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MARKOS ZACHARIADIS

PINAR OZCAN

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The API Economy and Digital Transformation in Financial Services: The case of Open Banking

Markos Zachariadis[a,*] and Pinar Ozcan[b]

[a] *Information Systems & Management Group, Warwick Business School, University of Warwick, and FinTech Fellow, Cambridge Digital Innovation, University of Cambridge, Scarman Road, Coventry, CV4 7AL, UK.*
[b] *Strategy & International Business Group, Warwick Business School, University of Warwick, Scarman Road, Coventry, CV4 7AL, UK.*
[*] *Corresponding author. Tel.: +44 (0)24 765 22145. E-mail address: markos.zachariadis@wbs.ac.uk.*

Abstract

In this paper we seek to do two things. Firstly, by exploring the fundamental properties and various applications of *open application programming interfaces* (APIs) mentioned in extant literature, we articulate what are the relevant theories that give rise to the new organisational structures and platform business models we observe in the digital age. Understanding such phenomena will help us anticipate, and in some ways predict, the implications of *public APIs*' adoption in the financial services sector. The second part of our paper exposes some of our findings around the key challenges and opportunities that *open APIs* pose for the banking sector in the UK and the EU following the introduction of the Open Banking Working Group (OBWG) and Second Payments Services Directive (PSD2) regulatory frameworks. Our insights were produced from extensive field research and interviews with key industry experts between July 2016 and February 2017. Our use of theory helps us translate these findings and provide recommendations for financial institutions, FinTech startups, technology companies, and regulators. We hope to help them prepare for some of the key changes and issues that the financial sector may be facing in the next few years as the use of *open APIs* becomes more 'mainstream'.

Keywords

Open Banking; APIs, Digital Platforms; Banking as a Platform; Digital Strategy

1. Introduction

Technological and digital innovation has often been credited with having significant strategic implications for firms by shifting the competitive landscape and changing the market dynamics in an industry (Porter, 1985). It is also believed that technological change and intensified competition in a sector can potentially offer benefits to end customers through the quality increase and lower prices of products and services (Matsa, 2011). The recent wave of digitisation in the banking industry – more specifically in payments – and the use of access and network technologies have created various opportunities for new entrants such as *FinTechs* and *challenger banks* to claim some market share, but also for established banks to reconsider their market position and rethink their value proposition to their customers. In this context, banking institutions can choose either to embrace change through the opportunities that technology offers by interacting with the greater ecosystem of market participants and other service providers, or to defend their position by focusing their efforts on developing competitive solutions for all customer and product segments and limiting access to their systems. The recent announcement of the newer version of the payment systems directive (PSD2) to be implemented in 2018 across Europe, as well as the open banking initiative in the UK (OBWG) push towards the creation of an open-banking environment through the introduction of open application programming interfaces (APIs) but the question still remains: what will the banks' response be to this regulatory change? More specifically, our research explores this strategic choice faced by banks as well as the potential benefits of open APIs for banks and their customers by responding to the following questions:

- What changes will open APIs bring to banks' organisational structure and competitive position in the market?

- Will a 'platform' strategy be profitable for incumbent banks that own most of the deposit and lending market share? How will challenger banks position themselves in this landscape?

- Is the introduction of APIs going to bring improvements in the banking services?

- What are the risks and challenges involved both for the banks and their customers?

In discussing the above, this paper is structured as follows. First, we explore, the relevant economics, strategy, and information systems literatures to get insights on how APIs and platforms are conceptualised in these respective fields. Due to the emergence of the API economy and platform business models, the nature of the organisation as well as its structure is different today than it has been traditionally. By understanding the economic theories that trigger these changes, we may be able to anticipate how these changes will unfold in the banking sector and possibly try to manipulate the parameters to have a successful outcome. In this process, we need to consider some critical implications such as how to redesign firm strategy with a more open, inclusive, and community-building perspective.

In the second half of the paper we present our findings from field interviews with 40 key industry informants, which include various banking professionals, heads of

innovation at incumbent banks, executives at FinTech startups and challenger banks, regulators, senior consultants, and investors. Our dataset also includes notes from more than 20 FinTech and open APIs in banking-related events as well as a thorough collection of practitioner and regulatory reports in the field. The application of platform business models in banking, often referred to as “Banking-as-a-Platform” (BaaP) has captured the interest of many practitioners, policy makers and research scholars, leading them to think what the banking sector could look like following the anticipated digital transformation. Our aim was to identify the challenges and barriers but also the opportunities from such an endeavour.

Regulatory context

The second Payment Services Directive (PSD2) is a regulatory framework for payment services that came into existence in January 2016 and follows up from the original PSD of 2009. Both the initial directive and PSD2 set out and extend the information requirements, rights and obligations of payment service users and providers (PSPs) that facilitate the transfer of funds (Payments UK, 2016). Generally, the key aims of the PSD2 are to integrate further and support a more efficient EU payments market, as well as promote competition in an environment where new players such as FinTech startups and a new generation of payment products and services are emerging. Regulators anticipate that PSD2 will increase innovation in the sector and thus provide higher transparency, security, quality of service as well as lower prices for users.

In order to encourage further competition, PSD2 requires banks to grant third party (e.g. PSPs) access to their customers’ accounts and payment services securely following customer consent. In this context, Application Programming Interfaces (APIs) have been deemed as the most reliable and tested technology to facilitate secure and reliable access to customers’ accounts, even though the technology is not directly mentioned in the directive. Following this obligation, the PSD2 regulatory framework outlines the functions and responsibilities of Account Information Service Providers (AISPs) and Payment Initiation Service Providers (PISPs). Account information service is an online service that will provide aggregated information on one or more payment accounts held by the customer (e.g. transaction history and balances) with either another PSP or with more than one PSP. Such service could be provided by banks, FinTechs and other non-traditional financial services firms as well as retailers and social media and telecom companies. Similarly, payment initiation services will also allow such companies and merchants to initiate online payment orders at the request of the customer with respect to a payment account held at another PSP.

In parallel to the EU regulatory reform, in August 2015 the UK Government through the HM Treasury ordered the establishment of an Open Banking Working Group (OBWG) in order to deliver a framework for the design of an open API standard in banking. The following year the Competition and Markets Authority (CMA) published various provisional recommendations and subsequently mandated nine major UK banks to form an Implementation Entity in order to set up the common technical standards underpinning open banking in the UK. In contrast to PSD2, the Open Banking initiative in the UK has been more explicit around the definition and development of the required APIs, as well as the security and messaging standards.

While PSD2 and Open Banking in the UK have not been yet transposed into national law, many providers have already started the process of outlining their strategies to take advantage of the opportunities that the new payments ecosystem will create. However, it is still unclear what the effect of such regulation will be and whether this will indeed create new opportunities for the various actors in the market and in what way. Prior regulatory reforms with the aim to enhance competition in various EU network industries such as telecommunications, energy and transport, have generally been associated with long term lower price levels, expanded outputs, and labour productivity gains (Martin, et al., 2005). Empirical findings also tend to confirm that, ultimately, such reforms improved consumers' welfare and led to better quality of services and investments in R&D and innovation. However, such results often depend on the capacity of the industry participants and the labour market to adjust to the new economic situations.

Examples from energy and telecommunications sectors show that this kind of regulatory intervention aims to infuse competition at industries where incumbents retain a dominant position and market power that leads to monopolistic behaviour at the expense of the end customer. By allowing third party access to the existing transmission and distribution network of incumbents, regulators help "unbundle" or "separate" services to create a more level playing field. Regulators can use such regulatory approaches along with advanced technology to tackle issues such as price discrimination, cross subsidies, and high barriers to entry that are often present when incumbents hold high market power with limited competition. It still needs to be seen what effects such policies will have in the banking sector and how incumbent companies as well as new entrants will respond. The next two sections discuss the role of open APIs and digital platforms in facilitating this kind of regulatory reform.

1. Deconstructing APIs

At a very basic level, an *application programming interface*, or *API*, is "a way for two computer applications to talk to each other over a network using a common language that they both understand" (Jacobson et al., 2012). Editor-in-Chief of ProgrammableWeb.com, David Berlind describes APIs as "electrical sockets that have predictable patterns of openings"[1] into which, other applications that match those patterns can "plug in" and consume them in the same way electrical devices consume electricity. While these sound like generic statements, the benefits and functionality of APIs can be much clearer when we consider the context in which they are realised. For example, APIs can be used by firms *internally*, to integrate diverse systems and allow for the exchange of data across different departments by performing API "calls" or sending queries to an API server. This systematic way of sharing data can make it easier for internal teams to collaborate and access information when and how they need it, thus helping to interconnect services and business processes across the organisation as well as improve employee productivity and even create better omni-channel experiences for customers (Nijim and Pagano, 2014). In a similar way, APIs can also be used to expose business assets such as information, a service, or a product to external audiences, hence, reaching beyond the boundaries of the firm. Such *external* APIs can provide further

[1] https://www.programmableweb.com/news/what-api-exactly/analysis/2015/12/03

integration with company partners and allow third parties to consume organisational data and lead to cross-selling and upselling opportunities down the line.

The distinction between *internal* and *external* APIs introduced above helps us to better understand the benefits of API technology in terms of systems integration and data sharing within and across firms. Scholars suggest that at the heart of systems integration are the principles of interoperability and modularity (Bodle, 2011). In their work "*Design Rules*", Baldwin and Clark (2000) discuss how modular designs can be superior to interdependent designs because they provide more flexibility and alternative options. Drawing from examples from the PC manufacturing sector between the 1950s and 1990s, they assert that modular architecture in computers led the industry to evolve from a concentrated structure to a highly dispersed sector. In order to govern the system architecture and achieve compatibility amongst the various modules that were produced independently, *design rules* were introduced by platform leaders such as Intel Corp., and followed by all designers and manufacturers alike to ensure that hardware components worked together.

Software systems can be interoperable with the use of standardized data protocols and transparent interfaces in the same way (Cowhey et al., 2009). In this perspective, APIs can "enable interfaces, services, and applications to connect seamlessly with one another, making digital content accessible" between a wide range of independent applications (Bodle, 2011, p.325). API technology provides a customary interface (based on a set of agreed-upon standards) and a layer of abstraction that reduces complexity and allows API-consuming systems to "plug-and-play" without the need to know the specifics of the API-provider's systems. In return, APIs can be consumed like a service and can be "agnostic" to the consuming devices or applications that connect to it. Such interoperability between modular systems can lower technology costs and accelerate innovation as the heterogeneous ICT building blocks can evolve independently and according to demand, available resources, and technological progress (Baldwin and Clark, 2000).

While the benefits of interoperability and 'non-discriminatory standardisation' among heterogeneous technical systems using APIs can be obvious, there is still the question of how open such systems should be. A meaningful way to explore this is to consider *private* versus *public* or *open APIs*. *Private APIs* can either be internal APIs, offered to facilitate within-firm integration and operational efficiency across an organisation or external APIs that are highly customised and designed specifically for partners who want to interface directly with their suppliers or customers. Private APIs are exclusive to staff and third-parties with contractual agreements and usually unnoticeable otherwise. These private APIs are already commonly used by banks and provide incredible value to organisations.

On the other hand, *public* or *open APIs* are accessible by almost anyone and available to use with "little or no contractual arrangement" – beyond agreeing to the terms and conditions put forward by the API provider (Jacobson et al., 2012). This allows organisations that provide open APIs to create digital economies or business platforms, through which, communities of innovators can develop API-consuming applications and pay a fee for using the API. This kind of monetisation of APIs is an essential part of the API-economy. However, as we will see later, the implications of

open APIs are much more far-reaching and can lead to an entirely new way of doing business and competing in the marketplace.

2. The emergence of digital platforms

In the last few decades, we have seen the emergence of platform business models that move away from the traditional vertical integration of the firm (also known as the *pipeline business model*) and introduce a flatter, more inclusive and innovation-centric approach to value creation (Gawer 2009). Central to the platform business model is a *platform* that often "uses technology to connect people, organisations and resources in an interactive ecosystem in which amazing amounts of value can be created and exchanged" (Parker et al., 2016). This organizational formation can facilitate value-creating interactions amongst consumers (demand-side) and external producers (supply-side), and produce a *multisided market* (Rochet and Tirole, 2006). De Reuver et al. (2017) suggest that digital platforms have the advantage of being "editable" and "reprogrammable" which could make them more responsive to incorporating complementary modules from third-party developers in order to extend functionality. But how can a platform bring about such radical changes to an organization or even an entire industry? Gawer and Cusumano (2002, 2008), who studied the emergence of platforms in the hardware and software industries during the 1990s and 2000s, observed how firms such as Intel and Microsoft transitioned from a simple microprocessor maker or software developer to orchestrators of innovation in their entire field. This was achieved by developing a core value proposition or infrastructure in the form of a product, service or technology on which a large number of firms can build complementary products, services, or technologies, thus creating a loosely assembled business ecosystem for innovation (Gawer and Cusumano, 2002).

Following up on the examples above, two key functions that platform leaders aim to deliver are 1) bringing together disparate resources and knowhow from different firms, and 2) matching and connecting users with producers of products. Firms such as Apple, Google, Microsoft, and Linux in the tech sector but also Airbnb, Uber, eBay, YouTube, Facebook, VISA, MasterCard, etc. in other sectors have been using these two principles to build successful digital platforms and take advantage of an entire ecosystem of suppliers and users. An immediate benefit from creating such ecosystems is that platforms have the ability to attract novel sources of value-creation and supply. For example, consider the case of iPhone as a product platform. Apple would have never been able to develop such an immense number of applications by using their organisational resources alone. Instead, by opening up their product and making its features available to an entire community of developers through open APIs, they managed to unlock new sources of value at a much higher rate both in terms of quantity (number of applications) but also in terms of speed (short average time-to-market allowed them to scale much faster) and scope (significant variety of value propositions).

In the context of the digital platform, open APIs are considered as the *boundary resources* through which organisations can share a core functionality based on a software platform and provide the opportunity to external developers to produce modules that interoperate with it (Tiwana et al., 2010; Ghazawneh and Henfridsson,

2013). Carefully produced and signposted API documentation can help cultivate and expand the ecosystem and invite new actors as well as knowledge and capabilities from outside the firm (Van de Ven, 2005). However, as the number and heterogeneity of parties increases, conflicts of interests may arise and risk the contravention of the platform. APIs can be used effectively in order to control and moderate activity and reduce uncertainty amongst parties – e.g. moderating and limiting access to a particular API endpoint (e.g. managing traffic through applying quotas or slowing down calls) can potentially secure the platform and its owner. This becomes especially important when we consider open APIs that are consumed over the internet by "loosely coupled" and temporary users. The *API contract*, which outlines the "terms and conditions" of the service, is of particular importance as it determines how the relevant APIs can be used by third-party developers, and provide information about their structure, guarantees and limitations (Jacobson et al., 2012).

Considering the above, there are two crucial economic theories in a platform business model that are worth exploring in more detail as they are the main reasons that platforms thrive over traditional "pipeline" business strategies. These are the transaction costs theory and network effects.

Transaction costs economics

In economics, transaction costs play an important role to help us understand better the "nature of the firm". Generally speaking, transaction costs are the search costs, the coordination costs, the negotiation costs and the information asymmetry costs an organisation faces while making choices about its production process. Nobel prize winning economist Coase (1937) found that business activity will be organized inside the firm when the cost is lower than the cost of contracting someone from the market. More specifically, he proposed that the costs of perpetual re-contracting with an external firm can be high relative to the expenses of signing a long-standing contract with an employee who would agree to execute the task under the auspices of the employer. On the other hand, Williamson (1979), highlighted that a contractual relationship between a buyer and a seller could be subject to opportunistic behaviour especially if the amount of surplus produced is significantly high. For example, imagine a highly skilled and specialised software developer hired by a bank to develop an AI-driven trading application that could potentially result in unprecedented returns for the bank. If the employee has no stake in the profits, their incentive to work towards this assignment would be little. On the other hand, while the bank would be better off incentivising the employee, it would be difficult to write a complete contract ex ante. In that scenario, allocating production through a market mechanism may be more efficient if the search and negotiation costs are lower.

Generally speaking, this "make/buy" decision is moderated by the transaction costs involved: if the sum of all of the costs, including production and transaction, is cheaper inside the firm than outside, then we get firm boundaries within which business activity is organised (i.e. the firm produces the good, owns the means of production, and has control over employees and their performance). In contrary, if the total costs are lower externally, then the firm sources the means of production outside in the market. According to transaction costs theory, economic institutions have as their primary function the optimisation of transaction costs, however, there is always going to be a trade-off between "markets and hierarchies" (Williamson, 1975)

that will be difficult to control. A platform strategy can potentially be better than a hierarchy or a pure market transaction because it can further reduce the searching, matching, negotiation, and contract costs as well as lower information asymmetries (moral hazard) that are a potential risk to both consumers and suppliers.

In that context, the key value proposition of the platform business model is not about selling products, but "selling reductions in transactions costs" (Munger, 2015). For example, a peer-to-peer file sharing internet service like Napster, where users can engage in economic activity buying and selling audio files, has the advantage of efficient pricing (due to better pricing information on the market) and the reduction of search costs. However, when you interact directly with other users, you still run the risk of purchasing a bad-quality file or committing copyright infringement by accepting an illegal digital copy. When a digital platform like iTunes intermediates this transaction, it has the ability to absorb these transaction costs by ensuring that certain rules apply for economic behaviour, product quality and lawfulness. While this is a key benefit of a platform business model, there is one more element to the platform strategy value-proposition that makes it even more powerful: the network effects.

The power of network effects

Network externalities or *network effects* describe the impact the number of network adopters has on the utility of each user on a platform (Shapiro and Varian, 1999; Farrell and Saloner, 1985; Scott, Van Reenen, and Zachariadis, 2017; Economides, 1996; Zachariadis, 2010). In other words, the marginal benefit (or cost) that platform users gain increases as the number of the users on the platform increases. A good example of this would be Saloner and Shepard's (1995) study that found that as more ATMs are installed, the size of the ATM network grows, making it more valuable for cardholders and banks due to the extra connectivity produced. Network effects can be found in almost any platform and can make a real difference in the value that users gain. An example used frequently in popular press is Uber as a two-sided platform that matches drivers and customers seeking transportation services. As the number of drivers on the Uber platform increases, the better service customers can get because pickup times are reduced and prices are more competitive. This attracts even more customers on the platform, which in turn attracts more drivers. This "virtuous cycle" driven by positive network effects is a fundamental characteristic of platform strategy and can be used for the advantage of the entire ecosystem.

Having said that, network effects are not always positive and growth of users on an open platform can lead to situations where value is being subtracted from the network instead of increased. For example, consider a smartphone platform like iPhone. Most of the time, the growing number of applications would result into a positive benefit for consumers, however, it can also lead to frustration if there is increasing difficulty in finding the best match or if a big number of applications on the platform are of poor quality. This can put off users who can decide to migrate to another platform or reduce their usage. To avoid such situation, the platform leader will need to moderate entry by applying filters, controlling and limiting the access of users onto the platform and potentially even their activities and connections (Parker et al., 2016). This process known as *platform curation* will safeguard the level of quality of service platform users enjoy and will uphold the two factors that make a

platform valuable: the maintenance of low transaction costs and nurturing of positive network effects. *Data feedback loops* from other consumers on the quality and usability of the various offerings will help to distinguish between good and bad services and eventually discontinue or discourage those that have mostly negative ratings.

How open is open enough?

Although openness is a key characteristic of the platform business model, sometimes it is necessary to moderate platform participation in order to avoid negative network effects or compete with other platforms. In making this choice, platform owners or platform leaders will need to decide from a wide spectrum of alternatives from closed-system approaches – i.e. wholly-owned by a firm or set of firms, proprietary, and controlled by a single party – to wide-open platforms – i.e. fully accessible on public domain, no restrictions in development and use, not owned or controlled by a specific party (Boudreau, 2010; Eisenmann et al., 2008). A key trade-off that comes with this decision is that of "adoption versus appropriability" (West, 2003). An open platform approach potentially lessens the profit share of the innovator due to increased competition and lower barriers to entry, and also reduces the possibility of customers being "locked-in" to the platform as switching costs are particularly low. On the one hand, diversity of complementary products may increase as the platforms bring together innovative ideas. But lower profits may also lead to lost incentives and lower participation.

The open vs. closed dilemma is a difficult one to tackle. While having an open platform may create difficulties in monetising the benefits, a closed system may stifle innovation and lead to seclusion. There are plenty of examples where firms ended up "on the wrong side of history" such as Nokia, Myspace, Blackberry, etc. because they did not let outside innovators to add complementary products and tried to do everything 'in-house' with limited resources. A hybrid approach where platform owners invest their resources on a small number of core applications can be a healthier option to provide balance and guide competition. However, platform owners will still need to decide what their core competencies are and what key features they should invest on before opening up the platform to external competition.

In the next section, we take into account the theoretical discussion above, and make an attempt to consider how a platform business model would "play out" in the banking sector. In doing that we contemplate on alternatives around the choice of openness for financial institutions and discuss the strategic implications for banks and non-bank entities as the competition in the market develops.

3. Banking as a platform

It goes without saying that the newly-introduced regulatory frameworks – PSD2 in the EU and the Open Banking initiative in the UK – offer a unique opportunity to apply some of the concepts we discussed above across the entire banking sector in Europe. Opening up the APIs (especially those of payment initiation service and account information service) of banks and instructing them to share customer data provides an opportunity for a platform business model to be implemented and its effects to be realised in banking. This move which has been coined by a few as

“Banking-as-a-Platform” (BaaP) describes the premises upon which banks can adopt a platform strategy model and change the rules of competition. In doing so, banks will need to revisit their role as financial intermediaries and prepare to become re-intermediaries by providing “online automated tools and systems that offer valuable new goods and services to participants on [all] sides of the platform” (Parker et al., 2016; p.71). In competing with other bank platforms in the sector, the leanest and most attractive experience for both developers and wholesale and retail customers will prevail. In doing that banks will need to cultivate and manage growth in all sides of their platform whilst keeping and investing in some core applications central to their value proposition. The formation of such an ecosystem will increase the possibility of transaction costs staying low and ripping the benefits of network effects and data feedback loops. As part of this digital transformation and the move to an open-API economy, banks and other licensed institutions that hope to become platform leaders will also need to decide on the level of openness with which they wish to engage their community.

BaaP openness and taxonomy

A few FinTech experts and finance practitioners have tried to provide a taxonomy of platforms in the banking sector distinguishing between banking-as-a-platform, banking-as-a-service, marketplace banking, etc. (Brear and Bouvier, 2016), and other kinds of organisational arrangements in banking. While useful, these are more paradigmatic rather than a systematic way of conceptualising platform-based strategies that satisfy particular roles and characteristics. A useful breakdown regarding the different premises platform-mediated networks can encompass is provided by Eisenmann et al. (2008) who identified four distinct functions that most platforms need to decide on based on their level of openness. These are: 1) *demand-side platform users*, often referred to as “end users”; 2) *supply-side platform users*, these are resourceful application developers who offer complements for the core platform; 3) *platform providers*, who serve as users’ primary point of contact with the platform and provide the infrastructure; and 4) *platform sponsors*, who “exercise property rights and are responsible for determining who may participate in a platform-mediated network and for developing its technology” (p.1). Deciding on each of the above, will give rise to different strategies for exercising openness in the context of platform banking but also helps to define how open “open banking” is in each instance.

While in the banking sector not all characteristics equally apply as in the technology sector, it would be worthwhile to try to think through them and map existing initiatives onto this framework. In doing that, we can provide some structure to the thought process by pointing out the different “openness” choices any bank or non-bank institution can make in adopting a BaaP model.

	Open Source API Platforms (e.g. Open Bank Project)	**Banking API Platforms** (e.g. Token, Fidor, etc.)	**Challenger Banks** (e.g. Monzo, Starling, No26, etc.)	**Most Incumbent Banks**
Demand-Side User (End Customer)	Open	Open	Open	Open
Supply-Side User (FinTechs)	Open	Open	Open	**Closed**
Platform Provider (Hardware/OS Bundle)	Open	Open	**Closed**	**Closed**
Platform Sponsor (Design & IP Rights Owner)	Open	**Closed**	**Closed**	**Closed**

Figure 1. Varieties of openness in a platform-banking ecosystem (adapted from Eisenmann et al., 2008).

So far incumbent banks haven't established a comprehensive open banking model that allows application developers to tap into their APIs and develop value-added service applications on a "plug-and-play" mode. This naturally puts them on the far-right category with a platform that is only open for some prospective demand-side users under specific terms. On the other hand, challenger banks were quite quick in establishing themselves as "platform banks" (often through successful developer's portals that contain detailed API documentation), with Monzo, Atom, Number26 and Starling Bank already in collaboration with FinTechs (e.g. TransferWise). Most challenger banks have developed (or acquired) the hardware and software for their core infrastructure and middle layers where their API platform stack sits. Apart from a few exceptions (e.g. Fidor, but others also apply), most of the challenger banks maintain their hardware/operating system closed to other institutions.

Further down the line, we also find platforms that are "bank agnostic" and have API offerings that can be adopted and used by any institution that demands such a service. This would be the equivalent to Windows which is closed at the sponsor level but open with respect to other roles as it can be installed in many different hardware machines and be used independently. Examples of such banking API platforms would be Token in the UK and US, and Figo, which has become well-known in Germany where, in principle, open banking was introduced much earlier due to prior regulation. Finally, the last category is open with respect to all four roles including the design and IP of the software, which is quite rare in banking. Perhaps the closest example would be the Open Bank Project (OBP) platform from Germany

that comes with an open source licence and is free for anyone to install and test. For such a platform, openness at the sponsor level also means greater openness at the user level. In addition, from the developer's side, any party can contribute improvements to the source code, which spurs innovation. However, this is deemed to be costly and significant variations would stay in-house.

Platform wars and the "Platform-as-a-Bank" threat

Platforms change the nature of competition as businesses aim to facilitate interactions between producers and consumers, competing on network effects and value captured onto the platform to win market share. On that basis, the most attractive platform would be the one with the most appealing value propositions for clients on both sides of the market, enhancing network externalities and thus customer retention.

In an environment where open data drives flatter rents and lower prices, the ability to engage customers with better experiences through more valuable applications may act as counterincentive to move to a different platform. The more the opportunities to create value for customers on a particular platform, the less inclined customers will be to leave, thus creating a customer "lock-in effect". In this context, openness can be managed in order to maximize positive network externalities and win more customers (Van Alstyne, et al., 2016). For example, banks should be able to match customers' demands with respective services and user experiences that cannot be found in other platforms. Failing to do so will decrease consumer confidence in the particular bank. To avoid such frustration, platform banks need to use customer data more effectively to track preferences and engage their clients with products they are likely to use. This is of particular significance in banking where consumers are price-sensitive and likely to move once a better opportunity appears (e.g. better interest rates for ISAs or deposits, etc.). While banking customers may often exhibit a degree of "stickiness" and inertia due to information asymmetries, introducing more transparency and openness in the market (following the introduction of PSD2 and Open Banking in 2018) will encourage movement and change the pace of the competition.

In addition, banks will need to make sure that the quality of external services provided onto their platform is adequate to earn customer's loyalty. Poor quality or unreliable services will damage the reputation of both the bank and the respective FinTech. As platform owners, the banks will need to absorb any transaction costs from the various FinTech interactions and take responsibility for the reliability and security of the service. This is very close to the fundamental responsibilities of platform owners who broker transaction costs and charge a premium for the matching between the demand and supply side. This will give banks a new role of "re-intermediation" which essentially will be to not only facilitate transactions but also provide trust between the two sides of the market – e.g. the FinTechs and end customers – the same way iTunes can guarantee quality of products for those who purchase music from their platform or UBER to those who use transportation services through their app.

When considering platform competition within the banking industry however, we need to take into account possible challengers that may emerge from different markets. Existing platforms that have "overlapping user bases and employ similar

components" (Eisenmann et al., 2011, p.1271) can be notable contenders. In such a scenario, "platform envelopment" strategies could be deployed in order to pursue entry (of a relevant platform provider) into another's market by combining its own platform's functionality with that of the target's that leverages communal user relationships and mutual components. This tactic which we describe here as "platform-as-a-bank" strategy is being observed as predominant platforms, e.g. from the social media space, are moving towards the banking domain taking advantage of the share user relationships and combining their functionalities – for example a messaging service – with banking services such as payments. The effectiveness of such a strategy will be exacerbated as these "outsider" platforms are gradually becoming the go-to platforms for FinTech startups who are keen to provide their services on top of their network. For example, Facebook, managed to incorporate onto its platform peer-to-peer payments between messenger accounts. While they implemented this service only in the US, they also managed to obtain an e-money license in the Republic of Ireland paving the way for messenger payments in Europe.

Prevalent technology companies can be an emerging threat for incumbent financial institutions and FinTechs alike as they enjoy a large user base and often come with a good reputation and trusted brand. Some of these platforms already function at the fringes of the financial services sector. For example, Amazon already operates a payments service and a lending business to SMEs that sell products on its webpage – thus enhancing further cross-side network effects and gaining business. Banks will need to compete with these existing firms and learn how to operate on a platform and ecosystem basis in order to remain competitive. It is possible that such competition will lead to a multi-platform bundle where multiple platforms sit on top of each other (vertical stacking) trying to explore inefficiencies in the existing banking system and extract value from customers. While, it is expected that this will bring certain benefits to customers in the mid-term, it will also rearrange the banking services' value chain and re-distribute market-share and profits in the sector. Depending on the market response, this may have an effect on the banks' pricing strategy and customer premiums.

While platform business models in banking can be an attractive idea it is still questionable whether the context will allow for such an approach to be implemented and have the same effects as in other industries we have observed. Following this, one should consider, what are the unique circumstances and potential challenges and opportunities in the banking sector that may encourage or prohibit the introduction of platforms? In the next section, we summarize some of our findings from field interviews with key industry informants about the possibilities but also barriers to the BaaP proposition and open APIs in banking. Selected theoretical insights from case studies are also introduced to give some grounding to potential responses that could inform decision-making in the sector.

4. Industry insights

At a broad level, the changes open APIs bring to the competitive landscape in banking require a shift in thinking from offering the best products and services in the market to designing an ecosystem with services perhaps unimagined before by a traditional bank, in collaboration with third party payment systems (TPPs), FinTechs,

and other technology and platform providers.

An easy trap that banks may fall into is to approach the implementation of open APIs as another compliance project. As one informant described:

> *"9/10 times, when banks comply with any regulation, they comply with the letter of the law not the principle, because they've gotten in so much trouble in the past for not complying with the letter of the law."*

This approach may prove problematic as the fundamental purpose of the regulation is to change the existing business model - to become much more customer focused – as one informant described, "PSD2 requires reimagining the entire value chain for traditional banking." An important part of rethinking the value offering of banks will be to think of the customer's journey through life with a series of experiences where, before the customer even realizes the need, the bank is there to provide *trusted links to third parties and advice* appropriate for the experience ahead. This shift in thinking is described by one informant as follows:

> *"If you want a loan you go to the bank in a branch or online and get the money into the account. But why am I getting a loan? To buy something. If I am in the process of buying something, why can't I get the loan at the point of which I need the money, or even before, when I'm trying to decide whether to buy or not?"*

While the above example may go beyond the current PSD2 mandate, it is evident that the competition to bring the most seamless platform to support and advise customers through their life journey while integrating with external service and product providers will be a key competitive premise.

Case Study Box 1

Race to become a digital platform leader

Drawing from extant studies on well-known platform leaders such Amazon, Apple, Google, Intel, and Uber, there are some fundamental elements that aspiring or existing platform banks will need to consider when competing in the emerging landscape:

1) **Strong core banking proposition**
   Investing in infrastructure and innovating on the core will help maintain a central position in the ecosystem. This also involves having the right modular architecture and provide easy to use APIs with detailed documentation, community and access.

2) **Effective integration**
   In a platform-based model, integration is key. Think of a physical platform like a shopping mall. The selling point is to create a "one-stop shop" for all customers' shopping needs. This includes being able to search through the services easily but also having comfortable access close to amenities and other value-added services which may be core to the value-added proposition of the mall. In a similar fashion, the more accessible and integrated the services are on a banking platform, the easier it is to use. Maximizing interactions is what will bring competitive advantage and profitability in the mid-long term.

3) **Lower transaction costs**
   Transaction costs have multiple faces and need to be addressed in all sides of the platform. In an open banking setting, the most important would be to provide easy "on-boarding" for FinTechs and reduce the risk of use for the end-customer. Uncertainty on who is liable if things go wrong during a transaction can damage the reputation of the platform and discourage consumers from using the services. Transparent sharing of the risks with FinTechs need to be outlined upfront or as part of the contracting through APIs.

4) **Cultivate all sides of the platform and create vibrant ecosystem**
   Creating a platform vision and culture is essential in order to expand the ecosystem and build reputation. Being proactive to identify and recruit FinTechs that could become complementors is key. The advantages of the platform and technology used will need to be highlighted so that the benefits are clear. In many cases, platform banks will need to advertise FinTechs attached to their platform to increase customer engagement and participation. Reinforcing participation across the two sides will boost further network effects and establish the position of the bank in the market.

Sources: Van Alstyne et al., 2016; Parker et al., 2016; Gawer and Cusumano, 2014.

Companies such as Amazon, Apple, Facebook, and Google, whom customers have grown to trust in many areas of their life from shopping to entertainment or social interaction are already starting to support customers with more and more financial services. So far, banks have been protected from the entry of these technology

players by regulation, as described by an industry analyst:

> *"Why would you go down the path of getting a ridiculously expensive banking license to become something that is cumbersome and painful and hugely regulated. But as the regulation is moving down a path that is fully aligned with their business model, why not? The regulation is the only reason they didn't until now."*

In this new and more crowded race that is made possible by technology and regulation, technology giants may in fact have significant advantages, as described by two bank executives below:

> *"The fear is that Amazon will turn up and say, done it before, or Facebook, or Alipay, or Apple, the fear is that as the playing field is levelled, both the FinTechs and the big players will be losers and the winner will be whoever has delivered the platform functionality and knows how to do the platform and the rest just sits on top. Imagine the type of credit scoring Facebook could generate on the basis of how connected into your community you are."*

> *"Could they become the aggregator? Yes, if they want to! Could they attract FinTechs? Yes! Will they go beyond payments? That is the big question. Tomorrow morning if Amazon announces that they're bringing out a banking service…They have trust, they have scale, they have the technology, and they have the business model to monetise API's. If they do just a tiny little piece of the value chain and we know how much money they have, the customer experience is obviously going to be really good."*

Is it over for banks once these players come into the game then? Not necessarily. Banks have certain competitive advantages over their competitors within and outside the financial services sector. Firstly, regulatory compliance (such as regulatory reporting, anti-money laundering, and "know-your-customer", etc.) is often a complex and difficult task that banks know how to do well and other firms are not likely to want to compete on. This is mostly because it would be expensive to build the infrastructure (e.g. establish processes, develop systems, cultivate relationships with regulators, etc.) and run such services for a small portion of financial products.

An additional advantage of banks over other platforms and FinTechs is the trust that the customers have in them in handling money securely. An industry analyst describes this advantage as one that *"banks are seen still as the safest and most trusted place for people's money to be*". In this context, he adds, *"getting a third party established to take some of that market away, will be difficult. It won't happen overnight. But millennials and gen Y's are much more open to accepting the digital revolution and third parties offering services."*

Whether it will take a couple of years or a decade, however, this development is overpowering and its consequences will come down to "who will get there first", i.e. who will establish the largest and most seamless platform, fulfilling a large variety of customers' needs through collaboration with complementors. In this race, a critical point for banks to think about as they consider building an open platform is to *learn how to manage a set of partners.* While banks are familiar with APIs, they are much less familiar with working with third parties, as described by one informant:

"API's have been around in the digital world for a very long time, but they existed in a closed system. It will be substantial work to open them up because the systems that banks have installed were never designed or conceived with this in mind."

Let us then look at what extant research tells us about managing a set of partners on a platform.

Case Study Box 2

Managing an Ecosystem of Complementors

In his book "*The Wide Lens: What Successful Innovators See that Others Miss",* Ron Adner suggests that success requires an assessment of interdependence among all partners, and clear strategies to manage them. In particular, it is critical to pay attention the role of the different players, their importance for the ecosystem and thus their power, and the interaction effects between them. In particular, research gives us the following insights about managing an ecosystem:

1. **Think about who your "complementors" are.** You should cooperate with them to make the pie as large as possible for everyone.

2. **At the same, create a competitive environment for them.** Competition among "complementors" increases quality and innovation and reduces cost.

3. **Ensure buy-in of all critical partners.** Sometimes this may entail shifting value from consumers to partners. Amazon did this by launching the Kindle e-reader as an extremely closed device, reducing value for end users but safeguarding the participation of publishers, whose fear of the threat of piracy was the deal breaker in every prior e-reader effort.

4. **Finally, ensuring your collaborators are ready before you launch your product matters greatly.** Rushing your innovation to market before your co-innovators are ready can result in a costly delay at the starting line. Early HDTV manufacturers launched their products before HDTV programming arrived. Then, while they waited for complements to catch up, the environment changed as new formats and new rivals emerged. An innovation that was once characterised as the biggest market opportunity since colour TV is now competing for consumer attention in a crowded market space.

Adner warns that the most common mistake that managers make is to plan out the full ecosystem, pick their position within it, and act with all haste to create and defend their role in delivering an integrated product or service to the end customer. But they tend to overlook the process and the order through which their ecosystem will emerge over time. Creating strategy that explicitly accounts for the risks, delays and challenges that are inherent in collaborative networks is the key to succeeding in ecosystems.

Sources: Adner, 2012; Ozcan and Eisenhardt, 2009.

Creating an open platform where FinTechs and other providers become the bank's partners, much like the application providers on Apple or Android's Application Stores, brings a set of issues that may be challenging to deal with.

Challenge 1: Speed versus Security

The FinTechs that we interviewed as part of the study all voiced concerns about the pace at which banks have been working with them so far. In particular, questions about how quickly the bank can approve their product and bring them to market were frequently mentioned. One of them described:

> "*We need the banks to get to the consumer, and the banks need us, we are the small guys who can innovate, but even if they realise that, how do you move a giant at the same speed as yourself?"*

Our study shows that the origin of these concerns may be more than the typical difference in agility between start-ups and established firms. Banks' longstanding and hard-earned reputation for providing full security on all financial services may also play a role. This orientation towards perfecting the processes to establish full security may make it difficult for banks to work with FinTechs in terms of speed and experimentation. An informant described this dilemma as follows:

> *"I'm absolutely sure we will have a case somewhere, also in our portfolio, where something doesn't all work right and we'll have to deal with that. That was one of the discussions we had with compliance, how do we manage reputation in that case?"*

Another informant described how, even after rigorous testing, their FinTech partner's algorithm crashed as soon as real data came in, suggesting that a certain level of risk is unavoidable no matter what.

Case Study Box 3

How Security and Customer Ownership Issues Delayed Mobile Payments for 15 Years

The mobile payment industry is a perfect example of titans from different industries clashing over how to deliver a new concept. It is often the case that firms from distinct industries struggle to reach an agreement when launching a new market. This is due to their history of dominance in their own industry and lack of joint collaboration experience. In the case of mobile payments, cooperation was critical between the giants of the banking industry on the one hand and the network operators on the other. However, when they came to the negotiation table, they struggled to agree on two major issues:

1. **Who owns the customer?**
   The first contentious issue was who would "own" the end-customer. Both types of firms were used to being the point of contact with their customers, monitoring and affecting customer behaviour directly. Both sides unwilling to "share their customer", their discussions continued over 10 years and the disagreement was not resolved.

2. **Who deals with security?**
   Disagreements also emerged between banks and mobile operators about security. While mobile operators preferred to use their existing security platform for Near Field Communication (NFC) transactions, banks were used to security modules with a higher level of certification. During the study, many informants stated that part of banks' resistance was "psychological", i.e., they wanted to remain in control of the security issues. A mobile executive commented: "*Banks like to have control and thus face emotional problems putting applications on the neck of a telco.*" An analyst added: "*Banks have a hard time letting go. They are willing to settle for solutions where there is a separate security element in the handsets, but the governance of that security element is a big issue for them.*"

Overall, the inability of banks and mobile network providers to reach an agreement led to a weak compromise on how the mobile market would function, with many unresolved issues in how it would be managed. This creates a vicious cycle where other players hold off investments in the necessary market infrastructure: implementing point of sale devices, rolling out payment technology enabled phones. When the infrastructure falls behind, the disagreeing parties in turn lose any incentive to work on an agreement because the market is not taking off. The result: despite the mobile payments technology being readily available since 2000 and despite the strong demand for it, the market has been incredibly slow to materialise. Finally, Apple took the lion's share in the market after launching the service in 2015. Today, a big share of mobile payment services and digital wallets are neither a mobile operator service, nor a bank service: the brand visible to the consumer is Apple, Google or Samsung.

Source: Ozcan and Santos, 2015.

Challenge 2: Owning the Customer

A second issue that may be challenging for banks in this world that is both more competitive and more collaborative at the same time is to rethink their assumption that they "own the customer." Open APIs often lead to modularity in terms of services which will make it difficult to claim a customer. Sharing customer data makes this more challenging since it brings down the "barriers of entry" and allows competitors (especially smaller banks) to access customer intelligence and offer competitive products in order to gain "customer share".

A critical part of the mindshift that banks need to make from owning the customer to sharing the customer is in their work with partners. In the process of building an ecosystem, banks will see different layers on top of their platform, which will bring the question of "whose name will be on the shop window?", like it happened in the case of mobile payments discussed above. An informant explains the importance of branding the entire relationship as a service of the bank as follows:

> *"Branding is a big challenge. If I'm interacting with those 2 API's on the platform 90% of the time and interacting with my bank 10 times less than I was before, getting frequent reinforcement of the relationship that I have with my bank is a lot harder, unless the bank logo stays in front of those API's. Volume things, and emotionally significant things, like got money to buy my dream house or an insurance claim, which reinforce the brand are the key. If they're gone, your customer relationship hurts."*

While it is understandable for banks to want to stay visible to their customers at all times like before, we suggest that the issue does not necessarily need to be black or white. Not only depending on the type of API, but also on the target customer, branding and visibility of third parties on the platform can be negotiated. An informant that has faced this issue reflects as follows:

> "*I could envision it wherever we can either encapsulate for a specific target group, we say for that target group it makes sense to reconsider. Or when it's a brand or when it's actually a topic that we don't have competence on, that is perfectly fine using their brand cause no-one believes us to be good in that."*

Being flexible in considering when to keep a unified front versus co-brand with third parties will be a crucial mindshift for banks in the future. Showing this flexibility is an important signal for innovative FinTechs and smaller players that fear not being able to build brand equity if their services are "swallowed" by the bigger bank as part of a broader offering.

Challenge 3: Buy, Build, or Collaborate?

As apparent above, a critical question that will arise for banks as they face these challenges is "what to provide in-house" or acquire versus offer through collaboration on a platform basis. Given their history of maintaining closed secure systems, one way to handle this dilemma may be to go the acquisition route, either for security or visibility reasons explained above. While acquiring third parties that are critical for the platform may solve the problem, this may be an expensive "quick-fix" that has drawbacks in the long-term. An informant explains this very effectively:

> *"You can build or buy a "Monzo". The advantage of building is that you change your culture and personnel. The disadvantage of building is that you start from where you are. If you start from where you are you assume that you have the right to survive, which you don't. Whereas if you start from the consumer, you might end up with something that looks a lot like you or nothing like you."*

In a world where a large variety of services will be provided as part of a platform, banks will indeed need to reconsider their competitive advantage compared to the numerous players that are specialised on various technologies and data-related services. Several bank executives mentioned how, as they immerse themselves in the FinTech world, they are faced with the question of whether to only collaborate for services that they do not currently provide or to reconsider their whole range of products and services. One executive facing this dilemma described how difficult it is to convince her entire bank of the need to reconsider their entire portfolio:

> *"Yes, we want to collaborate with Fin Techs where they provide additional services that we don't do ourselves today and that we could sell for our clients, tick, easy. But what if we could collaborate with a Fin Tech that basically offers banking services but does that better than we do, with a better customer experience or cheaper or whatever? That's just happening at the moment and none of us has experienced it before. Collaborating for something that we don't do is a lot easier to explain than popping up and saying guys, now we work together with XYZ because we think their risk model is better than ours and let's just give the lead to them, generate revenue by the lead generation and not selling credits or loans on our own anymore, I'm pretty sure many of our supervisors will not go for that now."*

While a reconsideration of their entire portfolio is not an easy task for banks, both operationally and in regard to the organizational culture, it may prove essential for sustaining their competitive advantage. We suggest that going back to the drawing board to redesign the company's offering by asking: "What does the customer care about? How much of that is our core competence? Who can we cooperate with to offer the rest?" will help banks do some necessary restructuring to be "leaner and meaner". In that context, if a bank decides to "build" a new solution or acquire an un-tested FinTech they may be "stuck" with a non-performing asset if it is not adopted by customers. Alternatively, using a platform as the vehicle to try value propositions with customers and subsequently target if in due course they are considered "core" might be a good way out of the upfront "buy or build" dilemma.

5. Conclusion

It is clear that regulatory changes taking effect in the banking sector in the near future will require the traditional players to change their mind-set from a closed model to an open but secure one. A bank executive describes this challenge as follows:

> "*Most banks have been in the past very closed systems. They have developed everything themselves, completely stupidly, that has been something that has never been questioned. So how much do we want to open up and where and how do we open up, these are all brand new questions for us*."

In practical terms, this will mean learning how to collaborate, how to share the customer with platform partners, and to restructure internally to become more agile.

A lot of the regulation is still at the hand waving stage, with many elements still not standardised across Europe, and potentially taking much longer than foreseen due to the UK's departure from the European Union. This may motivate large players to adopt a "wait and see" attitude, as described by one informant below:

> *"There are ways to survive and become profitable again but they may not look like your organisation now. Where do you begin? Everyone is beginning with the regulation, what do I have to do?*"

We strongly believe that the time to start the change process is now. In addition to already considering how to tackle the challenges described above, playing an active role in the reduction of the uncertainties in the larger institutional environment is critical. Putting on a strategy hat rather than a compliance one and taking an active role in the reconfiguration of the market space will surely have its rewards. Those who move early to establish an attractive platform will obtain a customer base that is increasingly unwilling to switch to competitors as more and more third party developers offer services as part of the platform. And in turn, their growing customer base will attract even more developers, turning this virtuous cycle of growth further.

Achieving this is not easy. Rather than being focused and concerned about their own profitability around open APIs, banks need to be asking how firms and counterparties attached to their platform will benefit from the interaction. Short term plans to profit from open APIs may prohibit the development of an entire ecosystem which can be more profitable in the near future. Amazon spent years and billions in investments to grow their platform and increase their capacity to accommodate more products and services before making an annual net profit for the first time in 2015. For long-term benefits, banks should not see open APIs as a burden but as an opportunity to enhance connectivity with the customer and the rest of the industry.

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Dr. Markos Zachariadis, Assistant Professor of Management & Information Systems, Warwick Business School, University of Warwick

Markos Zachariadis is Assistant Professor of Information Systems & Management at Warwick Business School and a FinTech Research Fellow at the Cambridge Centre for Digital Innovation (CDI), University of Cambridge. Markos' research sits at the cross section of economics of digital innovation, financial technology studies, and network economics, and has studied extensively the economic impact of ICT adoption on bank performance, the diffusion of payment networks, and the role of data & standards in payment infrastructures (SWIFT) and financial markets (LEI) among other things. His research has been published in top academic journals such as *MIS Quarterly, Research Policy,* and *Business History* and has been awarded the NET Institute Award (NYU Stern Business School) for his study on the economics of payment networks, and the SWIFT Institute Award for his research on Open APIs and Digital Transformation in Banking. He is also co-author of *The Society for Worldwide Interbank Financial Telecommunication (SWIFT): Cooperative governance for network innovation, standards, and community* (London: Routledge 2014).

Markos has been invited to present his findings to various international conferences and organizations (SIBOS, Bank of England, Microsoft, SWIFT, IBM, Financial Times, EY, Bank of Cyprus, etc.) and organized an international conference at Warwick Business School on "PayTech: Technologies of Exchange in a Digital Economy" funded by Gates Foundation, MasterCard and Capco. Also, he has shared his work and perspectives with IBTimes, Bloomberg, Fortune Magazine, BBC Radio, CNN, SkyNews, USA Today, ITV News, The Conversation, among many other media outlets.

Prior to joining Warwick Business School, Dr. Zachariadis was a Research Associate at the University of Cambridge Judge Business School, a Visiting Scholar at London Business School and a Researcher at the Centre for Economic Performance, LSE. He studied economics at the University of Patras, Department of Economics and holds an MSc and PhD from the London School of Economics, Department of Management.

You can follow Markos on Twitter @MarkosZach and on LinkedIn.

Dr. Pinar Ozcan, Associate Professor of Strategy & International Business, Warwick Business School, University of Warwick

Dr Pinar Ozcan is Associate Professor of Strategy and International Business at the University of Warwick. Dr. Ozcan completed her Ph.D. at the Stanford Technology Ventures Program (STVP) at the Stanford University Management Science and Engineering Department, and also holds a Master of Science and dual Bachelor degrees from Stanford. At Stanford, she worked with Professor Kathleen Eisenhardt, one of the leading scholars in multiple case inductive research methods. At Stanford, Dr. Ozcan also directed the AEA Stanford Summer Executive Institute for the high-tech industry,

organized the Stanford Entrepreneurship Thought Leaders Seminar for young entrepreneurs, and helped create the STVP Entrepreneurship Educators Project for entrepreneurship educators worldwide.

Over the years, Dr. Ozcan has built a research agenda studying the emergence of new technologies and markets with studies in mobile technologies (e.g. gaming, payments) as well as broadcasting, social media and sharing economy with publications at top academic journals (e.g. Academy of Management Journal, Strategic Management Journal). Her work in these areas has received the Excellence in Research Award at IESE Business School, the EFMD Best Teaching Case Award, the IDEA Entrepreneurship Thought Leader Award, and a Best Paper Nomination at the Academy of Management Journal.