematic adoption of open and standardised APIs will be crucial for promoting the success of Artificial Intelligence (AI) and Internet of Things (IoT) innovation.

BIBLIOGRAPHY

A. SCIENTIFIC MATERIALS

Academy of Internet Finance (Zhejiang University) and Cambridge Centre for Alternative Finance (2018) *Global FinTech Hub Report*, https://www.jbs.cam.ac.uk/faculty-research/centres/alternative-finance/publications/2018-global-fintech-hub-report/#.X6uWlmhKhik

Aggarwal N. (2020), *The Norms of Algorithmic Credit Scoring*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3569083

Akman P. (2017) *The Theory of Abuse in Google Search: A Positive and Normative Assessment under EU Competition Law*, 2 University of Illinois Journal of Law, Technology and Policy 301.

Allen H. J. (2020), *Sandbox Boundaries*, Vanderbilt Journal of Entertainment & Technology Law (forthcoming).

Amstad M. (2019), *Regulating Fintech: Objectives, Principles, and Practices*, *Asian Development Bank Institute Working Paper Series* No 1016, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3541003

Anagnostopoulos I., *Fintech and regtech: Impact on regulators and banks*, 100 Journal of Economics and Business 7.

Antonucci, A. (2012), *Diritto delle banche* (Giuffré).

Armour J., Awrey D., Davies P., Enriques L., Gordon J. N., Mayer C., and Payne J. (2016), *Principles of Financial Regulation* (Oxford University Press).

Armour J. (2015), *Making bank resolution credible*, in Niamh Moloney, Eilis Ferran, and Jennifer Payne (eds) *The Oxford Handbook of Financial Regulation* (Oxford University Press).

Armour J., Enriques L., Ezrachi A., Vella J. (2019) *Putting Technology to Good Use for Society: The Role of Corporate, Competition and Tax Law*, Oxford Legal Studies Research Paper No. 15, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3287696.

Armour J., Gordon J. (2014), Systemic Harms and Shareholder Value, 6 Journal of Legal Analysis

35.

Arner D.W., Zetzsche D.A., Barberis J., Buckley R.P. (2019) *The Identity Challenge in Finance: From Analogue Identity to Digitized Identification to Digital KYC Utilities*, European Business Organization Law Review 20, 55-80.

Arner D.W., Barberis J., Buckley R.P. (2017) *FinTech, RegTech, and Reconceptualization of Financial Regulation*, 37 Northwestern Journal of International Law and Business, 371.

Arner D. W., Barberis J. N., and Buckley R. P., Zetzsche Dirk A. (2017), *Regulating a Revolution: From Regulatory Sandboxes to Smart Regulation* 23 Fordham J. Corp. & Fin. L. 3147.

Arner D. W., Barberis J. N., and Buckley R. P. (2016), *The Evolution of FinTech: A New Post-Crisis Paradigm?*, (2016) 47 Georgetown Journal of International Law 1271.

Athanassiou P. L. (2018), *Digital Innovation in Financial Services: Legal Challenges and Regulatory Policy Issues* (Alphen aan den Rijn: Wolters Kluwer)

Awrey D. and Van Zwieten K. (2019), *Mapping the Shadow Payment System*, Cornell Legal Studies Research Paper No. 44, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3462351&download=yes

Awrey D. and Van Zwieten K. (2019), *The Shadow Payment System*, 43 J Corp L 775, 814.

Barberis J., Arner Ross D.W., Buckley P. (2019) *The RegTech Book* (Wiley).

Baxter L.G. (2016) *Adaptive Financial Regulation and RegTech: A Concept Article on Realistic Protection for Victims of Bank Failures*, 66 Duke Law Journal 567 (2016)

Bain & Company (2018) *Coping with the Challenge of Open Banking*, https://www.bain.com/insights/coping-with-the-challenge-of-open-banking

Baker McKenzie (2019) *The New Swiss FinTech License*, https://www.bakermckenzie.com/en/insight/publications/2019/03/new-swiss-fintech-license

Bar-Gill O. (2012) *Competition and Consumer Protection: A Behavioral Economics Account*, in Swedish Competition Authority, *The Pros and Cons of Consumer Protection*, http://www.konkurrensverket.se/globalassets/english/research/readthebook23mb.pdf

Barrett C. (2019) *Could Alexa, Siri and Google make us smarter savers?*, Financial Times (October 25) https://www.ft.com/content/ec1b0da8-f584-11e9-a79c-bc9acae3b654

Basso A., Bon J., Tasker B., Timan N., Walker M., and Whitcombe C. (2018), *Recent Developments at the CMA: 2017-2018*, 53 Review of Industrial Organization 615, 629.

Batikas M., Bechtold S., Kretschmer T., and Peukert C. (2020*) European Privacy Law and Global Markets for Data*, CEPR Discussion Paper No. 14475, http://cepr.org/active/publications/discussion_papers/dp.php?dpno=14475

Beckert W., Siciliani P. (2018) *Protecting vulnerable consumers in "switching markets"*, IFS Working Paper W18/23, https://www.ifs.org.uk/publications/13477

Ben-Shahar O. (2009) *One-way contracts: consumer protection without law*, John M. Olin Law & Economics Working Paper 2009, chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=5068&context=journal_articles

Benöhrp I. (2013) *EU Consumer Law and Human Rights* (Oxford University Press: Scholarship Online 2013).

Benzell G., Lagarda G., and Van Alstyne M. (2017), *The Impact of APIs on Firm Performance*, Boston University Questrom School of Business Research Paper No. 2843326, https://ssrn.com/abstract=2843326

Ben-Shahar O. and Schneider C.E. (2010), *The Failure of Mandated Disclosure*, 159 University of Pennsylvania Law Review 647.

Ben-Shahar O. and Bar-Gill O. (2013) *Regulatory Techniques in Consumer Protection: A Critique of European Consumer Contract Law*, 50 Common Market Law Review 2013, 109-126, https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=5068&context=journal_articles

Berg T., Burg V., Gombović A., and Puri M. (2020), *On the Rise of FinTechs – Credit Scoring using Digital Footprint*, Michael J Brennan Irish Finance Working Paper Series Research Paper No 18-12, Forthcoming on The Review of Financial Studies, https://ssrn.com/abstract=3163781

Berner R. and Judge K. (2019), *The Data Standardization Challenge*, ECGI Working Paper Series in Law No. 438, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3323719

Bessen J., Impink S.M., Reichensperger L., and Seamans R. (2020) *GDPR and the Importance of Data to AI Startups*, Boston University School of Law, Law & Economics Series Paper No. 20-13 https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3576714

Bömer M. and Hannes M. (2018), *Why fintechs cooperate with banks—evidence from Germany*, 107 ZVersWiss 359.

Borgogno O. (2017), *Why is the Canadian Banking System More Resilient than the U.S. System? A lesson for European competition policy*, 1 Osservatorio del diritto civile e commerciale.

Borgogno O. and Colangelo G. (2020), *Data, Innovation and Transatlantic Competition in Finance: The Case of the Access to Account*, 31 European Business Law Review 4, 573 – 610.

Borgogno O. and Colangelo G. (2020a), *Antitrust analysis of two-sided platforms: the day after AmEx*, 15 European Competition Journal 1, 107-135.

Borgogno O. and Colangelo G. (2020b), *Consumer Inertia and Competition-Sensitive Data Governance: The Case of Open Banking*, 9 Journal of European Consumer and Market Law 4.

Borgogno O. (2019), *Usefulness and Dangers of Smart Contracts in Consumer Transactions* in Larry A DiMatteo, Michel Cannarsa, and Cristina Poncibò (eds), *The Cambridge Handbook of Smart Contracts, Blockchain Technology and Digital Platforms* (Cambridge University Press)

Borgogno O. and Colangelo G. (2019a), *Data sharing and interoperability: Fostering innovation and competition through APIs*, 35 Computer Law & Security Review 5.

Borgogno O. and Colangelo G. (2019b), *Standards, patents, and FRAND commitments*, DEEP-In Policy Paper.

Borgogno O. and Poncibò C. (2019), *The Day After Tomorrow of Banking - On FinTech, Data Control and Consumer Empowerment*, in Aggarwal N., Eidenmüller H., Enriques L., Payne J., Zwieten K. (eds.), *Autonomous Systems and the Law* (Nomos)

Botta M., Wiedemann K. (2019), To discriminate or not to discriminate? Personalised pricing in online markets as exploitative abuse of dominance, European Journal of Law and Economics

Bourreau M. and de Streel A. (2019), *Digital Conglomerates and EU Competition Policy*, 14 (2019) http://www.crid.be/pdf/public/8377.pdf

Brady K. (2019) *Hundreds of German banks make Apple Pay service available for first time*, The Local, 19 December, https://www.thelocal.de/20191211/hundreds-of-german-banks-make-apple-pay-service-available-for-first-time

Brainard L. (2017), *Where Do Banks Fit in the FinTech Stack?*, Speech at Northwestern Kellogg Public-Private Interface Conference on "New Developments in Consumer Finance: Research & Practice", https://www.federalreserve.gov/newsevents/speech/files/brainard20170428a.pdf

Brodsky L., Oakes L. (2017) Data sharing and open banking, McKinsey & Company Report, https://www.mckinsey.com/industries/financial-services/our-insights/data-sharing-and-open-banking

Brummer C. and Gorfine D. (2014) *FinTech: Building a 21st-Century Regulator's Toolkit*, Milken Institute, https://milkeninstitute.org/sites/default/files/reports-pdf/3.14-FinTech-Reg-Toolkit-NEW.pdf

Brummer C., Yadav Y. (2019) *Fintech and the Innovation Trilemma*, 107 Georgetown Law Journal, 235.

Boot A.W. (2017) *The Future of Banking: From Scale & Scope Economies to Fintech*, 2 European Economy 77.

Buckley, Arner, Zetzsche, Weber (2020) *The road to RegTech: the (astonishing) example of the European Union*, 21 Journal of Banking Regulation, 26-36.

Butler T. (2017) *Towards a Standards-Based Technology Architecture for RegTech*, 45 Journal of Financial Transformation 49.

Buchak G., Matvos G., Piskorski T., and Seru A. (2018), *Fintech, regulatory arbitrage, and the rise of shadow banks*, 130 Journal of Financial Economics 453.

Buckley R. P., Arner D. W., Zetzsche D. A., and Selga E. (2020), *The Dark Side of Digital Financial Transformation: The New Risks of FinTech and the Rise of TechRisk*, Singapore Journal of Legal Studies (forthcoming).

Buckley R. P., Arner D., Veidt R., and Zetzsche D. (2019), *Building Fintech Ecosystems: Regulatory Sandboxes, Innovation Hubs and Beyond*, European Banking Institute Working Paper Series No 53, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3455872

Bush (2020) The P2B Regulation (EU), *2019/1150: Towards a 'Procedural Turn' in EU Platform Regulation?*, 9 Journal of European Consumer and Market Law 133.

Cambridge Centre for Alternative Finance (2016), *Sustaining momentum – the 2nd European alternative finance industry report*, https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2016-european-alternative-finance-report-sustaining-momentum.pdf

Cannon B., Chung H. (2015) *A Framework for Designing Co-Regulation Models Well- Adapted to Technology-Facilitated Sharing Economies*, 31 Santa Clara High Tech. L.J. 31 (2015): 23

Capdeville L., J. (2015), *La réforme du crowdfunding en droit français: les aspects du droit bancaire*, in Revue générale du droit, Études et réflexions no. 4, https://www.revuegeneraledudroit.eu/wp-content/uploads/ER2015_4.pdf

Cappiello, S. (2015) *The interplay between the EBA and the Banking Union*, EUI Working Papers RSCAS n. 77, https://cadmus.eui.eu/bitstream/handle/1814/37378/RSCAS_2015_77.pdf

Capriglione, F. and V. Lemma (2018), *Commento sub art. 106*, F. Capriglione (a cura di), Commentario al testo unico delle leggi in materia bancaria e creditizia (Cedam).

Cardenas J. (2020) *Corporate Venture Capital Investment in Fintech: A Transatlantic Perspective*, Stanford-Vienna TTLF Working Paper No. 56, https://law.stanford.edu/publications/no-56-corporate-venture-capital-investment-in-fintech-a-transatlantic-perspective/

Carney M., *Building the Infrastructure to Realise FinTech's Promise*, Speech at the International FinTech Conference, https://www.bankofengland.co.uk/-/media/boe/files/speech/2017/building-the-infrastructure-to-realise-fintechs-promise.pdf.

Castro Carvalho A.P., Hohl S., Raskopf R., and Ruhnau S. (2017) *Proportionality in banking regulation: a cross-country comparison*, FSI Insights on policy implementation no. 1, https://www.bis.org/fsi/publ/insights1.pdf

Chazan G., Espinoza J. (2020) *Tech companies face clampdown in Germany over competition fears*, Financial Times (February 4), https://www.ft.com/content/39559796-4698-11ea-aee2-9ddbdc86190d

Chiu I. H-Y (2017), *The Disruptive Implications of Fintech-Policy Themes for Financial Regulators*. 21 Journal of Technology Law & Policy 55.

Claessens S., Frost J., Turner G., and Zhu F. (2018), *Fintech credit markets around the world: size, drivers and policy issues*, BIS Quarterly Review, https://www.bis.org/publ/qtrpdf/r_qt1809e.htm

Cockburn I.M., Henderson R., and Stern S. (2019), *The Impact of Artificial Intelligence on Innovation*, in A.K. Agrawal, J. Gans, and A. Goldfarb (eds.), *The Economics of Artificial Intelligence* (University of Chicago Press)

Coffee J. (2011), *Systemic Risk After Dodd-Frank: Contingent Capital and the Need for Regulatory Strategies Beyond Oversight*, 111 Columbia Law Review 795.

Coglianese C. (2018) *Optimizing Regulation for an Optimizing Economy*, 4 The University of Pennsylvania Journal of Law & Public Affairs 1.

Cohen M., Zehngebot C. (2014), "What's Old Becomes New: Regulating the Sharing Economy", 58 Boston B.J. 58, 6.

Colaert V. (2018) RegTech as a Response to Regulatory Expansion in the Financial Sector. 2018 Jun. Working Paper, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2677116.

Colangelo G. and Maggiolino M. (2018), *From fragile to smart consumers: shifting paradigm for the digital era*, 35 Computer Law & Security Review 173

Colangelo G. and Maggiolino M. (2017), *Big data as misleading facilities*, 13 European Competition Journal 264

Colangelo M., Maggiolino M. (2017) *Uber: A New Challenge for Regulation and Competition Law?*, Market and Competition Law Review 1(2): 47-68.

Cole R.A., Cumming D.J., and Taylor J. (2019), *Does FinTech Compete with or Complement Bank Finance?*, (2019) https://ssrn.com/abstract=3302975

Colomo P.I. (2019) *Indispensability and Abuse of Dominance: From Commercial Solvents to Slovak Telekom and Google Shopping*, 10(9) *Journal of European Competition Law & Practice* 532

Committee on the Global Financial System (CGFS) and the Financial Stability Board (FSB) (2017), *FinTech credit: market structure, business models and financial stability implications*, https://www.fsb.org/wp-content/uploads/CGFS-FSB-Report-on-FinTech-Credit.pdf

Consumer Financial Protection Bureau (2017), *Consumer Protection Principles: Consumer-Authorized Financial Data Sharing and Aggregation*, https://www.consumerfinance.gov/about-us/newsroom/cfpb-outlines-principles-consumer-authorized-financial-data-sharing-and-aggregation/

Cornelli G., Frost J., Gambacorta L., Rau R., Wardrop R. and Ziegler T. (2020) *Fintech and big tech credit: a new database*, BIS Working Papers No 887, https://www.bis.org/publ/work887.pdf

Crémer J., de Montjoye Y.A., and Schweitzer H. (2019), *Competition Policy for the digital era*, 98-100, http://ec.europa.eu/competition/publications/reports/kd0419345enn.pdf

Crowe M., Tavilla E., and McGuire B. (2017) *Mobile Banking and Payment Practices of U.S. Financial Institutions: 2016 Mobile Financial Services Survey Results from financial institutions in Seven Federal Reserve Districts*, Federal Reserve Bank of Boston, https://www.bostonfed.org/publications/mobile-banking-and-payment-surveys/mobile-banking-and-payment-practices-of-us-financial-institutions.aspx

Cruickshank D. (2000), *Competition in UK banking*, https://www.vocalink.com/media/1603/cruickshank_report_2000.pdf

Cunningham C., Ederer F., and Ma S. (2019), *Killer acquisitions*, Yale School of Management Working Paper, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3241707

Custers B. and Ursic H. (2016), *Big Data and Data Reuse: a taxonomy of data reuse for balancing big data benefits and personal data protection* 6 International Data Privacy Law 4

De Hert P., Papakonstantinou V., Malgieri G., Baslay L. and Sanchez I. (2018), *The right to data portability in the GDPR: Towards user-centric interoperability of digital services*, 34 Computer Law and Security Review 193

De la Mano M., Padilla J. (2018), *Big Tech Banking*, 14 Journal of Competition Law and Economics 494

Delmas-Marsalet, J. (2016), Rapport sur le monopole bancaire, Haut Comité Juridique de la Place Financière de Paris, 9, http://www.eifr.eu/uploads/eventdocs/573325f34a4c6.pdf

Demertzis M., Merler S., and Wolf G. B. (2018), *Capital Markets Union and the Fintech Opportunity*, 4 Journal of Financial Regulation 1, 157–165.

Dermine J. (2016), *Digital banking and market disruption – a sense of déjà vu*, Banque de France, Financial Stability Review, No 20, https://faculty.insead.edu/jean-dermine/documents/BanquedeFrance-DigitalBanking-Proof-2016.pdf

Di Porto F. and Ghidini G. (2020) *"I Access Your Data, You Access Mine": Requiring Data Reciprocity in Payment Services*, 51(3) International Review of Intellectual Property and Competition Law 307

Drasch B.J., Schweizer A., and Urbach N. (2018), *Integrating the 'Troublemakers': A taxonomy for cooperation between banks and fintechs*, 100 Journal of Economics and Business 26.

Drexl J. (2019), *Legal Challenges of the Changing Role of Personal and Non-Personal Data in the Data Economy*, in De Franceschi A. and Schulze R. (eds.), *Digital Revolution – New Challenges for Law* (Intersentia)

Drexl J. (2017), *Designing competitive markets for industrial data—between propertisation and access*', 8 JIPITEC 257

Dunne N. (2020) *Dispensing with Indispensability*, 16(1) Journal of Competition Law & Economics 74

Edwards F. R. and Mishkin F. S. (1995), *The Decline of Traditional Banking: Implications for Financial Stability and Regulatory Policy*, Federal Reserve Board of New York Economic Policy Review.

Eisenmann T., Parker G., and Van Alstyne M. (2011) *Platform Envelopment*, 32(12) Strategic Management Journal 1270

Enriques L., Romano A., and Wetzer T. (2020) *Network-Sensitive Financial Regulation*, The Journal of Corporation Law (forthcoming)

Enriques L. (2019), *Welcome to Vilnius: Regulatory Competition in the EU Market for E-Money*, https://clsbluesky.law.columbia.edu/2019/11/04/welcome-to-vilnius-regulatory-competition-in-the-eu-market-for-e-money/

Enriques L. (2019), *Financial Supervisors and RegTech: Four Roles and Four Challenges*, Revue Trimestrielle De Droit Financier 53.

Enriques L. and Ringe W.G. (2020) *Bank-Fintech Partnerships, Outsourcing Arrangements and the Case for a Mentorship Regime*, Capital Markets Law Journal.

Epstein R.A. and Noroozi K.B. (2017), *Why Incentives for "Patent Holdout" Threaten to Dismantle FRAND, and Why It Matters*, 32 Berkeley Technology Law Journal 1381

Erta K., Hunt S., Iscenko Z., and Brambley W. (2013) *Applying behavioral economics at the Financial Conduct Authority*, FCA Occasional Paper No. 1, https://www.fca.org.uk/publication/occasional-papers/occasional-paper-1.pdf

Esayas S. and Day A. (2018), *The Proposed Australian Consumer Data Right: A European Comparison*, 3 European Competition and Regulatory Law Review 187

Evans K. (2015), *Playing the Field. Consumers and Competition in Banking*, http://www.smf.co.uk/wp-content/uploads/2015/07/Social-Market-FoundationPublication-Playing-the-field-Consumers-and-competition-in-banking-160715.pdf (accessed 11 Nov. 2019)

Everis (2018), *Study on data sharing between companies in Europe*, https://publications.europa.eu/en/publication-detail/-/publication/8b8776ff-4834-11e8-be1d-01aa75ed71a1/language-en

Executive Office of the President (2016), *Big Data: A Report on Algorithmic Systems, Opportunity, and Civil Rights?*

Ferracane M.F., Kren J., and van der Marel E. (2018), *Do Data Policy Restrictions Impact the Productivity Performance of Firms and Industries?*, ECIPE DTE Working Paper Series No. 1, http://ecipe.org/publications/do-data-policy-restrictions-impact-the-productivity-performance-of-firms-and-industries/

Ferracane M.F. and van der Marel E. (2018), *Do Data Flows Restrictions Inhibit Trade in Services?*, ECIPE DTE Working Paper Series No. 2, http://ecipe.org/publications/do-data-policy-restrictions-inhibit-trade-in-services/

Ferrarini G. (2017), *Regulating FinTech: Crowdfunding and Beyond*, 2 European Economy 121.

Ferretti F. (2018), *Consumer access to capital in the age of FinTech and big data: The limits of EU law*, 26 Maastricht Journal of European and Comparative Law 476.

Fletcher A. (2019) Disclosure as a tool for enhancing consumer engagement and competition' [2020] Behavioural Public Policy, Behavioural Public Policy, 1-27, https://www.cambridge.org/core/journals/behavioural-public-policy/article/disclosure-as-a-tool-for-enhancing-consumer-engagement-and-competition/25226A0B4409C98FDA0ADC673984A8DD

Ford C. (2017) *Innovation and the State: Finance, Regulation, and Justice* (Cambridge University Press, Cambridge)

Franck J.U., Linardatos D. (2020) *Germany's 'Lex Apple Pay': Payment Service Regulation Overtakes Competition Enforcement*, EPoS Collaborative Research Center Transregio 224 Discussion Paper Series No. 173 https://www.crctr224.de/en/research-output/discussion-papers/discussion-paper-archive/2020/germanys-lex-apple-pay-payment-service-regulation-overtakes-competition-enforcement-jens-uwe-franck-dimitrios-linardatos/view

Frost J, Gambacorta L., Huang Y., Song Shin H., and Zbinden P. (2019), *BigTech and the changing structure of financial intermediation*, 34(100) Economic policy 761.

Fuster A., Plosser M., Schnabl P., and Vickery J. (2018), *The role of technology in mortgage lending*, NBER working paper 24500.

Gal M.S. and Aviv O. (2020) *The Competitive Effects of the GDPR*, 16 Journal of Competition Law & Economics 3.

Gal M.S. and Rubinfeld D. (2019) *Data Standardization*, 94 NYU Law Review 737

Gal M.S. and Rubinfeld D. (2017), *Access Barriers to Big Data*, 59 Arizona Law Review 339.

Geradin D., Karanikioti T., and Katsifis D. (2020) *GDPR Myopia: How a Well-Intended Regulation ended up Favoring Google in Ad Tech*, DOI: 10.1080/17441056.2020.1848059

Geradin D. (2020) *The EU Digital Markets Act in 10 points*, https://theplatformlaw.blog/2020/12/16/the-eu-digital-markets-act-in-10-points/

Geradin D. (2015) *Collective Redress for Antitrust Damages in the European Union: Is This a Reality Now?*, 16. George Mason Law & Economics Research Paper 2015, ssrn.com/abstract=2593746

Geradin D. and Kerf M. (2003), Controlling Market Power in Telecommunications (Oxford University Press, 2003).

German Commission 'Competition Law 4.0' (2019) A new competition framework for the digital economy, https://www.bmwi.de/Redaktion/EN/Publikationen/Wirtschaft/a-new-competition-framework-for-the-digital-economy.pdf?__blob=publicationFile&v=3

Gillis T. B., Spiess J. (2019) *Big Data and Discrimination*, 86 University of Chicago Law Review 459.

Global Financial Innovation Network – GFIN (2019) *Terms of Reference for Membership and Governance*, https://static1.squarespace.com/static/5db7cdf53d173c0e010e8f68/t/5db92a0d519a7150a9072bc6/1572416023693/gfin-terms-of-reference.pdf

Global Financial Innovation Network – GFIN (2020) *Cross-Border testing: lessons learned*, https://static1.squarespace.com/static/5db7cdf53d173c0e010e8f68/t/5e1ef8c3c7a87d3abb5c7bc6/1579088083585/GFIN+CBT+Pilot+lessons+Learned+publication+09012020+-+FINAL.pdf

Gola C. et al. (2019), *Shadow banking out of the shadows: non-bank intermediation and the Italian regulatory framework*, Banca d'Italia Occasional Papers 372, https://www.bancaditalia.it/pubblicazioni/qef/2017-0372/index.html?com.dotmarketing.htmlpage.language=1

Graef I. (2019), *Rethinking the Essential Facilities Doctrine for the EU Digital Economy*, TILEC Discussion Paper No. DP 2019-028, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3371457

Graef I. (2016), *EU Competition Law, Data Protection and Online Platforms: Data as Essential Facility* (Kluwer Law International)

Graef I., Husovec M., and Purtova N. (2018), *Data Portability and Data Control: Lessons for an Emerging Concept in E.U. Law*, 19 German Law Journal 1359

Graef I. and Prüfer J. (2018), *Mandated Data Sharing Is a Necessity in Specific Sectors*, 103 Economisch Statistische Berichten 298

Grunes A.P. and Stucke M.E. (2015), *No Mistake about It: The Important Role of Antitrust in the Era of Big Data*, 14 Antitrust Source 1

Gunningham N., Grabosky P. (1998), *Smart Regulation: Designing Environmental Policy* (Clarendon Press, Oxford)

Haan J. D., Oosterloo S., and Schoenmaker D. (2009), *European Financial Markets and Institutions* (Cambridge University Press)

Hachem K. (2018) *Shadow banking in China*, Annual Review of Financial Economics 10 (2018):

Harhoff D., Heumann S., Jentzsch N., and Lorenz P. (2018), *Outline for a German Strategy for Artificial Intelligence*, https://ssrn.com/abstract=3222566

Hauswald R. and Marquez R. (2003), *Information technology and financial services*, 16 Review of Financial Studies 921.

Heim M. and Nikolic I. (2019), *A FRAND Regime for Dominant Digital Platforms*, 10 Journal of Intellectual Property, Information Technology and Electronic Commerce Law 38.

Helberger, N., Zuiderveen, B. F., & Reyna, A. (2017), *The Perfect Match? A Closer Look at the Relationship between EU Consumer Law and Data Protection Law*, Common Market Law Review, 54(5), 1427.

Helgadottir D. (2020), *The conflict concerning data sharing under PSD2 and obtaining consent to share such data under GDPR*, https://www.law.ox.ac.uk/business-law-blog/blog/2020/07/conflict-concerning-data-sharing-under-psd2-and-obtaining-consent

Hijmans van den Bergh C. (2018), *ACM's view on innovation in the payments sector. How do we get the best deal?*, speech at ESB's Conversation with Regulators on Innovation in Payment Services, https://www.acm.nl/sites/default/files/documents/2018-01/speech-hijmans-van-den-bergh-at-esb-conversation-with-regulators-2018-01-19.pdf

Hoffmann J., Bakhoum M., and Beneke F. (2018), *Digital markets, mobile payments systems and development –Competition policy implications in developing countries in light of the EU experience*, Max Planck Institute for Innovation & Competition Research Paper No. 13, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3208559

Hoffmann J. (2020) Sector-specific (Data-) Access Regimes of Competitors, Max Planck Institute for Innovation and Competition Research Paper No. 20-08, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3613798

Hondius E. (2004) *The protection of the Weak Party in a Harmonised European Contract Law: A Synthesis*, 27 Journal of Consumer Policy, 245–251, DOI http://10.1023/B:COPO.0000040520.48379.60

Hurley M., Adebayo J. (2016), *Credit Scoring in the Era of Big Data*, 18 Yale Journal of Law and Technology 5.

Irani R. M., Iyer R., Meisenzahl R. F., Peydro J. L. (2018), *The Rise of Shadow Banking: Evidence from Capital Regulation*, Finance and Economics Discussion Series 2018-039, Board of Governors

of the Federal Reserve System (US), https://www.federalreserve.gov/econres/feds/the-rise-of-shadow-banking-evidence-from-capital-regulation.htm

Jabłonowska A., Kuziemski M., Nowak A. M., Micklitz H.W., Pałka P., Sartor G. (2018), *Consumer law and artificial intelligence Challenges to the EU consumer law and policy stemming from the business' use of artificial intelligence* (Final report of the ARTSY project), EUI Working Papers 11.

Janczuk-Gorywoda A. (2015), *Evolution of EU Retail Payments Law*, 40 European Law Review 858.

Jagtiani J. and Lemieux C. (2019), *The roles of alternative data and machine learning in fintech lending: Evidence from the LendingClub consumer platform*, 48 Financial Management 1009.

Johnson G. and Shriver S. (2020) *Privacy & market concentration: Intended & unintended consequences of the GDPR*, Working Paper, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3477686

Johnson K. N. (2013), *Macroprudential Regulation: A Sustainable Approach to Regulating Financial Markets*, (2013) University of Illinois Law Review 881.

Kathuria V. and Globocnik J. (2019), *Exclusionary Conduct in Data-Driven Markets: Limitations of Data Sharing Remedy*, in M. Botta (ed.), *EU Competition Law Remedies in Data Economy* (Springer)

Kathuria V. and Lai J.C. (2018), *User Review Portability: Why and How?*, TILEC Discussion Paper No. 2018-023, https://ssrn.com/abstract=3203344

Katz V. (2015) *Regulating The Sharing Economy*, 30 Berkeley Tech. L.J. 30 (2015): 1067, 1071-1072.

Kelly J. (2018) *A "fintech sandbox" might sound like a harmless idea. It's not*, Financial Times (December 5), https://ftalphaville.ft.com/2018/12/05/1543986004000/A--fintech-sandbox--might-sound-like-a-harmless-idea--It-s-not/

Kennedy F. John (1962) *Special Message to the Congress on Protecting the Consumer Interest*, https://www.presidency.ucsb.edu/documents/special-message-the-congress-protecting-the-consumer-interest

Kerber W. (2018), *Data Governance in Connected Cars: The Problem of Access to In-Vehicle Data*, 9 JIPITEC 309.

Klus M.F., Lohwasser T. S., Holotiuk F., Moormann J. (2019) *Strategic Alliances between Banks and Fintechs for Digital Innovation: Motiv ation: Motives to Collabor o Collaborate and T ate and Types of Inter ypes of Interaction*, 21 The Journal of Entrepreneurial Finance 1.

Lam W.MW. and Liu X (2020) *Does data portability facilitate entry?*, 69 International Journal of Industrial Organization

Lemma V. (2011), *La riforma degli intermediari finanziari non bancari nella prospettiva di Basilea III*, Rivista elettronica di diritto, economia e management, 184.

Levine R. (2002), *Bank-Based or Market-Based Financial Systems: Which Is Better?*, 4 Journal of Financial Intermediation 11.

Liberti J. M. and Petersen M. A. (2018), *Information: Hard and Soft*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3252869

Lundqvist B. (2018), *Competition and Data Pools*, 4 Journal of European Consumer and Market Law 146;

Lynskey O. (2017), *Aligning data protection rights with competition law remedies? The GDPR right to data portability*, 42 European Law Review 793

Maggiolino, M. (2017), *Personalised Prices in European Competition Law*, Bocconi Legal Studies,

Research Paper No. 2984840.

Manganelli A., Nicita A. (2020), *The Governance of Telecom Markets* (Palgrave Macmillan).

Mak, V. (2013) *The "Average Consumer" of EU Law in Domestic and European Litigation*, in Dorota Leczykiewicz and Stephen Weatherill (eds.), *The Involvement of EU law in Private Law Relationships* (Hart Publishing).

Mariotto C. and Verdier M. (2015), *Innovation and Competition in Internet and Mobile Banking: An Industrial Organization Perspective*, 99 Communications & Strategies 129.

Mavromati D. (2008), *The Law of Payment Services in the EU: The EC Directive on Payment Services in the Internal Market*, (Alphen aan den Rijn: Kluwer Law).

Maudos J. and Vives X. (2019), *Competition Policy in Banking in the European Union*, 55 Review of Industrial Organization 27.

Mattioli M. (2018), *The Data-Pooling Problem*, 32 Berkley Technology Law Journal 179

Mehrotra M. (2016), *The future of investment management: Open application programming interfaces*, Deloitte: Performance Magazine Issue.

Megaw N. and Toplensky R. (2018) *Santander chair calls EU rules on payments unfair*, Financial Times, 17 April https://www.ft.com/content/d9f819f2-3f39-11e8-b7e0-52972418fec4

Megaw N. (2019) *Amazon seeks to revive its faltering loans business*, Financial Times, 13 June https://www.ft.com/content/1eb61d50-81fb-11e9-b592-5fe435b57a3b

Menand L. (2018) *Too Big to Supervise: The Rise of Financial Conglomerates and the Decline of Discretionary Oversight in Banking*, 103 Cornell Law Review 1527.

Menell P.S. (2018) *Rise of the API Copyright Dead: An Updated Epitaph for Copyright Protection of Network and Functional Features of Computer Software*, 31 Harvard Journal of Law & Technology 305

Mexican Parliament (2018), Financial Technology Institutions Law, http://www.diputados.gob.mx/LeyesBiblio/pdf/LRITF_090318.pdf

Micklitz H.W. (2011), *Social Justice and Access Justice in Private Law*, EUI Working Paper LAW No. 2011/02, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1824225

Micklitz H.W. (2012), *European Consumer Law*, The Oxford Handbook of the European Union, in Jones E., Menon A., and Weatherill S. (eds.), *The Oxford Handbook of the European Union* (Oxford University Press).

Milanesi D. (2017), *A New Banking Paradigm: The State of Open Banking in Europe, the United Kingdom and the United States*, TTLF Working Papers n. 29, https://law.stanford.edu/publications/a-new-banking-paradigm-the-state-of-open-banking-in-europe-the-united-kingdom-and-the-united-states/

Milne A., Parboteeah P. (2016), *The Business Models and Economics of Peer-to-Peer Lending*, ECRI Research Report No 17, https://www.ceps.eu/ceps-publications/business-models-and-economics-peer-peer-lending/

Mintel (2019) *Consumers and Data Sharing in Financial Services*, https://reports.mintel.com/display/858755/

Nabilou H., Prüm, A. (2019), *Shadow Banking in Europe: Idiosyncrasies and their Implications for Regulation*, European Journal of Risk Regulation 10, 781–810.

Mik, E. (2016), *The erosion of autonomy in online consumer transactions,* Law, Innovation and Technology, 8(1), 1.

Navaretti G. B., Calzolari G., Pozzolo A. F., *FinTech and banking. Friends or foes?*, 2 European Economy 9.

Omarova S.T. (2020), *Dealing With Disruption: Emerging Approaches to FinTech Regulation*, 61 Washington University Journal of Law & Policy.

Omarova S.T. (2020b), *Technology v Technocracy: Fintech as a Regulatory Challenge*, 6 Journal of Financial Regulation 1, 75-124.

Parker G., Van Alstyne M., and Jiang X. (2016), *Platform Ecosystems: How Developers Invert the Firm*, Boston University Questrom School of Business Research Paper No. 2861574, http://ide.mit.edu/sites/default/files/publications/Platform%20Ecosystems-%20How%20Developers%20Invert%20the%20Frim.pdf

Parker G., Petropoulos G., Van Alstyne M. (2020) *Digital Platforms and Antitrust*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3608397

Paschalidis P. (2012) *Freedom of Establishment and Private International Law for Corporations* (Oxford University Press, Oxford).

Pasquale F. (2015), *The Black Box Society* (Harvard University Press: Cambridge).

Pentheroudakis C. and Baron J.A. (2017), *Licensing terms of standard essential patents – a comparative analysis of cases*, JRC Science for Policy Report, https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/licensing-terms-standard-essential-patents-comprehensive-analysis-cases

Pesneau, A., (2016), Future of French banking monopoly after the enactement of « Loi Macron »: where do we stand and what will come next?, in *Revue trimestrielle de droit financier*, 14.

Petit N. (2020) *Big Tech and The Digital Economy* (Oxford University Press).

Petralia K., Philippon T., Rice T., and Véron N. (2019) *Banking Disrupted? Financial Intermediation in an Era of Transformational Technology*, Geneva Reports on the World Economy 22, International Center for

Pierri N. and Timmer Y (2020), *Tech in Fin before FinTech: Blessing or Curse for Financial Stability?*', CESifo Working Paper No 8067, http://www.cesifo.org/en/publikationen/2020/working-paper/tech-fin-fintech-blessing-or-curse-financial-stability

Plantin J.C., Lagoze C., and Edwards P.N. (2018), *Re-integrating scholarly infrastructure: the ambiguous role of data sharing platforms*, 5 Big Data & Society 1

Poncibò C., Borgogno O. (2021) *Schools of Thought in European Private Law* in Mateja Durovic M., Tridimas T. (eds.) *New Directions in European Private Law*, Series Modern Studies in European Law 103 (Hart).

Poncibò C., Zoboli L. (2020) *Sandboxes and consumer protection: the European perspective*, International Journal on consumer law and practice 8.

Polańsky P.P. (2018), *Some thoughts on data portability in the aftermath of the Cambridge Analytica scandal*, 7 Journal of European Consumer and Market Law 141

Pozsar Z. (2014), *Shadow Banking: The Money View*, Office of Financial Research Working Paper, https://www.financialresearch.gov/working-papers/files/OFRwp2014f4_Pozsar_ShadowBankingTheMoneyView.pdf

Poullet Y. (2018), *Is the general data protection regulation the solution?*, 34 Computer Law & Security Review 773

Prüfer J. and Schottmüller C. (2017), *Competing with Big Data*, TILEC Discussion Paper No. 2017-006, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2918726

Prüm A. (2014), *In the Shadow of the Banks* (Thomson Reuters).

Reich, M. L. (2016), *Machine Learning, Automated Suspicion Algorithms, and the Fourth Amendment*, University of Pennsylvania Law Review, 164, 871.

Richter H. and Slowinski P.R. (2019), *The Data Sharing Economy: On the Emergence of New Intermediaries*, 50 IIC 4

Ringe W. G. and Ruof C. (2020) *Regulating Fintech in the EU: the Case for a Guided Sandbox*, 11 European Journal of Risk Regulation 3, 604-629.

Rohr J., Wright A. (2019) *Blockchain-Based Token Sales, Initial Coin Offerings, and Democratization of Capital Markets*, 70 Hastings Law Journal 463.

Rudegeair P. and Hoffman L. (2019) *Next in the Quest for Consumer Dominance: Banking*, https://www.wsj.com/articles/next-in-googles-quest-for-consumer-dominancebanking-11573644601

Russell N.C., Schaub F., McDonald A., and Sierra-Rocafort W. (2019), *APIs and Your Privacy*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3328825.

Sax, M., Helberger, N., & Bol, N. (2018), *Health as a Means Towards Profitable Ends: mHealth Apps, User Autonomy, and Unfair Commercial Practices*, Journal of Consumer Policy, 41, 103.

Sciarrone A., G. Borello, R. Ferretti, F. Lenoci, E. Macchiavello, F. Mattassoglio, F. Panisi (2019), *Marketplace lending: verso nuove forme di intermediazione finanziaria?*, 5 Quaderni CONSOB, http://www.consob.it/web/area-pubblica/ft5

Seru A. (2019), *Regulating Banks in the era of fintech shadow banks*, Bank of International Settlements, Annual General Meeting (Basel, 30 June 2019), https://www.cb.is/publications/news/news/2019/07/05/Annual-General-Meeting-of-the-Bank-for-International-Settlements-/

Shepherd-Barron J. (2017), *Meet the true star of financial innovation — the humble ATM*, Financial Times, https://www.ft.com/content/052f9310-5738-11e7-80b6-9bfa4c1f83d2.

Schmies et al. (2019) Germany - Lending and Secured Finance Review, 93.

Siciliani P. (2018), *The Disruption of Retail Banking: A Competition Analysis of the Implications for Financial Stability and Monetary Policy*, 4 Journal of Financial Regulation 167.

Stenfors A., Lindo D. (2018) *Libor 1986–2021: the making and unmaking of 'the world's most important price'*, 19 Distinktion: Journal of Social Theory 2, 170-192.

Stulz R.M. (2019), *FinTech, BigTech, and the Future of Banks*, 31(4) Journal of Applied Corporate Finance 86.

Sultan et al. (2019) France – Lending and Secured Finance Review, 78.

Tonner, K. (2014), *From the Kennedy Message to Full Harmonising Consumer Law Directives: A Retrospect* in K. Purnhagen & P. Rott (eds.), *Varieties of European Economic Law and Regulation: Liber amicorum for Hans Micklitz* (Springer).

Treleaven P. (2015) Financial Regulation of Fintech, 3 Journal of Financial Perspectives 3.

TRL (2017), *Access to In-vehicle Data and Resources*, https://ec.europa.eu/transport/sites/transport/files/2017-05-access-to-in-vehicle-data-and-resources.pdf

Tsai C-H., Lin C-F., and Liu H-W. (2020), The Diffusion of the Sandbox Approach to disruptive Innovation and its Limitations', Cornell International Law Journal (forthcoming)

Valcke P., Vandezande N., and van de Velde N. (2015), *The evolution of third payment providers and cryptocurrencies under the EU's upcoming PSD2 and AMLD4*, SWIFT Institute Working Papers No. 1 https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2665973

Varian H. (2018), *Artificial Intelligence, Economics, and Industrial Organization*, NBER Working Paper 24839, http://www.nber.org/papers/w24839

De Vauplane, H. (2013), *Les premieres brèches au monopole bancaire, in Revue Banque*, 765, 21.

Fenwick M.D., Kaal W.A., Vermeulen E.P.M. (2017) *Regulation Tomorrow: What Happens When Technology Is Faster than the Law?*, 6 American University Business Law Review 3.

Vestager M. (2016), *Big Data and Competition* https://ec.europa.eu/commission/commissioners/2014-2019/vestager/announcements/big-data-and-competition_en

Vezzoso S. (2018), *Fintech, Access to Data and the Role of Competition Policy* in Bagnoli V. (Ed.), Competition and Innovation (São Paulo: Scortecci).

Vives X. (2019a), *Competition and stability in modern banking: A post-crisis perspective*, 64 International Journal of Industrial Organization 55

Vives X. (2019b), *Digital disruption in financial markets*, 11 Annual Review of Financial Economics 243

Vives X. (2017), *The Impact of Fintech on Banking*, 2 European Economy 97., *Competition and Stability in Banking: The Role of Regulation and Competition Policy*, 76-83 (Princeton: Princeton University Press, 2016).

Von Solms J. (2020) Integrating Regulatory Technology (RegTech) into the digital transformation of a bank Treasury, Journal of Banking Regulation.

Weatherill, S. (2001) *Justifying Limits to Party Autonomy in the Internal Market – EC Legislation in the Field of Consumer Protection*, in S. Grundmann, W. Kerber & S. Weatherill (eds.), *Party Autonomy and the Role of Information in the Internal Market* (de Gruyter).

Wilmarth A.E. (2004), *The OCC's Preemption Rules Exceed the Agency's Authority and Present A Serious Threat to the Dual Banking System and Consumer Protection*, 23 Review of Banking and Financial Law 225.

https://openscholarship.

Weber R.H. (2017) *RegTech as a New Legal Challenge*, Journal of Financial Transformation 46,10–17.

Weber, R.H., Baisch R. (2018) *FinTech—Eligible Safeguards to Foster the Regulatory Framework*, 10 Journal of Financial Regulation and Compliance 33, 335–350

Wetzer T., *In Two Minds: The Governance of Ring-Fenced Banks*, 19 Journal of Corporate Law Studies 1, 197-249.

Whish R. and Bailey D. (2018), Competition Law, 9th Edition, (Oxford University Press).

Wiedemann K. (2018), *Automated Processing of Personal Data for the Evaluation of Personality Traits: Legal and Ethical Issues*, Max Planck Institute for Innovation & Competition Research Paper No. 18-04.

Witkowski R. (2019), *Fintechs May Finally Win Charter Chase in 2019*, https://www.americanbanker.com/news/fintechs-may-finally-win-charter-chase-in-2019

Wolfert S., Ge L., Verdouwa C., and Bogaardt M.J. (2017), *Big Data in Smart Farming – A review*, 153 Agricultural Systems 69

Zachariadis M. and Ozcan P. (2017), *The API Economy and Digital Transformation in Financial Services: The Case of Open Banking*, SWIFT Institute Working Paper No. 2016-001, https://swiftinstitute.org/wp-content/uploads/2017/07/SIWP-2016-001-Impact-Open-APIs-FINAL.pdf

Zaring D. (2020) *Modernizing the Bank Charter*, 61 William & Mary Law review 1397, https://scholarship.law.wm.edu/wmlr/vol61/iss5/5

Zepeda R. (2017) *The 2018 Big Bang*, Working Paper, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3029145

Zernik A. (2020), *The (Unfulfilled) Fintech Potential*, 1 Notre Dame Journal on Emerging Technology (forthcoming)

Zetzsche D. A., Buckley R. P., Arner D. W., Barberis J. N. (2018), *From FinTech to TechFin: The Regulatory Challenges of Data-Driven Finance*, 14 NYU Journal of Law & Business 393.

Zetzsche D. A., Buckley R. P., Arner D. W., Barberis J. N. (2019), *The Future of Data-Driven Finance and RegTech: Lessons from EU Big Bang II*, EBI Working Paper Series No. 35 (2019), https://ssrn.com/abstract=3359399

Zunzunegui F. (2018), *Digitalisation of payment services*, Ibero-American Institute for Law and Finance Working Paper Series No. 5, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3256281

B. POLICY AND REGULATORY MATERIALS

ACPR (2017) Les priorités de contrôle pour le secteur bancaire en 2017, https://acpr.banque-france.fr/sites/default/files/medias/documents/actualites31-3.pdf

Accenture (2016), *Seizing the Opportunities Unlocked by the EU's Revised Payment Services Directive PSD2: A Catalyst for New Growth Strategies in Payments and Digital Banking*, (2016) https://www.accenture.com/t20170707T153413Z__w__/ca-fr/_acnmedia/PDF-15/PSD2-Seizing-Opportunities-EU-Payment-Services-Directive-(1)-(1).pdf

Accenture (2017) *Research on Open Banking and UK consumers*, https://newsroom.accenture.com/news/accenture-research-finds-lack-of-trust-in-third-party-providers-creates-major-opportunity-for-banks-as-open-banking-set-to-roll-out-across-europe.htm

Advisory Committee to the Open Banking Review (2019), *A Review into the Merits of Open Banking*, https://www.canada.ca/en/department-finance/programs/consultations/2019/open-banking.html

Article 29 Data Protection Working Party (2017), *Guidelines on the right to 'data portability'*, https://ec.europa.eu/newsroom/article29/item-detail.cfm?item_id=611233

Article 29 Data Protection Working Party (2013), *Opinion 03/2013 on purpose limitation*, https://ec.europa.eu/justice/article-29/documentation/opinion-recommendation/files/2013/wp203_en.pdf

Australian Competition and Consumer Commission (2020), *Competition and Consumer* (Consumer Data Right) Rules 2020, https://www.accc.gov.au/media-release/consumer-data-right-rules-made-by-accc

Australian Competition and Consumer Commission (2019) *Digital platforms inquiry*, https://www.accc.gov.au/focus-areas/inquiries-ongoing/digital-platforms-inquiry

Australian Competition and Consumer Commission (2020) *Consumer Data Right Rules 2020*, https://www.accc.gov.au/media-release/consumer-data-right-rules-made-by-accc

Australian Government (2018a), *Consumer Data Right*, https://treasury.gov.au/consumer-data-right

Australian Government (2018b), *New Australian Government Data Sharing and Release Legislation*, https://www.pmc.gov.au/resource-centre/public-data/issues-paper-data-sharing-release-legislation

Australian Government (2017), *Review into Open Banking: giving customers choice, convenience and confidence*, https://static.treasury.gov.au/uploads/sites/1/2018/02/Review-into-Open-Banking-For-web-1.pdf

Australian Government Productivity Commission (2018), *Competition in the Australian Financial System*, Report No. 89, https://www.pc.gov.au/inquiries/completed/financial-system/report

Autorité de contrôle prudential et de resolution (2018) *Annual Report*, 13, https://acpr.banque-france.fr/sites/default/files/medias/documents/2018_rapport_acpr_en_interactif.pdf

Banca d'Italia (2015), *Disposizioni di vigilanza per gli intermediari finanziari*, Circ. n. 288/2015, https://www.bancaditalia.it/compiti/vigilanza/normativa/archivio-norme/circolari/c288/index.html?com.dotmarketing.htmlpage.language=102

Banca d'Italia (2014), *Disposizioni di vigilanza per gli intermediari finanziari*, https://www.bancaditalia.it/compiti/vigilanza/normativa/consultazioni/2014/disp-vig-2/index.html

Banco Central do Brasil (2020) *New payment solution requires prior authorization from the BCB*, Press release https://www.bcb.gov.br/en/pressdetail/2339/nota

Bank of England (2019) *Embracing the promise of fintech*, Quarterly Bulletin Q1, https://www.bankofengland.co.uk/quarterly-bulletin/2019/2019-q1/embracing-the-promise-of-fintech

Bank of England (2019a) *Response to the Department for Business, Energy & Industrial Strategy Consultation paper on Smart Data*, https://www.bankofengland.co.uk/-/media/boe/files/research/the-boes-response-to-the-beis-on-the-smart-data-consultation.pdf

Bank for International Settlements (2019a), *Big tech in finance: opportunities and risks*, https://www.bis.org/publ/arpdf/ar2019e3.htm

Bank of International Settlements (2019b), Annual Report, https://www.bis.org/about/areport/areport2019.pdf

Belgian Competition Authority, Dutch Authority for Consumers & Markets, and Luxembourg Conseil de la Concurrence (2019*) Joint memorandum on challenges faced by competition authorities*

in a digital world, https://www.belgiancompetition.be/en/about-us/publications/joint-memorandum-belgian-dutch-and-luxembourg-competition-authorities

Bruegel (2017), Capital Markets Union and the fintech opportunity, Policy Contribution Issue n 22, https://www.bruegel.org/wp-content/uploads/2017/09/PC-22-2017.pdf

Bureau of Consumer Financial Protection (2018) *Policy on No-Action Letters and the BCFP Product Sandbox*, https://www.govinfo.gov/content/pkg/FR-2018-12-13/pdf/2018-26873.pdf

Canadian Competition Bureau (2017), *Technology-led innovation and emerging services in the Canadian financial services sector*, http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04315.html

CB Insights (2019), *Global Fintech Report Q2 2019*, https://fintek.pl/wp-content/uploads/2019/08/CB-Insights_Fintech-Report-Q2-2019.pdf

Ernst & Young (2019), *Global FinTech Adoption Index 2019*, https://www.ey.com/en_it/ey-global-fintech-adoption-index

Ernst & Young (2017), *FinTech Adoption Index*, https://www.ey.com/en_gl/banking-capital-markets/four-themes-driving-fintech-adoption-by-consumers

Euro Banking Association (2017) *Open Banking: Advancing Customer-Centricity. Analysis and Overview*, https://www.abe-eba.eu/media/azure/production/1355/eba_open_banking_advancing_customer-centricity_march_2017.pdf

Euro Banking Association (2016), *Understanding the Business Relevance of Open APIs and Open Banking for Banks*, https://www.abe-eba.eu/media/azure/production/1522/business-relevance-of-open-apis-and-open-banking-for-banks.pdf

Euro Banking Association (2017), *Open Banking: Advancing Customer-Centricity. Analysis and Overview*, <https://www.abe-eba.eu/media/azure/production/1355/eba_open_banking_advancing_customer-centricity_march_2017.pdf> accessed 5 March 2020

European Banking Authority (2020) EBA RegTech Industry Survey, https://eba.europa.eu/eba-consults-use-regtech-solutions-and-ways-support-uptake-regtech-across-eu

European Banking Authority (2019a) *Clarifications to issues I to III raised by participants of the EBA Working Group on APIs under PSD2*, https://eba.europa.eu/-/eba-publishes-clarifications-to-the-first-set-of-issues-raised-by-its-working-group-on-apis-under-psd2

European Banking Authority (2019b), *Clarifications to issues IV to VII raised by participants of the EBA Working Group on APIs under PSD2*, https://eba.europa.eu/-/eba-publishes-clarifications-to-the-second-set-of-issues-raised-by-its-working-group-on-apis-under-psd2

European Banking Authority (2019c), *Guidelines on ICT and security risk management*, https://eba.europa.eu/sites/default/documents/files/documents/10180/2522896/32a28233-12f5-49c8-9bb5-

f8744ccb4e92/Final%20Guidelines%20on%20ICT%20and%20security%20risk%20management.pdf

European Banking Authority (2019d), *Report on Regulatory perimeter, regulatory status and authorisation approaches in relation to FinTech activities*, https://eba.europa.eu/eba-publishes-report-on-regulatory-perimeter-regulatory-status-and-authorisation-approaches-in-relation-to-fintech-activities

European Banking Authority (2019e), *Report with advice for the European Commission on crypto-assets*, https://eba.europa.eu/sites/default/documents/files/documents/10180/2545547/67493daa-85a8-4429-aa91-e9a5ed880684/EBA%20Report%20on%20crypto%20assets.pdf?retry=1

European Banking Authority (2019f), *Fintech: Regulatory sandboxes and innovation hubs*, https://www.esma.europa.eu/sites/default/files/library/jc_2018_74_joint_report_on_regulatory_sandboxes_and_innovation_hubs.pdf

European Banking Authority (2018a), *The EBA's Fintech Roadmap – conclusions from the consultation on the EBA's approach to financial technology (Fintech)*, https://eba.europa.eu/documents/10180/1919160/EBA+Fintech+Roadmap.pdf

European Banking Authority (2018b), *Report on the impact of Fintech on incumbent credit institutions' business models,* https://eba.europa.eu/eba-assesses-risks-and-opportunities-from-fintech-and-its-impact-on-incumbents-business-models

European Banking Authority (2018c), *Opinion on the implementation of the RTS on SCA and CSC*, (2018) http://www.eba.europa.eu/-/eba-publishes-opinion-on-the-implementation-of-the-rts-on-strong-customer-authentication-and-common-and-secure-communication

European Banking Authority (2018d) Report on the Impact of Fintech on Institutions' Business Model, https://eba.europa.eu/sites/default/documents/files/documents/10180/2270909/1f27bb57-387e-4978-82f6-ece725b51941/Report%20on%20the%20impact%20of%20Fintech%20on%20incumbent%20credit%20institutions%27%20business%20models.pdf

European Banking Authority (2017a), *EBA Opinion on virtual currencies*, https://eba.europa.eu/sites/default/documents/files/documents/10180/657547/81409b94-4222-45d7-ba3b-7deb5863ab57/EBA-Op-2014-08%20Opinion%20on%20Virtual%20Currencies.pdf?retry=1

European Banking Authority (2017b), *Report on other financial intermediaries and regulatory perimeter issues*, https://eba.europa.eu/sites/default/documents/files/documents/10180/1720738/dd684aa4-e2fb-4856-8f3f-34293a8b5591/Report%20on%20OFIs.pdf

European Banking Authority (2017c), *Final Report on the EBA Guidelines under Directive (EU) 2015/2366 (PSD2) on the information to be provided for the authorisation of payment institutions and e-money institutions and for the registration of account information service providers*, https://eba.europa.eu/sites/default/documents/files/documents/10180/1904583/f0e94433-f59b-4c24-9cec-

2d6a2277b62c/Final%20Guidelines%20on%20Authorisations%20of%20Payment%20Institutions%20(EBA-GL-2017-09).pdf

European Banking Authority (2017d), *Guidelines on authorisation and registration under PSD2*, https://eba.europa.eu/eba-publishes-final-guidelines-on-authorisation-and-registration-under-psd2

European Banking Authority (2017e), *Report on Other Financial Intermediaries and regulatory perimeter*

Issues, https://eba.europa.eu/sites/default/documents/files/documents/10180/1720738/dd684aa4-e2fb-4856-8f3f-34293a8b5591/Report%20on%20OFIs.pdf

European Banking Authority (2017f), *Opinion of the European Banking Authority on matters relating to other financial intermediaries and regulatory perimeter issues*, https://eba.europa.eu/sites/default/documents/files/documents/10180/2019769/b20f96ae-9339-4dea-8014-ae19de1c7f73/Opinion%20on%20OFIs%20%28EBA-Op-2017-13%29.pdf

European Banking Authority (2017g), *Discussion Paper on the EBA's approach to financial technology (FinTech)*, https://www.eba.europa.eu/documents/10180/1919160/EBA+Discussion+Paper+on+Fintech+%28EBA-DP-2017-02%29.pdf

European Banking Authority (2017h), *Final Report on Draft Regulatory Technical Standards on Strong Customer Authentication and common and secure communication under Article 98 of Directive 2015/2366 (PSD2)*, https://www.eba.europa.eu/documents/10180/1761863/Final+draft+RTS+on+SCA+and+CSC+under+PSD2+(EBA-RTS-2017-02).pdf

European Banking Authority (2017i), *Opinion on the European Commission's intention to partially endorse and amend the EBA's final draft regulatory technical standards on strong customer authentication and common and secure communication under PSD2*, https://eba.europa.eu/documents/10180/1894900/EBA+Opinion+on+the+amended+text+of+the+RTS+on+SCA+and+CSC+%28EBA-Op-2017-09%29.pdf

European Banking Authority (2017j), *Recommendations on outsourcing to cloud service providers*, https://eba.europa.eu/sites/default/documents/files/documents/10180/2170121/5fa5cdde-3219-4e95-946d-0c0d05494362/Final%20draft%20Recommendations%20on%20Cloud%20Outsourcing%20(EBA-Rec-2017-03).pdf

European Banking Authority (2016), *Innovative uses of consumer data by financial institutions*, http://www.eba.europa.eu/documents/10180/1455508/EBA-DP-2016-01+DP+on+innovative+uses+of+consumer+data+by+financial+institutions.pdf (accessed 5 Aug. 2019)

European Banking Authority (2014a), *EBA Opinion on virtual currencies*, https://eba.europa.eu/sites/default/documents/files/documents/10180/657547/81409b94-4222-45d7-ba3b-7deb5863ab57/EBA-Op-2014-08%20Opinion%20on%20Virtual%20Currencies.pdf?retry=1

European Banking Authority (2014b), *Report to the European Commission on the perimeter of credit institutions established in the Member States*, https://eba.europa.eu/sites/default/documents/files/documents/10180/534414/6bbabcef-ac51-48b8-a4fb-45dfd483e486/2014%2011%2027%20-%20EBA%20Report%20-%20Credit%20institutions.pdf?retry=1

European Central Bank (2019), *Guide to assessments of licence applications: Licence applications in general - 2nd revised edition*, https://www.google.com/search?client=firefox-b-e&q=ECB%2C+Guide+to+assessments+of+licence+applications%3A+Licence+applications+in+general

European Central Bank (2010), *The payment system*, (2010) https://www.ecb.europa.eu/pub/pdf/other/paymentsystem201009en.pdf

European Central Bank (2018) *SSM Supervisory Manual European banking supervision:*

functioning of the SSM and supervisory approach, https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.supervisorymanual201803.en.pdf

European Commission (2020) *Communication 'A European strategy for data'*, COM(2020) 66 final.

European Commission (2020a), *Communication 'Shaping Europe's digital future'*, COM(2020) 67 final, 2.

European Commission (2020b) *Proposal for a Regulation of the European Parliament and of the Council on contestable and fair markets in the digital sector (Digital Markets Act)*, COM(2020) 842 final.

European Commission (2020c) *Digital Services Act package: Ex ante regulatory instrument for large online platforms with significant network effects acting as gatekeepers in the European Union's internal market*, Inception impact assessment, https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12418-Digital-Services-Act-package-ex-ante-regulatory-instrument-of-very-large-online-platforms-acting-as-gatekeepers

European Commission (2020d) *New Competition Tool*, Inception impact assessment https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12416-New-competition-tool

European Commission (2020e) *Commission opens investigation into Apple practices regarding Apple Pay*, Press release IP/20/1075, https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1075

European Commission (2018a), *Towards a common European data space* (Communication) COM (2018) 232 final

European Commission (2018b), *Guidance on sharing private sector data in the European data economy* (Staff Working Document) SWD (2018) 125 final

European Commission (2018c), *Coordinated Plan on Artificial Intelligence*, (Communication) COM (2018) 795 final

European Commission (2018d), *Artificial Intelligence for Europe*, (Communication) COM (2018) 237 final

European Commission (2018e), *FinTech Action plan: For a more competitive and innovative European financial sector* (Communication) COM (2018) 109 final

European Commission (2018g), *Stronger protection, new opportunities - Commission guidance on the direct application of the General Data Protection Regulation as of 25 May 2018*, (Communication) COM (2018) 43 final

European Commission (2018h), *Communication on enabling the digital transformation of health and care in the Digital Single Market: Empowering citizens and building a healthier society*, (Communication) COM (2018) 233 final

European Commission (2018i), *On the road to automated mobility: An EU strategy for mobility of the future*, (Communication) COM/2018/283 final

European Commission (2018l), *Proposal for a regulation of the European parliament and of the Council on European crowdfunding service providers (ECSP) for business*, COM (2018) 113 final

European Commission (2018l), *Proposal for Regulation of European crowdfunding service providers*, COM(2018)0113, https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-5288649_en

European Commission (2017a), *Building a European Data Economy* (Communication) COM (2017) 9 final

European Commission (2017b), *The free flow of data and emerging issues of the European data economy*' (Staff Working Document) SWD (2017) 2 final, accompanying *Building a European data economy*

European Commission (2017c), *Public Consultation on FinTech: A more competitive and innovative European financial sector*, https://ec.europa.eu/info/sites/info/files/2017-fintech-summary-of-responses_en.pdf

European Commission (2017d), *Setting out the EU approach to Standard Essential Patents*, (Communication) COM(2017) 712 final

European Commission (2017e), *Communication on the intention to endorse, with amendments, the draft Regulatory Technical Standards submitted by the European Banking Authority for strong customer authentication and common and secure open standards of communication in accordance with Article 98(4) of Directive (EU) 2015/2366*, (Communication) COM (2017) 3459 final

European Commission (2017f), *Identifying market and regulatory obstacles to cross-border development of crowdfunding in the EU*, https://ec.europa.eu/info/sites/info/files/171216-crowdfunding-report_en.pdf

European Commission (2017g), *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Mid-Term Review of the Capital Markets Union Action Plan*, COM(2017) 292 final.

European Commission (2017h), *Summary of contributions to the 'Public Consultation on FinTech: a more competitive and innovative European financial sector*, 9 https://ec.europa.eu/info/sites/info/files/2017-fintech-summary-of-responses_en.pdf.

European Commission (2017i), *Fact Sheet*, MEMO/17/3761 http://europa.eu/rapid/press-release_MEMO-17-3761_en.htm

European Commission (2017g), Consumer Financial Services Action Plan: Better Products, More Choice, https://ec.europa.eu/info/publications/consumer-financial-services-action-plan_en

European Commission (2017l) *Consumer financial services action plan*, https://ec.europa.eu/info/publications/consumer-financial-services-action-plan_en

European Commission (2017m) First private sector eID scheme pre-notified by Italy under eIDAS, https://ec.europa.eu/digital-single-market/en/news/first-private-sector-eid-scheme-pre-notified-italy-under-eidas

European Commission (2016a), *Crowdfunding in the EU Capital Markets Union*, Staff Working Document SWD(2016) 154 final

European Commission (2016b), 12 *Online Platforms* (Staff Working Document) SWD (2016) 172 final, accompanying *Online Platforms and the Digital Single Market* (Communication) COM (2016) 288 final

European Commission (2015a), *A Digital Single Market Strategy for Europe* (Communication) COM (2015) 192 final

European Commission (2015b), *Economic Analysis Accompanying the Document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Action Plan on Building a Capital Markets Union*, Commission Staff Working Document, https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52015SC0183

European Commission (2015c), *Communication from the Commission to the european parliament, the council, the european economic and social committee and the committee of the regions action plan on building a capital markets union*, COM/2015/0468 final.

European Commission (2014a), *Towards a thriving data-driven economy* (Communication) COM (2014) 442 final

European Commission (2014b), *Guidelines on the application of Article 101 of the Treaty on the Functioning of the European Union to technology transfer agreements* (Communication) (2014) OJ C 89/3

European Commission (2014c), *Unleashing the potential of Crowdfunding in the European Union*, COM (2014) 172 final

European Commission (2014d), *European Financial Stability and Integration*, https://ec.europa.eu/info/sites/info/files/efsir-2013-28042014_en.pdf

European Commission (2013a), *Proposal for a Regulation of the European Parliament and of the Council on Money Market Funds*, COM(2013) 615 final.

European Commission (2013b), Communication from the Commission to the Council and the European parliament Shadow Banking – Addressing New Sources of Risk in the Financial Sector, https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2013:0614:FIN:EN:PDF

European Commission (2013c), *Impact Assessment accompanying the Proposal for a directive on payment service in the internal market*, Staff working document, SWD(2013) 288 final.

European Commission (2011), *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements* (Communication) OJ C 11/1

European Commission (2011b), *Towards an integrated European market for card, internet and mobile payments*, COM(2011) 941 final, 11.

European Commission (2003), *A New Legal Framework for Payments in the Internal Market*, COM(2003) 718 final, 8.

European Council (2013) *Conclusions*, EUCO 169/13, http://data.consilium.europa.eu/doc/document/ST-169-2013-INIT/en/pdf

European Data Protection Board (2020), *Guidelines 06/2020 on the interplay of the Second Payment Services Directive and the GDPR*, Version 1.0 Adopted on 17 July 2020, https://edpb.europa.eu/sites/edpb/files/consultation/edpb_guidelines_202006_interplaypsd2andgdpr.pdf

European Data Protection Board (2019), *Guidelines 2/2019 on the processing of personal data under Article 6(1)(b) GDPR in the context of the provision of online services to data subjects - version adopted after public consultation*, https://edpb.europa.eu/our-work-tools/our-documents/leitlinien/guidelines-22019-processing-personal-data-under-article-61b_en

European Data Protection Board (2018) *Letter on consent definition under GDPR and PSD2*, https://edpb.europa.eu/sites/edpb/files/files/file1/psd2_letter_en.pdf

European Forum for Innovation Facilitators (2019) *Terms of Reference*, https://esas-joint-committee.europa.eu/Publications/efif/EFIF%20Terms%20of%20Reference.pdf

European Parliament (2017), *FinTech: the influence of technology on the future of the financial sector*, http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+REPORT+A8-2017-0176+0+DOC+PDF+V0//EN

European Parliament (2012), *Report on shadow banking*, http://www.europarl.europa.eu/sides/getDoc.do?type=REPORT&reference=A7-2012-0354&language=EN

European Parliamentary Research Service (2015) *Consumer protection in the EU*, DOI http://10.2861/575862

European Securities and Markets Authority (ESMA) (2019), Annual Statistical Report on EU Alternative Investment Funds, https://www.esma.europa.eu/sites/default/files/library/esma50-165-748_aif_report_2019.pdf

European Systemic Risk Board (2020), *EU Non-bank Financial Intermediation Risk Monitor*, https://www.esrb.europa.eu/pub/pdf/reports/nbfi_monitor/esrb.202010_eunon-bankfinancialintermediationriskmonitor2020~89c25e1973.en.pdf?588be9e8391cfb17584d2a283dfe0abe

European Systemic Risk Board (2019), *EU Non-bank Financial Intermediation Risk Monitor*, https://www.esrb.europa.eu/pub/pdf/reports/esrb.report190717_NBFImonitor2019~ba7c155135.en.pdf

European Supervisory Authorities (2018a), *Joint Committee Final Report on Big Data,* https://esas-joint-committee.europa.eu/Publications/Reports/Final%20Report%20on%20Big%20Data.pdf

European Supervisory Authorities (2018b), Warning on Virtual Currencies, https://eba.europa.eu/esas-warn-consumers-of-risks-in-buying-virtual-currencies

European Supervisory Authorities (2017), Joint Committee Annual Report 2017, https://esas-joint-committee.europa.eu/Publications/Reports/JC%202018%2010%20(Joint%20Committee%20Annual%20Report%202017).pdf

European Supervisory Authorities (2016), *Joint Committee Discussion Paper on The Use of Big Data by Financial Institutions*, https://www.esma.europa.eu/sites/default/files/library/jc-2016-86_discussion_paper_big_data.pdf

European Parliament (2017) FinTech: the influence of technology on the future of the financial sector, http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+REPORT+A8-2017-0176+0+DOC+PDF+V0//EN

Deloitte (2017), *Study on emerging issues of data ownership, interoperability, (re-)usability and access to data, and liability*, https://ec.europa.eu/digital-single-market/en/news/study-emerging-issues-data-ownership-interoperability-re-usability-and-access-data-and

Deloitte (2017a), *Study to support the review of Directive 2003/98/EC on the re-use of public sector information*, https://ec.europa.eu/digital-single-market/en/news/impact-assessment-support-study-revision-public-sector-information-directive

Deloitte (2018), *Overview of the Fintech sector: challenges for the European players and possible policy measures at EU level*, Study prepared for the European Commission, 129, https://publications.europa.eu/en/publication-detail/-/publication/d6b1ebc0-2379-11e9-8d04-01aa75ed71a1/language-en/format-PDF

Digital Competition Expert Panel (2019) *Unlocking digital competition*, https://www.gov.uk/government/publications/unlocking-digital-competition-report-of-the-digital-competition-expert-panel

Expert Group on Regulatory Obstacles to Financial Innovation (2019), *Thirty Recommendations on Regulation, Innovation and Finance*,

https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/191113-report-expert-group-regulatory-obstacles-financial-innovation_en.pdf

Facebook, Google, Microsoft, and Twitter (2018), *Data transfer Project*, White Paper, https://datatransferproject.dev/

Federal Trade Commission (2014), *Data Brokers: A Call for Transparency and Accountability*

Federal Financial Supervisory Authority (2019) *Annual Report*, https://www.bafin.de/SharedDocs/Downloads/EN/Jahresbericht/dl_jb_2019_iXBRL_en.html?view=renderXbr

Financial Conduct Authority (2019a), *Business Plan 2019/20*, https://www.fca.org.uk/publication/business-plans/business-plan-2019-20.pdf

Financial Conduct Authority (2019b), *Call for Input: Open finance*, https://www.fca.org.uk/publication/call-for-input/call-for-input-open-finance.pdf

Financial Conduct Authority (2018), *Strategic Review of Retail Banking Business Models*, 8, https://www.fca.org.uk/publications/multi-firm-reviews/strategic-review-retail-banking-business-models

Financial Conduct Authority (2017), *Regulatory sandbox lessons learned report*, https://www.fca.org.uk/publication/research-and-data/regulatory-sandbox-lessons-learned-report.pdf

Financial Conduct Authority (2016), *Market-Based Finance: Its Contributions and Emerging Issues*, Occasional Paper 18 https://www.fca.org.uk/publications/occasional-papers/occasional-paper-no-18-market-based-finance-its-contributions-and

Financial Conduct Authority (2016b), *Price discrimination and cross-subsidy in financial services*, Occasional Paper No. 22, https://www.fca.org.uk/publication/occasional-papers/op16-22.pdf

Financial Conduct Authority (2015), *Regulatory sandbox*, https://www.fca.org.uk/publication/research/regulatory-sandbox.pdf

Financial Conduct Authority (2014), *A new regulatory framework for payment systems in the UK*, Consultation Paper, https://www.fca.org.uk/publication/other/psr-cp14-1-cp-a-new-regulatory-framework-for-payment-systems-in-the-uk.pdf

Financial Conduct Authority (2014a) *Project Innovate: Call for input*, https://www.fca.org.uk/publication/feedback/fs-14-2.pdf

Financial Conduct Authority (2013), *The FCA's response to the Parliamentary Commission on Banking Standards*, https://www.fca.org.uk/publication/corporate/pcbs-response.pdf

Financial Market Supervisory Authority of Switzerland (FINMA) (2018), *Guidelines for FinTech licence applications pursuant to Article 1b of the Banking Act*, https://www.finma.ch/en/~/media/finma/dokumente/dokumentencenter/myfinma/1bewilligung/fintech/w_bewillligungfintech_20181203_de.pdf?la=en>

Financial Stability Board (2020), *Global Monitoring Report on Non-Bank Financial Intermediation* https://www.fsb.org/wp-content/uploads/P190120.pdf

Financial Stability Board (2019a), *BigTech in finance: Market developments and potential financial stability implications*, https://www.fsb.org/2019/12/bigtech-in-finance-market-developments-and-potential-financial-stability-implications/

Financial Stability Board (2019b), *FinTech and market structure in financial services: Market developments and potential financial stability implications*, https://www.fsb.org/2019/02/fintech-and-market-structure-in-financial-services-market-developments-and-potential-financial-stability-implications/

Financial Stability Board (2017), *Financial Stability Implications from FinTech*, https://www.fsb.org/2017/06/financial-stability-implications-from-fintech/

Financial Stability Board (2015), *Global Shadow Banking Monitoring Report*, https://www.fsb.org/wp-content/uploads/global-shadow-banking-monitoring-report-2015.pdf

Financial Stability Board (2011), *Progress in the Implementation of the G20 Recommendations for Strengthening Financial Stability: Report of the Financial Stability Board to G20 Finance Ministers and Central Bank Governors*, https://www.fsb.org/wp-content/uploads/r_110415a.pdf?page_moved=1

Fingleton J. (2018), *From Open Banking to Open Everything*, https://medium.com/fingleton/from-open-banking-to-open-everything-3072079b7c58

French Competition Authority (2020) *Contribution to the debate on competition policy and digital challenges*, https://www.autoritedelaconcurrence.fr/sites/default/files/2020-03/2020.03.02_contribution_adlc_enjeux_numeriques_vf_en_0.pdf

Government of Canada (2019), *Consumer-directed finance: the future of financial services*, https://www.canada.ca/en/department-finance/programs/consultations/2019/open-banking/report.html

IDC and Open Evidence (2017), *European Data Market Study*, https://ec.europa.eu/digital-single-market/en/news/final-results-european-data-market-study-measuring-size-and-trends-eu-data-economy

Independent Commission on Banking (2011), *Final Report Recommendations*, https://webarchive.nationalarchives.gov.uk/20120827143059/http://bankingcommission.independent.gov.uk/

Japanese Parliament (2016) *Banking Act*, https://www.fsa.go.jp/en/news/2008/20080627-4/01.pdf

Joint Research Center (2018), *Artificial Intelligence - A European Perspective*, https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/artificial-intelligence-european-perspective

Office of the Comptroller of the Currency (2019) Innovation Pilot Program, https://www.occ.gov/topics/supervision-and-examination/responsible-innovation/occ-innovation-

pilot-program.pdf

Office of the Comptroller of the Currency (2020), *Semiannual Risk Perspective*, https://www.occ.treas.gov/publications-and-resources/publications/semiannual-risk-perspective/files/semiannual-risk-perspective-spring-2020.html

Office of the Comptroller of the Currency (2019) *OCC Innovation Pilot Program*, https://www.occ.treas.gov/topics/supervision-and-examination/responsible-innovation/index-responsible-innovation.html

Office of the Comptroller of the Currency (2018), *Policy statement on financial technology companies' eligibility to apply for national bank charters*, https://www.occ.gov/news-issuances/news-releases/2018/pub-other-occ-policy-statement-fintech.pdf

OECD (2019), *Enhancing Access to and Sharing of Data: Reconciling Risks and Benefits for Data Re-use across Societies*, OECD Publishing, Paris

OECD (2018) *Consumer-facing remedies*, http://www.oecd.org/daf/competition/consumer-facing-remedies.htm

Open Data Institute and Fingleton (2019), Open Banking, Preparing for lift off, https://www.openbanking.org.uk/wp-content/uploads/open-banking-report-150719.pdf

Parliamentary Commission on Banking Standards (2013) *Changing banking for good*, https://www.parliament.uk/documents/banking-commission/Banking-final-report-vol-ii.pdf

Monetary and Banking Studies and Centre for Economic Policy Research, https://cepr.org/content/geneva-report-22-banking-disrupted-financial-intermediation-era-transformational-technology

Polish Bank Association (2019) *PolishAPI. Specification of an interface for the needs of services provided by third parties on the basis of access to payment accounts*, https://docs.polishapi.org/files/ver2.1.2/PolishAPI-spec-v2.1.2-EN.pdf

Portuguese Competition Authority (2018), *Technological Innovation and Competition in the Financial Sector in Portugal Issues Paper*, http://www.concorrencia.pt/vEN/Estudos_e_Publicacoes/Estudos_Economicos/Banca_e_Seguros/Documents/2018%20-%20Issues%20Paper%20Technological%20Innovation%20and%20Competition%20in%20the%20Financial%20Sector%20in%20Portugal.pdf

PWC (2020) *The Swiss fintech licence - A brief introduction*, https://www.pwc.ch/en/publications/2020/The%20swiss%20fintech%20license_EN_web.pdf

PWC (2017), *Cross-Cutting Business Models for IoT*, https://ec.europa.eu/digital-single-market/en/news/cross-cutting-business-models-internet-things-iot

Slovak Banking Association (2017), *Slovak Banking API Standard*, https://www.sbaonline.sk/Content/files/projects/slovak-banking-api-standard-1_0.pdf

Spanish Competition Authority (2018), *Market Study on the Impact on Competition of Technological Innovation in the Financial Sector (Fintech)*,

https://www.cnmc.es/sites/default/files/editor_contenidos/Notas%20de%20prensa/2018/181009%20Market%20Study%20on%20the%20impact%20on%20competition%20of%20technological%20innovation%20in%20the%20financial%20sector.pdf

Slovak Banking Association (2017) *Slovak Banking API Standard*, https://www.sbaonline.sk/Content/files/projects/slovak-banking-api-standard-1_0.pdf

STET (2019), *PSD2 API Documentation Part 1: Framework*, https://www.stet.eu/assets/files/PSD2/1-4-1/api-dsp2-stet-v1.4.1.3-part-1-framework.pdf

Stigler Committee for the Study of Digital Platforms (2019) *Market Structure and Antitrust Subcommittee Report*, https://research.chicagobooth.edu/stigler/events/single-events/antitrust-competition-conference/digital-platforms-committee

Swiss Competition Commission (2018), *COMCO launches investigation into several Swiss financial institutions*, https://www.weko.admin.ch/weko/en/home/latest-news/press-releases/nsb-news.msg-id-72928.html

Swiss Financial Market Supervisory Authority (2019) *Guidelines for FinTech licence applications pursuant to Article 1b of the Banking Act*, https://www.finma.ch/en/~/media/finma/dokumente/dokumentencenter/myfinma/1bewilligung/fintech/w_bewillligungfintech_20181203_de.pdf?la=en

Swiss Financial Market Supervisory Authority (2018*) FinTech licence: FINMA sets out details of antimoney laundering due diligence requirements*, https://www.finma.ch/en/news/2018/12/20181210-mm-fintech-bewilligung/.

The Netherlands Authority for Consumers & Markets (2019) *Protection of the online consumer. Boundaries of online persuasion, Draft consultation document Guidelines*, https://www.acm.nl/sites/default/files/documents/2019-12/draft-consultation-acm-guidelines-on-protection-of-online-consumer-boundaries-of-online-persuasion_0.pdf

The Netherlands Authority for Consumers & Markets (2017), *Fintechs in the payment system. The risk of foreclosure*, https://www.acm.nl/sites/default/files/documents/2018-02/acm-study-fintechs-in-the-payment-market-the-risk-of-foreclosure.pdf

The Netherlands Authority for Consumers & Markets (2014) Barriers to Entry into the Dutch Retail Banking Sector, https://www.acm.nl/en/publications/publication/13257/Barriers-to-entry-into-the-Dutch-retail-banking-sector

UK Competition and Markets Authority (2020) *Online Platforms and Digital Advertising - Market Study Report*, https://www.gov.uk/cma-cases/online-platforms-and-digital-advertising-market-study

UK Digital Competition Expert Panel (2019) *Unlocking digital competition*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf

UK Competition and Markets Authority (2017), *The Retail Banking Market Investigation Order 2017*, https://assets.publishing.service.gov.uk/media/5893063bed915d06e1000000/retail-banking-market-investigation-order-2017.pdf

UK Competition and Markets Authority (2016), *Retail banking market investigation: Final report*, https://www.gov.uk/cma-cases/review-of-banking-for-small-and-medium-sized-businesses-smes-in-the-uk

UK Competition and Markets Authority (2018), *Tackling the loyalty penalty*, https://www.gov.uk/government/news/cma-to-investigate-loyalty-penalty-super-complaint

UK Competition and Markets Authority (2018a), *Designing and Testing Effective Consumer-facing Remedies*, Background note to OECD Roundtable, http://www.oecd.org/daf/competition/consumer-facing-remedies.htm

UK Competition Network (2018*) Helping people get a better deal: Learning lessons about consumer facing remedies*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/744521/UKCN_consumer_remedies_project_-_lessons_learned_report.pdf

UK Financial Conduct Authority and HM Treasury (2017), *Expectations for the third-party access provision in Payment Service Directive II*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/630135/Expectations_for_the_third_party_access_provisions_in_PSDII.pdf

UK Competition and Markets Authority (2016), *Retail Banking Markets Investigation Report*, https://www.gov.uk/cma-cases/review-of-banking-for-small-and-medium-sized-businesses-smes-in-the-uk

UK Financial Conduct Authority (2019) Sector views, https://www.fca.org.uk/publication/corporate/sector-views-january-2019.pdf

UK Financial Conduct Authority (2018) Strategic Review of Retail Banking Business Models, https://www.fca.org.uk/publications/multi-firm-reviews/strategic-review-retail-banking-business-models

UK Financial Conduct Authority (2016a) *Price discrimination and cross-subsidy in financial services*, Occasional Paper No. 22, https://www.fca.org.uk/publication/occasional-papers/op16-22.pdf

UK Government (2020) *Smart data: putting consumers in control of their data and enabling innovation*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/915973/smart-data-consultation-response.pdf

UK Government, Department for Business, Energy and Industrial Strategy (2018) *Modernising Consumer Markets: Green Paper*, https://www.gov.uk/government/consultations/consumer-green-paper-modernising-consumer-markets

UK Open Banking Working Group (2016), *Unlocking the potential of open banking to improve competition, efficiency and stimulate innovation*, http://dgen.net/1/The-Open-Banking-Standard.pdf

U.S. Congress 116th (2020) *Keep Big Tech Out Of Finance Act*, H.R. 4813, https://www.congress.gov/bill/116th-congress/house-bill/4813?s=1&r=6

U.S. Department of the Treasury (2018) *A Financial System That Creates Economic Opportunities Nonbank Financials, Fintech, and Innovation*, https://home.treasury.gov/sites/default/files/2018-07/A-Financial-System-that-Creates-Economic-Opportunities---Nonbank-Financi....pdf

World Wide Web Consortium (2017), *Data on the Web Best Practices*, http://www.w3.org/TR/dwbp/#useanAPI

World Bank (2021), World Development Report "Data for better lives", https://www.worldbank.org/en/publication/wdr2021#:~:text=World%20Development%20Report%202021%3A%20Data%20for%20Better%20Lives%20explores%20the,individuals%2C%20businesses%2C%20and%20societies.&text=And%20yet%20much%20of%20the%20value%20of%20data%20remains%20untapped.,-Data%20collected%20for

YouGov (2018), *Custom Research on Open Banking in UK*, https://yougov.co.uk/topics/finance/articles-reports/2018/08/01/three-quarters-britons-havent-heard-open-banking