

WORKING PAPER

# Digital transformation and competition in the financial sector

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## Summary

The digital transformation has opened up financial services markets to new providers, both emerging businesses known as fintechs and, more recently, large technology companies. The latter have great disruptive potential within the competitive landscape due to their size and the characteristics of the digital ecosystems in which they integrate financial services. This article explores how the scope of this integration is, in part, dependent on the financial regulatory framework, rules on access to data and competition policy.

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## 1. Technological change and the competitive environment

The generation, storage and transfer of information is a core element of financial sector operations. Customers' financial claims and liabilities are recorded as data bits, payments and transactions take place through information flows, and the analysis of data allows financial institutions to better assess the creditworthiness of potential borrowers. These are only some of the examples that show the extent to which the financial industry has, since the outset, been based on the processing of information. This explains why historically it is one of the sectors that has invested most in information and communication technologies (ICT).

Since the late 1970s, with the emergence of the first mainframe computers in the corporate headquarters and, later, PCs in bank branches, financial institutions have sought to gradually computerise operations and internal processes which were extremely paper- and manpower-intensive (Ontiveros et. al, 2012). This first wave of ICT adoption allowed increasingly complex operations to be processed ever-more efficiently. The larger economies of scale resulting from automation pushed the financial sector forward to enter into mergers and acquisitions to take advantage of efficiency gains.

If there is something that distinguishes the most recent wave of digital transformation, it is that in addition to introducing new efficiency improvements, it has significantly altered the way financial institutions relate to their customers, giving rise to new services and business models and reducing some of the barriers to entry that made the financial sector a relatively static market. The result is an ongoing disruption that is transforming the competitive landscape and the structure of the financial services market. Behind these changes are three main technological advances: (i) broadband networks and smart mobile devices, (ii) cloud computing services and (iii) the exploitation of big datasets and the use of artificial intelligence.

The expansion of landline and mobile broadband networks and the generalised adoption of smart devices has led to the appearance of new distribution and customer service channels – firstly e-banking websites followed by mobile banking apps. Consumers, who are used to immediacy, ubiquity and simplicity in digital services such as social media and e-commerce, have readily taken to these new channels for their day-to-day operations, especially the younger generations. From a competition perspective, online sites and mobile apps allow providers to target wider markets, benefiting from economies of scale without the need to roll out and maintain an extensive network of physical branches. This offers an opportunity that new providers of financial services are exploiting with a markedly digital distribution model. Digital channels also tend to improve the comparability of the products and services offered by different providers as well as reducing the costs incurred by consumers in switching from one provider to another.

In addition to the permanent connectivity offered by broadband networks and mobile devices, another of the major technological advances that explains the digital transformation is the ever-increased and cheaper computing power, a necessary condition in order to process a volume of operations that has grown exponentially in the digital era. Cloud computing offers greater efficiency, flexibility and scalability than traditional centralised systems. Companies can consume on-demand computing and software capacity, thus benefiting from economies of scale from the cloud, regardless of their individual size. This replacement of capital investment with operating expenses lowers one of the barriers of entry to markets such as financial services which are intensive in the use of ICT.

The third great technological advance that has contributed to the digital transformation – the exploitation of big datasets and the use of artificial intelligence – is directly related to the previous ones. The interaction between companies and consumers via digital channels has created a veritable explosion in the amount of data available, while greatly increased computing capacity has meant it can now be processed and exploited by new predictive tools. There are already numerous use cases of big data and artificial intelligence in the financial sector, and those will only increase over time. For instance, the use of new sources of data in the analysis of credit risk, the identification of transactions that are suspicious of money laundering or fraud, a greater personalisation of commercial offers, automated financial advice etc. The competitive effects of all these changes might theoretically go in different directions – on the one hand, current market providers already have vast amounts of customer financial data, which could give them a further advantage; on the other hand, the availability of new sources of data may allow new players to get via alternative ways information that is relevant to compete in the financial services market. This is why the concentration or distribution of data within the digital economy as a whole and the conditions of its accessibility and usability have a massive bearing on the competitive landscape.

As we have previously explained, the use of digital channels and cloud computing services has lowered some of the barriers to entry to the provision of traditional financial services. In addition to that, the technological advances outlined above have, when taken as a whole, led to the emergence of new business models which satisfy consumers' financial needs through a different structure. Digital platforms and marketplaces are a clear example of this. Online communications have reduced transaction costs (the search for counterparts, the negotiation and monitoring of contracts etc.) between individual agents who are geographically dispersed, and this has allowed the emergence of platforms that put borrowers and lenders in contact with each other and that facilitate their transactions through trust mechanisms that reduce information asymmetries (Coyle, 2016). This change is important for an industry such as finance, in which information asymmetries have traditionally been an important source of added value and have justified some regulations.

In conclusion, new digital technologies have been key to the opening up of the financial services market – one which has traditionally been relatively static – to new providers, creating a new competitive environment that is in full swing.

## **2. From the unbundling of the value chain to its integration in digital ecosystems**

The new companies who have taken the opportunity of the digital transformation to break into the financial sector have become known as *fintechs* – a portmanteau of the words "finance" and "technology". These emerging companies tend to specialise in a specific financial product or service, sometimes also targeting a particular customer segment (Arner et al, 2016). In general, they operate in those areas of the financial sector which are not subject to a heavy regulatory burden and which are not capital-intensive, such as payments and transfers. This is where the majority of fintech activities are concentrated, along with credit-related services that are not based on deposit taking (such as crowdfunding platforms) or applications that help customers to manage their personal finances (such as account aggregators and automated financial advice services).

By specialising in a specific financial product or service, fintech companies have unbundled the banking sector value chain, which was traditionally unified under the universal banking model which seeks to satisfy the overall financial needs of the customers (Ferrari, 2016). Within this new environment, banks and other new players are competitors within individual elements of the value chain while increasingly working together in other areas. In some cases, fintechs offer their technology and solutions to the banks, while in others, banks have incorporated third-party products and services within the value proposition they offer to their customers.

In recent years, another kind of players have entered the financial sector: large technology companies with consolidated positions in other digital markets. Examples of these are Amazon, Facebook and Apple in the US and Europe and Alibaba and Tencent in China. Like the fintechs, these companies also offer specific financial products and services, unbundled from the banks' value chain but nevertheless incorporated within their own value proposition. A common aspect of the general strategy employed by such companies is that of building around their customers an ecosystem of products and services (social media, e-commerce, search engines, operating systems, app stores etc.) that are inter-connected between them.

The incorporation of financial services within digital ecosystems may potentially alter the structure of the financial sector. The reasoning behind such a statement is that the digital ecosystems of large technology companies already have millions of active users, as well as having a series of characteristics that give them certain power in the markets in which they operate and help them to break into new ones. Above all, there are three such characteristics: (i) they develop network effects, (ii) they have a position of gatekeepers or entry points to related markets and (iii) they generate and exploit massive amounts of data.

The network effects of digital ecosystems are generally both direct and indirect. The former stem from those services that allow users to connect to and interact with each other, just as social media platforms do. The latter appear in marketplaces that serve as intermediaries between different types of agents, such as consumers and providers within an e-commerce platform, or developers and users within a mobile app store. Network effects mean that when a service reaches a certain critical mass of users, the company benefits from a positive feedback loop that facilitates market concentration (Evans and Schmalensee, 2007).

Digital ecosystems also feature products and services which, due to their nature, serve as gatekeepers or entry points to related markets. Such is the case, for example, with mobile operating systems, which set the conditions required to create and distribute applications, or with search engines, through which users access digital content and e-commerce websites. This means that digital ecosystems can exercise a certain degree of control over other products, allowing them to use this position to compete on these related markets. This is what some mobile operating systems have done by developing their own smartphone payment services.

The third key aspect required to understand the power of digital ecosystems is that their products and services create, aggregate and exploit vast amounts of user data. This gives them a competitive edge for a number of reasons. Firstly, the accumulation of pertinent data allows them to benefit from learning effects or dynamic economies of scale, ever increasing the quality of the services they offer. Secondly, as the data obtained in the provision of a service can be reused to develop and/or distribute other products and services, these companies

also benefit from economies of scope (Autorité de la Concurrence and Bundeskartellamt, 2016). Lastly, data can have a lock-in effect for users, as the personalisation and storage of personal data within a service may increase the cost of switching from one provider to another.

These digital ecosystem characteristics create multiple synergies within the products and services they consist of. As a result, ecosystems not only add services to have new sources of direct revenue but also to strengthen the ecosystem as a whole by attracting new users and connecting them further, ensuring control over key markets and creating new data sources. This explains why digital ecosystems extend their activities to products and services which are traditionally offered by different types of companies, a factor that is breaking down the barriers between the various business sectors.

Financial services can play a variety of roles on a non-exclusive basis within a digital ecosystem: (i) transactional services (payment methods) for exchanges carried out within the ecosystem, (ii) services which complement other ecosystem products, such as the credit and insurance services offered to users (consumers or providers) on an e-commerce platform and (iii) financial services which might be a further, relatively independent component of the ecosystem, as would be the case with a mobile payment service for in-store purchases or with personal finance management apps.

The inclusion of financial services within digital ecosystems which, by their very nature, tend to market concentration could drastically alter the current structure of the financial sector. This is not so much because ecosystems replace current providers – at least not for all financial products and services – but rather due to the control that ecosystems can exercise over the relationship with customers and, by extension, the marketing of financial services and the distribution of profit margins.

In any event, impact will depend on the extent to which financial services are integrated into the digital ecosystems of large technology companies, on the degree of involvement of these companies in the final provision of the services and on the ability of financial institutions to develop their own differentiated value propositions, mirroring some of the characteristics of the digital ecosystems outlined above. These variables do in turn depend on certain relatively external factors, such as regulation and competition policy. The burden of financial regulations hinders the entry of digital ecosystems into those services subject to more demanding rules with implications for the provider entity as a whole. Notwithstanding, new regulations covering payments and data access make it easier for new competitors to break into certain financial services. The role that competition policy might play can be explained by the dominant position held by large technology companies in a number of digital markets. This subjects them to the scrutiny of the competition authorities and may result in limitations being placed on the practices they employ to intervene into new markets. In the following sections we will be further discussing these regulatory and competition-related aspects.

### 3. The role played by regulation

Banking is a highly regulated sector due to the important role it plays in payment systems and the financing of the economy as well as to its vulnerability to a loss of public confidence. This has resulted in a series of public policy interventions which seek to ensure financial stability, including deposit insurance, last-resort lending and prudential regulation.

Deposit insurance schemes seek to assure the power of bank-account payments to clear debts, limit the incentives for customers to withdraw deposits at the first indication or rumour of weakness of an institution (bank runs), as well as limiting the contagion effect. The insurance is generally funded by financial institutions, with an implicit guarantee from the state. Last-resort lending provides emergency liquidity to solvent yet illiquid institutions. Central banks are the only institution that are able to offer the necessary amounts with due speed. Lastly, prudential regulation seeks to limit risk of loss for the previously-mentioned safety nets by ensuring sufficient levels of capital, provisions and liabilities with sufficient capacity to absorb losses, as well as appropriate risk control systems.

This series of interventions aim to ensure that financial institutions that are authorised to use the term “bank” have high solvency standards in place as well as reliable safety nets should any problems arise. The crucial difference between banks and other financial intermediaries lies in the collection of deposits from the public, which serves as the fulcrum for the retail payment system. As has been mentioned above, the power of deposit-based payments to clear debts requires a considerable level of public confidence. For this reason, the authorities have established a clear barrier between what constitutes a deposit and what does not, and therefore what constitutes a bank and what does not. The regulatory and supervisory implications of crossing this barrier have kept the new entrants at some distance from the collection of deposits from the public.

Banks are subject to other regulations which are not directly related to their role as deposit takers, although they may be equally burdensome and demanding in terms of compliance. An example of this is the body of regulation concerning anti-money laundering and combating the financing of terrorism (AML/CFT), which leverages the central role that banks play in financial flows in order to limit or control illicit economic activities, through very demanding know your customer requirements. It is important to understand that these regulations are not related to the concerns for financial stability that are behind all banking regulations, nor are they intrinsically bound to financial activity. The authorities exploit the banks' infrastructure and the key role that they play in the economy's payment flows in order to pursue different aims which are not particularly related to the banking sector. Therefore, as new ways of moving money in the economy arise, AML/CFT regulations have incorporated new entities bound by these obligations, such as electronic money issuers or crypto exchange platforms.

In this article we are mainly interested in a third line of regulations that have a bearing on the financial sector and which pursue competition and consumer protection goals. They are of a different nature to the regulations related to financial stability and the prevention of money laundering. In such a case, the aim is to ensure that financial service providers operate efficiently and that they do not benefit abusively from the information asymmetries that are inherent to financial intermediation activities.

Of course, all of these regulations are related: they complement each other, interact and require balance. For example, financial stability contributes to consumer protection (to the extent that consumers are the main victims of financial crises), and the prevention of money laundering benefits both financial efficiency and stability in the long term.

Financial stability and competition would seem to be contradictory goals: an excessive emphasis on competition could jeopardise the weakest competitors, leading to bankruptcies and instability, while too strong a focus on stability could result in inefficiencies which could end up hitting bank customers, both savers and borrowers. However, this trade-off between the two objectives is confined to the short term. In the long term, only an efficient financial system is truly stable. Artificial stability, at the price of a scarcely competitive market, creates weakness over time which ends up undermining solvency.

Regulations which focus on competition and consumer protection are generally specific to each type of financial products and services and do not usually affect the provider entity as a whole, unlike prudential banking regulation. As digital transformation has given rise to new business models and services, the regulatory framework has also evolved and expanded in order to tackle the risks and information asymmetries that are inherent to the new activities. The regulations for crowdfunding platforms provide a good example of this evolution. A regulatory framework that is proportional to the risk posed by new activities could bolster their development by offering greater certainty and confidence to both providers and potential customers.

In some cases, in addition to reacting to market changes, regulation has played a proactive role in opening up the financial sector to new competitors, above all in the retail payment space (González-Páramo, 2016). The best example of this is probably the new European Payment Services Directive (PSD2), which obliges banks to open up their systems to other players, who, with the authorisation of their customers, can access bank accounts in order to offer payment initiation services and account information services<sup>2</sup>. The new directive sets out the authorisation requirements applicable to the new providers who wish to offer such services. This is an opportunity which may be exploited by fintechs specialising in one or more financial services or by companies with more extensive digital ecosystems, as we explain in the second section of the article.

The opening-up required by PSD2 has a series of implications for the financial sector's competitive panorama. Payment initiation services have a direct impact on the retail payment market. The ability of third-parties to make bank transfers on behalf of customers means that new payment instruments, based on the direct movement of funds from between accounts, may compete with debit and credit cards in retail payments, especially online. While the movement of funds continues to take place within the banking infrastructure, banks lose the direct relationship that they have with the customer at the moment of payment and become mere providers of the underlying infrastructure. Meanwhile, account information services which aggregate data from the customer's transactions with various entities increase the comparability between payment account services and reduce the cost for the

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2: PSD2 defines the former as services which "initiate a payment order at the request of the payment service user with respect to a payment account held at another payment service provider". The latter are online services which "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".

consumer of switching from one provider to another by offering a common repository of their transactions. As is the case with payment initiation services, they also serve as interfaces or intermediaries between the customers and financial institutions, reducing the direct relationship between the two (González-Páramo, 2017).

Lastly, although no less importantly, account information services have access to customer financial transaction data, whose value goes beyond the accounts and payment services market. This data provides companies with information on a customer's consumer habits and patterns, allowing them to ascertain their credit and savings needs and analyse their risk profile. As PSD2 facilitates access to this data by other banks and new players, competition for a range of financial products and services may increase.

We should bear in mind here that, as we outlined in the second section, the aggregation and exploitation of big datasets is one of the key characteristics in understanding the power that digital ecosystems accumulate. For this reason, the relationship between access to data and competition in digital markets is given special attention in the following section.

## **4. Data and competition in digital markets**

Although access to data and information has always been a competitive asset for companies in all sectors, it is even more important in the digital economy as many products and services are data-based and new processing capabilities and analytics techniques allow a more intensive and sophisticated use of data. This exploitation allows companies to improve the quality of the products and services they offer, triggering a positive feedback loop: the higher quality attracts new users and increases the participation of existing ones, giving access to a greater amount of data and ensuring ongoing product improvement. Data may also be used to develop and/or distribute products and services other than those that the original information was obtained from.

These learning effects and economies of scope mean that the concentration of big datasets in the hands of a small number of companies – a characteristic of digital ecosystems – may create barriers to entry and reduce competition in some digital markets. This is why allowing consumers to move the data they generate from one company to another emerges as a way to promote competition (Prüfer and Schottmüller, 2017). The new General Data Protection Regulation (GDPR) includes a right to the portability of personal data whose effective impact will depend on its practical implementation and development. Without a certain standardisation of data categories and transmission mechanisms it will be difficult for potential data-recipient companies to develop practical use cases.

The new European Payment Services Directive (PSD2) also facilitates the movement of data between companies. However, these information flows are not symmetrical or reciprocal, as there are companies who, by offering account information services, can gain access to new data sources (payments) without being obliged to make their own consumer data sources accessible. This results in an imbalance in terms of potential access to data between the banks and other players in the digital economy, especially the large technology companies that control digital ecosystems. Thanks to PSD2, they can now gather even more information and further strengthen their position in the markets they already control, as well as in adjacent markets into which they are seeking to expand their ecosystems. Financial services are or might well be one such market.

## Competition policy

As we have previously said, the expansion of digital ecosystems into financial services is conditioned by regulations, which sometimes pose an obstacle (as in the case of prudential regulation) while on other occasions they act as a facilitator (such as with new payment regulations). Another increasingly important factor in this expansion is antitrust or competition policy. As large technology companies have acquired dominant positions in various digital markets, such as search engines and mobile operating systems, their conduct has come under scrutiny from the competition authorities. The aim is to prevent abuse of their dominant position and exclusion of competitors for reasons other than the merit of their products.

While each competition case requires detailed analysis of the specific circumstances and effects, potentially anti-competitive practices of digital ecosystem are generally related to the connections they establish between the different products and services they offer, normally with a view to exploiting their dominance in one market in order to extend it to others. These connections may be the tying or bundling of products (i.e. conditioning the sale of a product to the purchase of another, or the exclusive sale of various products within a bundle or under beneficial conditions) or the use of the position of the ecosystem as an intermediary or gatekeeper to other markets in order to give preferential treatment to their own products and discriminate against those from third parties. There is a wide range of potentially anti-competitive practices with a multitude of nuances. It would be impossible for us to give a comprehensive explanation here. Furthermore, certain characteristics of digital markets (multi-sided, zero prices, data as a key input for production etc.) present technical challenges to the competition authorities when seeking to identify relevant markets and appropriately analyse anti-competitive practices (OECD, 2016).

Especially in the European Union, the competition authorities have imposed significant sanctions on digital ecosystems for the sort of practices outlined above. In June 2017, the European Commission fined Google 2.42 billion euros for abusing its dominant position in the online search market by giving an illegal advantage to its own shopping comparison service (Google Shopping). In July 2018, the tech giant was handed a second fine of 4.34 billion euros for illegal practices related to Android mobile devices. On both occasions the fines set new records for the biggest sanctions ever imposed by the European Commission to a single company.

Nevertheless, it is hard to see how the ceasing of the anti-competitive practices – imposed by the European Commission in addition to the monetary fines – can reverse the impact that they have already had on the structure of markets, once dominant positions are well established. This has led to calls for more drastic measures such as the introduction of *ex-ante* neutrality requirements that ensure non-discrimination in the way that digital platforms treat their own and third-party products and services. For the moment, these are only theoretical discussions, although the climate of growing concern regarding the power accumulated by large technology companies and a fear of possible regulatory interventions could persuade them to adopt more open competition strategies in the expansion of their digital ecosystems.

## 5. Conclusions

The digital transformation of the economy has radically altered the structure of a number of business sectors, from the content industry to the retail sector. The impact can also be seen in the financial sector, albeit more slowly, partly due to the burden of financial regulation. New fintechs have started to compete in specific financial services and, more recently, large technology companies have begun to incorporate financial products within their digital ecosystems. This expansion represents a potentially considerable disruption to the financial sector due to the size of these companies and the characteristics of the digital ecosystems they develop. However, the final extent of this expansion is uncertain and is, in part, dependent on the regulatory and competition policy framework. Although we should resist the temptation to try to predict the future, it is more likely that digital ecosystems actively intervene in the marketing and distribution of financial products than in the final provision, at least in the most regulated areas, such as the collection of deposits.

The integration of financial services into digital ecosystems that tend to rise to dominant positions on the markets in which they operate poses challenges to financial stability, competition and consumer protection. Certain risks may concentrate on a very small number of players that reach an importance similar to that of critical infrastructures. Meanwhile, the separation of the production and distribution of financial services may cause a misalignment of some incentives, creating moral hazard problems in the origination of loans, or may lessen certain consumer protection responsibilities.

Financial regulators and supervisors should closely monitor how the market evolves, identifying emerging risks and, wherever necessary, adjusting the regulatory framework to ensure financial stability and consumer protection while also encouraging fair competition. Within a context in which different types of business models and providers coexist to an ever-greater extent, this means moving toward a regulatory and supervisory framework based more on activities and risks than on the type of entity undertaking them.

Promoting fair competition also requires regulations on data access and portability that are reciprocal and do not create asymmetries between different types of players. Otherwise, they may have the unintended consequence of contributing to, rather than mitigating, the tendency of digital markets towards concentration in a few large companies that accumulate large amounts of data and extend their power from one market to another. The role of data protection and competition authorities here is vital to prevent an undermining of the rights of users as data subjects and companies abusing their dominance by restricting competition.

In this context, authorities face the challenge of how domestic policies can be successfully applied to global companies and digital ecosystems. It is difficult for domestic authorities to regulate and control services that move freely across the Internet and national borders. Some countries, notably China, have introduced intrusive measures which seek to isolate digital markets, although in general the national authorities see themselves to some extent as being powerless.

Europe is a groundbreaker in this regard, with an institutional framework that provides an authority such as the European Commission powers over the protection of the internal market. These are cross-border powers, to the extent that this term can be used within the EU. Some European standards tend to become a reference for other countries and regions. For this reason, the importance that the EU is placing on data protection and competition policy is very relevant to the global discussion of digital markets. This debate raises the question of whether an international body may be needed – perhaps under the umbrella the G20 – to promote a greater coordination in matters related to privacy and competition.

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