6-18-2022

THE CARROT AND THE STICK: OPEN BANKING PLATFORM GOVERNANCE IN THE SHADOW OF PSD2

Claire Ingram Bogusz
Department of Informatics and Media, claire.ingrambogusz@im.uu.se

Shruti Kashyap
Department of Business Administration, shruti.kashyap@fek.uu.se

THE CARROT AND THE STICK: OPEN BANKING PLATFORM GOVERNANCE IN THE SHADOW OF PSD2

Research Paper

Claire Ingram Bogusz, Department of Informatics and Media, Uppsala University and House of Innovation, Stockholm School of Innovation, claire.ingrambogusz@im.uu.se

Shruti Kashyap, Department of Business Studies, Uppsala University, shruti.kashyap@fek.uu.se

Abstract

This paper employs a qualitative analytical approach to address the question of how incumbents incorporate risk into their platform strategy, and how this in turn influences their approach to platform governance. Through an analysis of legislative and policy documents on the formulation and implementation of PSD2 in Sweden and the EU, 24 semi-structured interviews with experts and organisational representatives in the Swedish banking sector, and literature from the fields of strategic innovation and financial sector governance, we conduct the grounded analytical development of a model linking risk assessment to platform governance among incumbent banks. Our model suggests an iterative three-stage process, involving translation, mobilisation, and incorporation as platform owners at banks try to balance openness and perceived platform risks.

We identify a conflation of *access openness* and *resource openness*: platform owners decide resource openness *ex ante*, as part of their overarching strategy around what kind of platform to have, and then once they have the platform in place make decisions about *platform access* on a case-by-case basis, based on their risk assessments.

Keywords: platform governance, risk, open banking, PSD2

1 Introduction

A central question in platform governance is how to manage the tension between—and risks and rewards implicit in—platform openness and control (Boudreau, 2010; Karhu et al., 2018). Extant research indicates that endogenous ideas around value creation and capture strongly influence how platform owners achieve this balance (Ceccagnoli et al., 2012; Huber et al., 2017; Rietveld et al., 2020). However, it may also be the case that exogenous pressures, in this case in the form of new legislation, also affect openness—control decisions, particularly when it comes to identifying risks. This longitudinal, qualitative study investigates how highly regulated banking platforms respond to external pressures, namely through regulation in the form of the EU Revised Payment Services Directive (PSD2). It reveals that platform owners do not base their decisions about openness and control primarily on strategic concerns. Rather, risk perceptions play an important and reflexive role in informing platform governance. Not only do risk perceptions impact platform governance decisions, but these governance decisions in turn allowed platform owners to manage their perceived risks.

Platform ecosystems are characteristically comprised of an architecture that includes the platform itself (e.g., Tiwana, 2015), and a number of stakeholders. These stakeholders typically build apps – or complements – that offer additional services or functionalities on top of the platform (e.g., Jacobides et al., 2018). In the EU market for payment services, PSD2, which came into force in 2018, was

promulgated to counter pre-existing difficulties "for payment service providers to launch innovative, safe and easy-to-use digital payment services and to provide consumers and retailers with effective, convenient and secure payment methods" (PSD2, para 4).

Implicit in PSD2 are two acknowledgements: first, that platforms consist of more stakeholders than just complementors, platforms, and users; and second, that risks associated with platform governance may relate not only to the organisation behind the platform but also to systemic risks that extend beyond the platform and into the ecosystem within which the platform and its stakeholders exist. (Hu et al. 2012). In this context, building a better understanding of the risk perceptions of platform owners and how such perceptions affect platform governance is not only of empirical interest, but also allows us to better understand platform ecosystems in highly regulated markets such as banking and payment services (e.g., Hu et al., 2012). Additionally, such an inquiry provides a more specific understanding of how platform leaders engage in the formation of platform governance strategies under conditions of uncertainty (Dattée et al., 2018; De Reuver et al., 2018).

This paper undertakes an exploratory study of how changing perceptions of risk resulting from the implementation of PSD2 affects platform governance, from the perspective of platform owners. PSD2 has largely obliged banks to build boundary resources that facilitate and enable transaction and data-centric complementary services (e.g., Ellis et al., 2021). The resulting phenomenon is widely known as "open banking", and relies heavily on platform ecosystem models. For many banks with no prior experience in platform ecosystem models, regulatory compliance with PSD2 is accompanied by a high degree of uncertainty regarding the risks involved such arrangements. On the one hand, as platform owners, banks are legally obliged to "open up" to other market actors in order to achieve regulatory compliance with PSD2. On the other hand, banks retain much of the legal—and moral—responsibility for their users' data and money (Wolters & Jacobs, 2019). As platform owners, banks are thus tasked not only with balancing the risks of PSD2 compliance ("opening up") against their responsibilities to their users, but also with the unknown risks and uncertainties that accompany the new territory and "poor visibility" (Dattée et al., 2018) of platform ecosystems.

Focusing on the regulatory impact of PSD2 on incumbent bank-owned open banking platforms in Sweden, the study adopts a qualitative analytical case study approach inspired by Yin (2009) that examines how platform owners use platform governance, both on and off the platform, to understand and respond to perceived risk. This is done in an effort to answer the question:

How do platform owners accommodate risk considerations in their platform governance, specifically through their decisions regarding resource access and platform access?

In addition to primary data through interviews and documents, we draw on platform strategy and governance literature, and extant literature on risk from both IS and corporate governance to develop a model of how various risk perceptions influence platform governance, focusing particularly on decisions around the openness of the platform along the key dimensions of resource openness and access openness. Our findings provide a direct process view into platform development and risk as result of the implementation of PSD2, and serve to deepen current understandings of platform architecture and governance literature.

2 Theoretical Background: Platform architecture and governance

Platforms are increasingly harnessed to create new business models, both for incumbents (e.g., Volvo,(Svahn et al., 2017), and for relative newcomers (e.g., Uber, Netflix, (Yoo et al., 2010). These platforms are part of a larger ecosystem comprised of both the platform itself (defined by (Tiwana, 2018) as an extensible digital code base that offers standardised interfaces and functionalities), and additional complements provided by other actors in the ecosystem. These complements may comprise of either physical (e.g., a new device) or digital code (e.g., an iPhone application, or app) that can add new interfaces, services or functionalities for end users (De Reuver et al., 2018).

A crucial element of platform governance is orchestrating platform access for other stakeholders. Extant research into ecosystem-wide governance has emphasised the unavoidable tension between openness and control (Boudreau, 2010). While openness promotes innovation, control allows a platform owner to extract value and give users a more integrated experience (Boudreau, 2010; Boudreau & Hagiu, 2009). From the platform owner's perspective, there are two distinct steps in accessing the platform. The first is whether the complement obtains access to the platform and its functionalities at all, or what is known as *access openness.* Once a complement has obtained access, the platform owner can then also decide which functionalities and data to make available, or what is known as *resource openness* (Boudreau, 2010; Karhu et al., 2018).

Questions around openness and control form the core of digital platform governance. Established platform strategy literature points out that the more open a platform is to complementors, the more innovation the platform is likely to see, and the faster this is likely to occur (Boudreau, 2010). At the same time, platforms also exercise control for reasons of influencing user experience (Eaton et al., 2015), and to control the pace of the innovation (Ghazawneh & Henfridsson, 2013). These areas of governance are standardised across the platform through industry rules and practices (Huber et al., 2017; Rolland & Monteiro, 2002) that stipulate a standard approach to *access openness* and *resource openness* (Boudreau, 2010; Karhu et al., 2018). In heavily regulated industries and markets, regulatory compliance and associated risks may further present additional pressures and uncertainties for platform owners.

Platform governance is informed by the information available to the platform owner (e.g., Boudreau & Hagiu, 2009). However, platform owners rarely know *ex ante* what their governance choices around platform openness may be. Instead, governance evolves over time in response to technology changes (Rietveld et al., 2020) and changes in expectations among stakeholders. For instance, if the platform fails to offer capabilities that complement developers and/or the user base see as useful, they may "fork" it (Karhu et al., 2018) if it is an open source platform, or "jailbreak" it if it is not (Eaton et al., 2015).

Extant research has focused on the importance of boundary resources for enforcing this governance process. These include APIs and app stores (Eaton et al., 2015), licences (West, 2003), and developer environments (Karhu et al., 2018). However, these governance decisions have been treated as existing *ex ante* to the governance processes (Huber et al., 2017; O'Mahony & Karp, 2020; Rietveld et al., 2020) rather than formed by and through the governance process. While risks are mentioned in passing in these literatures, they have not to our knowledge been the subject of closer examination.

2.1 Risk perceptions

The concept of risk in platform governance literatures (Huber et al., 2017; Wei et al., 2021) is understood as something that is objective and easily managed—not unlike a cost. However, the more subjective study of perceived risk, and how that can be incorporated into the development of a platform strategy, and its implications for architectural platform governance, remains unclear.

In building risk understanding for the current inquiry, we draw on the rich body of research on risk perceptions that exists in management and corporate governance literature. In line with these research streams, we define risk as the effect of uncertainty on achieving some objective (Mikes 2009, 2011). These understandings and perceptions of risk—and thus how an organisation responds to recognized risks — evolve over time and in response to new information (Ferreira and Laux 2007; Mikes 2009, 2011). Importantly, risk perceptions are often subjective (Mikes 2011), and rest on ongoing quantitative and qualitative assumptions and analyses (Mikes 2009, Mikes 2011, Aven 2011).

In the shifting landscape of regulatory evolution, financial organisations such as banks are being pushed to rapidly develop more nuanced risk understandings and perceptions, even as newly and untested regulations come into play. From both compliance and competition perspectives, banks are increasingly focused on organisation-specific risks such as counterparty credit risk and operational risk (Arora et al., 2012; di Renzo et al., 2007). Collectively, such organisation-specific risk factors and the risk interconnections between banks and other actors in the financial marketplace not only impact the

soundness and competitiveness of banks themselves, but also contribute to systemic risk – that is, the risks posed to the stability and soundness of the financial system as a whole (Tarashev et al., 2010).

With regard to risk perceptions on part of banks, there are two important findings relevant for this paper. First, the degree of risk that an organisation perceives itself to face in its external environment will impact not only intra-organisational dynamics such as culture and strategy, but also influence organisational competitiveness and performance in the marketplace (Lim, 1995; Pablo, 1999). In quantitative empirical studies, the effects of such risk perceptions are usually captured through controls for size and industry effects; in theory-building papers of a qualitative nature however, the dynamics of how risk perceptions impact the strategic and operational activities within and between firms continues to be of interest (Crawford et al., 2017; Giovannoni et al., 2016). Second, the risk perceptions of managers and decision-makers within regulated industry sectors such as banking and finance organisations are heavily dependent on information regarding the controllability of identified risk factors and the probability of these risks manifesting (Kaplan et al., 2020; Kaplan & Mikes, 2016).

For platform owners, the main focus of risk management in platform governance may be recognized as a bid to establish control over outcomes in line with organisational and business aims, through a reliance on known and established information, standards, criteria, and routines as relevant to the situation at hand (Kaplan et al., 2020; Pablo, 1999). The more scant or ambiguous such information is however, the more uncontrollable the risk outcome becomes. Importantly, in new or novel situations such as open banking, unforeseen iatrogenic or novel risks may emerge (Berglund, 2007; Kaplan et al., 2020). Such risks may not be easily accounted for before they occur; however, as Kaplan et al. (2020) point out, indications of such risks may emerge through anomalies within either intra-organisational or inter-organisational processes of interaction.

The above conceptual understandings link to the long and diverse history of risk, and risk perception as studied in IS research within two streams. The first of these comprises of studies in which IT is used to manage risk, for instance through the use of security systems and similar to ameliorate or mitigate risk (e.g., Ren & Dewan, 2015); and the second stream encompasses studies of how to manage risks during, or resulting from, the implementation of an IT system (e.g., Scott & Vessey, 2002). Within both streams, it is understood that although new technologies have often reduced risks by addressing and mitigating inefficiencies (Tufano, 2003), they may also introduce new organisation-specific and systemic risks. Any resultant anomalies may often be difficult to detect, based in large part upon the biases and limitations of human actors as well as the technological systems within which they operate (Kaplan et al., 2020; Kaplan & Mikes, 2016). Thus, how risks, particularly iatrogenic or novel risks are perceived, is a largely emergent process – one on which little research exists today in any field. For heavily regulated and technologically driven industries such as financial services where the downsides of risk realization are potentially catastrophic at a broader economic level, building an appropriately holistic understanding of risk perceptions is relevant and timely.

3 Study Design

3.1 Case background

The EU financial sector ecosystem is defined by high levels of innovation and growth, coupled with correspondingly high levels of regulatory oversight. Within the heavily regulated market for financial services, incumbent banks are faced with the task of achieving often complex measures of regulatory compliance whilst at the same time pursuing successful strategic innovation in their market offerings. This is especially true in the context of digital platform innovation and strategy, where the activities of incumbent banks are heavily influenced not only by regulation and market demands but also by the rapidly shifting ecosystem of new market entrants with whom these banks must both cooperate and compete. Recent regulation such as the PSD2 has had a significant impact on increasing the presence of third-party service providers in the financial sector, with significant influences on competition as well as risk in the marketplace for financial services.

Well-functioning market ecosystems in digital platforms allow firms to create value in a synergistic manner that exceeds what any single firm could have created alone. The benefits to incumbent banks, who are usually platform leaders and owners in such ecosystems, have significant positive potential. At the same time, strategic approaches towards the innovation and development of digital platforms also includes the negative and costly potential for failure – especially in the context of increased competition by new market entrants and heightened regulatory compliance demands. Both of these factors introduce additional dependencies into the considerations that incumbent banks must attend to, given that the success of any platform strategy necessarily and reflexively depends not only on the banks´ own efforts and performance but also on the efforts and performance of these other (new) actors within the still-emerging ecosystem for digital platforms in financial services.

3.2 Data and methods

The initial aim of this research was to identify how regulation, PSD2 in particular, affects platform governance. After the first initial interviews, we realised that the novel way in which this piece of legislation was affecting platform governance was in how risk was perceived, and which sources of risk were relevant for platform owners.

The lack of existing research addressing the interplay between risk and platform governance, especially considering elements of platform and resource access, motivated our exploratory qualitative approach (Miles & Huberman, 1994). Focusing on the regulatory impact of PSD2 on Swedish platform owners, the study engages in a qualitative analytical case study approach inspired by Yin (2009). It uses a triangulated data set of twenty-four (24) interviews with platform owners and developers (14 interviews) compiled over more than a year, industry agencies across FinTech and banking (3 interviews), FinTech entrepreneurs (5 interviews), and regulatory authorities (2 interviews). These interviews were between 30 and 90 minutes long, conducted by both authors and transcribed before coding.

The interviews are complemented by approximately 45 pages of legislative and policy documents, public reports, and newsletters pertaining to PSD2. These include Open Banking newsletters for one of the banks (5 newsletters over the course of the year), and reports on Open banking for all four banks. The data is further triangulated with three one-hour workshops conducted with FinTech entrepreneurs. These are summarised in Table 1.

Having identified perceived risks as being of interest, we fine-tuned our interview guide and delved deeper into this topic. We followed a process of iterative coding of both the interview transcriptions and the archival material, looking first for empirical themes in our data. We then re-coded these themes and concepts to come up with second order themes, before identifying top-level processes wherein risk perception affects platform governance activities and outcomes (Gioia et al., 2012).

Data source	Data collected	Topics covered
Four largest Swedish banks	13 interviews	Identifying and managing risks highlighted by PSD2, learning to collaborate with FinTech firms, adjusting internal processes and legacy systems
FinTech branch organisation	1 interview	Points of resistance when trying to access bank platforms, emerging platform standards (and the lack thereof)
Banking industry association	2 interviews	
Regulatory authority	2 interviews	Different interpretations of PSD2, systemic risks, micro-prudential supervision as relevant to banks' internal control and governance
Infrastructure provider	1 interview	Emerging platform standards (and the lack thereof)
Further data, including newsletters and reports	Approx. 45 pages	Professed platform strategy from banks (to triangulate against interviews from both banks and FinTech actors)
Workshops with FinTech entrepreneurs	3 x 1-hour	Collaborations between banks and FinTech actors, areas of success and failure, perceived bank anti-competitiveness, difficulties arising from non-harmonious interpretation of PSD2 regulations across EU countries
FinTech entrepreneur interviews	5 interviews	

Table 1: Summary of data collected

Both authors coded the data individually during the empirical coding phase. After coding each interview, in line with Miles and Huberman's (1994) recommendations around drafting theoretical memos, we jointly detailed the theoretical insights we gained from each interview. From the second-level coding phase, the authors coded the interviews jointly. We followed established praxis to establish the reliability and validity of our constructs and case findings (Onwuegbuzie and Leech 2007). We discussed both similarities and differences as they emerged in our individual processes during regular meetings and workshops throughout the coding and subsequent analysis process. As the interviews were conducted longitudinally, we also had the opportunity to refine and check our emergent conceptual understandings against the responses and observations offered to us by our interviewees.

4 Findings: Regulated Platforms as a new risk milieu

That a platform's governance strategy will be forced to change in line with new regulations is largely unsurprising. In the same vein as post-crisis prudential regulation, PSD2 seeks to balance the benefits of openness through financial innovation and competition against the very necessary prudential focus of risk control, especially by incumbent banks. What emerged through our data collection was an iterative process by which organisations linked risk-focused regulatory demands to platform development measures that balanced risk with functionality. These iterative processes, and the codes that helped us identify them, are summarised in Table 2 above and discussed further in what follows.

Activities to accommodate risks within platform governance	**Mid-level processes**	**Risk incorporation into platform governance**
Placing limitations on API/data access based on compliance concerns	From regulatory logic to platform development logic	Translation
Retooling existing APIs to align with PSD2		
Explaining to lawyers what is and is not possible on/with a platform	From platform development logic to regulatory logic	
Retooling existing APIs to align with PSD2		
Signing partnership agreements when FinTech actors providing services to bank customer	From supplier to partner	
Lack of control over what FinTechs do with customer data/payments once access granted		
Risk quantification	Strategic reorientation	Mobilisation
Budgeting for API development		
Persuading actors internally that this is competitive advantage, not a hygiene factor		
Standardising of data structuring	Tailoring the platform	
Building new functionality (e.g., consent management)		
Grooming of nascent fintech firms	Incubation	Incorporation
Learning about innovations on the market through in-house incubator		
Relaxing control over software development	Loss of control	
Allowing smaller players to sell services to their customers		
Learning to share (e.g., data sharing, revenue sharing)		
Own services competing with FinTechs on bank's platform	Coopetition	
Partnerships with unfamiliar actors and actor types (e.g., municipalities)	Acclimatisation	
Matching fintech risks with areas in bank that understand those risks		

Table 2: Summary of coding to understand the interplay between risk and platform governance

4.1 Translation

When faced with new regulatory demands, the first thing that the banks in our case did was translate the requirements of the regulations into new language that met technical and organisational requirements. Although PSD2 makes clear that making platforms too open could create systemic risks, in practice the

banks did not evaluate systemic risk in its own right, but rather behaved as though following the requirements of the regulations and their requirements would "cover their backs".

This translation within the banks meant that the banks had to interpret and render regulatory requirements into platform functionalities that they could control, and simultaneously compare existing platform functionalities against the bar set by regulations.

Here, the banks considered these risks in two ways. First, they considered what it was that the regulations required that they give FinTech entrepreneurs access to (*resource access*). And second, they considered what conditions these actors would need to fulfill in order to gain access to the platform at all (*platform access*).

Although PSD2 talks specifically about data (*resource access*), we identified that the banks exhibited a need for a more nuanced understanding of which data were involved, and which modes of access made sense. Did this just include data already structured and available in a bank-held database—through an API—for instance? This was the simplest for the the banks, but they were also mindful that FinTechs had previously wanted to be able to scrape and access data that banks had not previously collected and structured—screen scraping, for instance, detailed information about customer transactions.

Interestingly, some banks actually saw PSD2 as legitimating a more restrictive policy when it came to data access:

> *"We went live with our first open banking partnership 2017 with [partner], with our own API, very similar to the PSD2 requirements. As they stand now, so from that perspective, you know, we were on that ball… [but today] you have the scraping aspect [scraping data from user screens] where you have fintechs, accessing [bank] customer data in our channels without our permission… what PSD2 does is allows us to restrict that access totally to API's. So, so I think most banks are quite happy, that PSD2 came in to start regulate this access to data."* (Swedish bank, interview)

Another large shift lay in identifying who should gain access to their platform at all (*platform access*). In order to decide who, and why, some actors would be given access while others would not, the banks turned to: 1) putting together standardised service agreeements with clear terms, which would allow them considerable control over FinTech actors once they began to use the bank APIs; and 2) began to build new relationships with FinTech actors in order to better allocate responsibility—and thus organisational risk—in a reasonable way. Sometimes this perception of organisational risk led banks to limit platform access completely, even where problems had not yet occurred:

> *"Banks are always trying to point at the fintechs, [saying] they are the big risk. But we haven't seen any scandals within our companies"* (FinTech branch organisation, interview)

At the same time, banks found that they had to form in-organisation capabilities to be able to control and mitigate the new technical risks that resulted from PSD2:

> *"I think if banks would choose they would probably choose the same kind of service but from a larger suppliers. For example, if IBM built the best Software as a Service, we would probably get that [instead of allowing a FinTech to provide the service] because we don't want that, that that, you know, risk. So, when we look at FinTech partnerships, that is several aspects that one is the risk factors, which requires another level of of control and risk management."* (Swedish bank, interview)

These early understandings of how, and to whom, responsibility should be allocated (captured by platform access), and how and through what means risk should be controlled and mitigated (captured in resource access) fed into an initial picture of the platform under development. These initial understandings were then built upon through other organisational processes that refined these understandings, specifically *mobilisation* and *incorporation*.

4.2 Mobilisation

In line with translating regulatory requirements and demands into organisational processes and platform functionality, the next step that banks took internally was to engage in a strategic realignment of risk understandings and assessments within the context of refining platform development efforts. Here, they worked iteratively with already identified translations of what PSD2 would mean for their assessments of risk through *resource access* and responsibility through *platform access*.

One trend that emerged was the increasing movement towards commensurability of risk understandings and approaches (the motivation for *resource access* limitations) at not only organisational but also industry levels. One of the areas where this surfaced was in the design approach being taken towards payment system infrastructures at an industry level, where granular understandings of risk were shifting towards centralization and harmonization amongst market actors and regulators. The main aim of this development, driven in large part by PSD2, appeared to serve the dual goals of risk identification and market integrity:

> *"Back in the days, as far back as 1959, many of the European banks started transferring funds electronically. That also happened here in Sweden, where they built the bankgiro centrally to function as the National Clearinghouse. As in the other European countries, Sweden also developed local formats for the transfers of the funds and custom made it integration solutions. Over the last 20 years, the world has transitioned from those legacy systems – those older ways of integrating and transferring funds – to a new system. PSD2 has been the latest in the in the role of milestones for this transition. The world is slowly becoming more united financially in the sense that we are now talking united standards and payment systems infrastructure. There are not that many small players out there anymore. This means that the whole financial payment system is being more consolidated centralized, so that little custom-made solutions are no longer there anymore. And the old kind of fragmented solution approach is no longer creating problems in the financial system. But the challenge over the last 20 years has been to, you know, slowly move from those custom made national, weird pidgin smoke signals solutions, you know, to a more standardized climate ecosystem."* (Infrastructure developer, interview)

Another important shift in *platform access* in building internal understandings at the business unit levels that regulatorily compliant risk understandings presented competitive opportunities that warranted substantive and meaningful integration into platform development and functionality.

This framing of PSD2 as an opportunity for cooperation modified the and affected already-formed ideas around how responsibility should be allocated (platform access). One significant way was for banks to, rather than just identifying at the point of agreement whether a FinTech should get platform access, was for the banks to build new relationships with FinTech actors and prepare them for the PSD2 requirements long before actual collaboration came up.

Another way was to establish new understandings of the implications of risk among intra-organisational actors involved in regulatory compliance and platform functionality:

> *"The minimum requirement if we talk about compliance functions within the bank is to identify the risk. If we have substantial risks, they should obviously be handled. But the approach we take is usually in competition with other interests within the bank, such as operational risk and also business lines. Within the PSD2 framework risks arise not only when we talk about the API's and the third-party providers, it also come up with the basic information given to customers, for example. It´s a deficiency if we don't provide the information, but it's a small cost in terms of risk. Should we take the cost now? Postpone it too later? It's always a matter of deciding... for the business to decide where should we put our money to get the best effect of it."* (Swedish bank, interview)

The inclusion of these more nuanced understandings of resource and platform access, generated through engaging internally in the organisation, further affected how the platform was developed—and resulted in considerations of how to incorporate PSD2 into the larger bank and market strategy.

4.3 Incorporation

The shift towards harmonization of risk understandings and approaches has presented banks with additional incentives to align their business and risk strategies with other market actors and third-party service providers. These surface as efforts aimed at synchronizing resource access between banks and third-party service providers (*resource access*), as well as direct strategic alignments between banks and other market actors within the fintech ecosystem (*platform access*).

In interviews with bank representatives, incorporation emerged as bids for and acceptances of partnership with small and sometimes unfamiliar actors in the financial marketplace, and attempts to strike a balance between cooperation and competition between banks and their non-bank counterparts. One example of this arose in the context of recruiting a non-bank technology company to match their services with bank customer demands and needs:

> *"We gave them the scale and they gave us innovation. Then we shared this newly generated value with customers. We were also extremely interested in their success as well. What it means to be successful in your business is that first you need to have a unique idea. So, you create some unique service proposal, which over time becomes obviously less than less unique. So, it could be copied and then you need to scale."* (Swedish bank, interview)

The process of incorporation involves not only technical adjustments and shared countrol over resources such as customer data and technical information, but also an increase in interactions and partnerships amongst different actors in the FinTech environment. Such interactions may take the form of incubating nascent firms through accelerator programmes and similar ventures, building interfaces to allow for information sharing and cooperation between banks and other market actors, or even negotiations between actors within organisations in order to ensure that perceived risks are assumed by those actors who are best able to address and manage them. Within banks, such negotiations occur within the broader governance and control frameworks of banks, which can sometimes lead to a disconnect between risk ownership and control on one hand, and regulatory compliance on the other hand.

> *"[Under PSD2, the compliance team undertakes] compliance risk assessments, identifying where the business is exposed towards compliance risks. And then it is to provide business with advice on how to reduce such risks. We can perform relevant monitoring activities where we go up to business units and look at the way they have organized their work controls, procedures and so forth in order to see, you know, are they performing their responsibilities according to the procedures and controls that have been placed? How are they performing? Are they well functioning? And importantly, could we as compliance see possible mitigating actions, reducing the risk even further? Of course compliance would be involved in any business changes through giving compliance advice. But, compliance is not a structure owner of any system. Business lines own the risk."* (Swedish bank, interview)

From an inter-organisational perspective, such attempts at acclimatisation through building partnerships and assignations of risk responsibilities do not always progress seamlessly. Particularly where the risks of non-compliance are high, banks may balk at any loss of control over the platform through technological cooperation and data sharing. Here, the issue is less relevant to competition and more relevant to perceived assumptions of prudential risk liabilities.

> *"Money laundering scandals have made the banks very restrictive, and sometimes scared. And I think sometimes they see fintechs as a risk. When we have discussions around AML* [anti-money-laundering] *and similar issues, the banks are always trying to point at the fintechs as causing the big risk… sometimes things like AML risk are used as an excuse to stop the innovation."* (FinTech branch organisation, interview)

5 Discussion: An iterative model of interplay between risk and platform governance strategy

Putting these processes together, we were able to map how both risk and platform functionalities were captured in the adaptation of existing platforms, and the building of new platform functionalities, in response to PSD2 (see Figure 1). In particular the three processes of Translation, Mobilisation, and Incorporation iteratively informed the banks' strategies and understandings when it came to platform access, which they used to allocate and pre-empt responsibility, and resource access, which they used to control and mitigate risks introduced by PSD2, specifically the new collaborations instigated by PSD2. These understandings, which are part of the platform development process, inform the three processes.

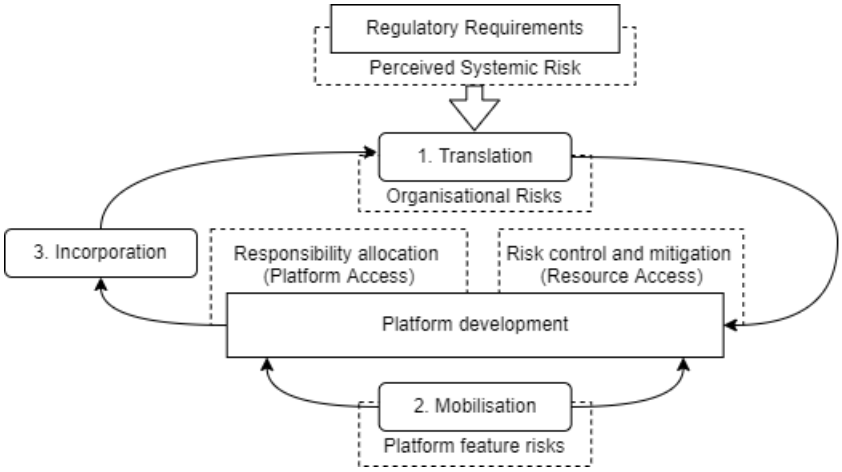

Figure 1: Iterative model of the interplay between risk and platform governance strategy

This process was not one-off or linear, but rather iterative and ongoing, with re-occurring processes. Because regulatory requirements are not static, changes in practice and precedent lead to the need for new *translations* on an ongoing basis. New organisational risks, for instance because of new collaborations or new services being developed outside of PSD2, may also lead to new instances of *translation*. We further know that platform features that result from platform development may be used in unforeseen ways, leading to the need for a *mobilisation* response.

Rather unsurprisingly, the regulatory requirements are treated by all as an exogenous and given variable that affects, and informs, subsequent processes. Possible systemic risks, and the ways in which they might manifest, were typically considered as being implicit—or accounted for—in the regulations. What then begins is an iterative process, wherein the regulations are ***translated*** both into technology terms, and into terms that can help them make sense of the organisational risks that result from the requirements of the legislation.

This, in turn, leads to ***platform development*** within the organisation; specifically, through the identification of platform functionalities that allow the banks to comply with the requirements of the legislation, while also limiting (or at least mitigating) the risks to the organisation. An example of this is in the implementation of multi-factor identification for transaction verification to protect security, or the building of multiple parallel APIs with different areas of operations—one bank, for instance, offered both a payments and data API and a separate API to enable automated FX trading. However, *access openness* and *resource openness* were not always separated. Instead, platform owners decided resource openness *ex ante,* as part of their overarching strategy around what kind of platform to build and what functionalities to offer. They then distinguished between would-be apps either on a case-by-case basis or through differentiated APIs that offered distinct and different bundles of functions.

However, the development of these new functionalities introduced new threats to the organisation; some of them perceived as coming directly from the engagement with FinTech actors, and others an indirect

result of not just following the exact requirements of PSD2, but by going beyond what PSD2 required, as one bank was particularly included to do. Elsewhere, this has been called an iatrogenic risk, or a risk introduced through mitigating/limiting another source of risk (Wiener, 1998).

The above initiated a process of ***mobilisation***, wherein both developers and others responsible for the platforms engaged with internal stakeholders not only to obtain resources, but also to handle perceptions that the mere fact of engaging with this platform development and business model was, broadly, a threat to banking and, more specifically, a threat to the jobs of individual employees at the bank. To some degree, this process could serve as a bottleneck in the development process: work stalled as developers and platform enthusiasts negotiated with other factions within the banks. Their ability and failure to mobilise resources and support, in turn, affected how much time and resources they could commit to platform development, and indirectly the functionalities that they could invest in.

In order to inform the ongoing translation process, the banks turned to a third process of ***incorporation***. In this process, the banks obtained information and built relationships that would further the other two processes. For instance, by building their own in-house incubators and working with would-be FinTech entrepreneurs before those entrepreneurs even had a functioning app, the banks were able to both obtain information about what FinTech entrepreneurs wanted to do with their (and others') platform, and they also had the opportunity to "prepare" the entrepreneurs, by teaching them safe practices and supporting them not only in being innovative, but in taking care with customer data. These relationships with the FinTechs, in turn, affected proposals for new functionalities—which were then assessed as part of the translation process, in comparison with the requirements (and limitations) of the regulations. Lastly, incorporation allowed platform supporters within the banks to build relationships that would aid them when trying to mobilise for resources and support within the organisation.

As new information, for instance new praxis or case law (external to the organisation, but which affect organisational risks) or feature risks, for instance API weaknesses or instances of misuse (internal to the organisation), the process iterates again. In practice, the presence of these new sources of information and their assessment and evaluation, are ongoing.

6 Conclusion and directions for future research

Previous research on platform architecture and governance has focused predominantly on boundary infrastructure and resources (Eaton et al., 2015; West, 2003; Karhu et al., 2018). Less research attention has been paid to governance as a process itself (although see O'Mahony & Karp, 2020). The findings of our study thus deepen current understandings of platform architecture and governance literature by providing a process view of platform development and risk as result of the implementation of PSD2.

This study also introduces new insights by examining the relatively unexplored influence of risk and risk perceptions on the platform development and governance process as relevant to platform development. What emerges is an understanding of platform governance as an iterative inter- and intra-organisational process centred around three connected conceptual stages, namely: (1) translation; (2) mobilization; and (3) incorporation, both of which consider and articulate access to resources and access to the platform. Risk perceptions, when it comes to organisational as well as systemic risks, are captured in an iterative process between and within organisational actors in the organisations that own open banking platforms. Their interactions frame, and are affected by, understandings of both systemic and organisational risk. These, in turn, play a role in the three stages that collectively influence both structural and resource dimensions of platform development and access.

Our study supports two main conclusions. First, that platform architecture and governance is dictated not only by technological and resource considerations but is also inextricably influenced by risk understandings and perceptions. While extant research treats IT as either a way to mitigate risk (e.g., Ren & Dewan, 2015), or something that introduces new risks (themselves to be managed) during implementation (e.g., Ogawa & Piller, 2006; Sadeh & Dvir, 2020; Scott & Vessey, 2002), this research unpacks the interplay between risk and platform strategy, resulting in an un-black-boxing of the

processes involved. Implicit in this is, of course, the idea that the risk perceptions within open banking—both around the technologies and those stemming from entrepreneurs—directly affect both how the phenomenon unfolds and would-be FinTech entrepreneurs who are dependent on their platform (Cutolo & Kenney, 2020).

Second, that the challenges posed to platform owners due to these interdependencies are in many respects distinct from those posed to other market actors, due to their legal and moral responsibility for their customers' money and data (Wolters & Jacobs, 2019). Their attempts to balance the risks of PSD2 compliance ("opening up") against their responsibilities to their users manifests itself in an iterative process in which they try to understand, mobilise, learn, and apply. In so doing, they gradually build a clearer picture not just of the perceived risks involved, but also what their platform strategy and platform functionalities should be as a result, consistent with research elsewhere into platform emergence under conditions of uncertainty (Dattée et al., 2018). This analysis informs—and even influences—the degree of openness that platform owners decide allow for their platforms. Importantly, we find competing understandings of risk as relevant to regulatory versus market demands, which introduce a degree of potentially unarticulated tension in platform owner decision-making.

Of relevance in this regard is a recurrent finding that for incumbent banks, new regulatory logics are often at odds with applicable business logics and legacy systems of technology; not only is there push-back when digital transformations begin to occur (Sebastian et al., 2017), but internal processes that iterate between the technologies (here, platform functionalities) and social factors like risk perception, inform and influence the digital transformation itself. This concrete conceptualisation of where this occurs contributes to our understanding of the difficulties that platform leaders face in developing an integrated approach towards platform governance (Huber et al., 2017), but suggest avenues for future research.

6.1 Limitations and future research

With regard to the strong potential and need for further research in this area, the following limitations and potential future avenues are important to note. Due to the sensitivity that PSD2 and open banking has come to have for some banks in terms of strategy and competition, many interviewees were not as detailed in their discussions of either their motivations or their risk identification and mitigation processes as they might have been through a more in-depth and longitudinal investigation. Recognizing this limitation, we recognize the potential for future work involving deeper case studies within individual organisations and focusing on specific technical development initiatives in this space. In this current endeavour, we have relied on the bank and FinTech actors' descriptions of the functionalities involved and employed a necessary integrated multi-disciplinary perspective in our research design. The focus on functionalities that has emerged through this work opens up a rich potential line of deeper research that may be strengthened through the addition and further integration of design science approaches in future endeavours (Ågerfalk, 2018).

References

Ågerfalk, P. J. (2018). Whither design science research? *European Journal of Information Systems*, *27*(2), 127–127.

Arora, N., Gandhi, P., & Longstaff, F. A. (2012). Counterparty credit risk and the credit default swap market. *Journal of Financial Economics*, *103*(2), 280–293.

Berglund, H. (2007). Risk conception and risk management in corporate innovation: lessons from two Swedish cases. *International Journal of Innovation Management*, *11*(04), 497–513.

Boudreau, K. (2010). Open platform strategies and innovation: Granting access vs. devolving control. *Management Science*, *56*(10), 1849–1872. https://doi.org/10.1287/mnsc.1100.1215

Boudreau, K. J., & Hagiu, A. (2009). Platform rules: Multi-sided platforms as regulators. *Platforms, Markets and Innovation*, *1*, 163–191.

Ceccagnoli, M., Forman, C., Huang, P., & Wu, D. J. (2012). Cocreation of Value in a Platform Ecosystem: The Case of Enterprise Software. *MIS QUarterly*, *36*(1), 263–290.

Crawford, J., Kashyap, S., Nilsson, F., Stockenstrand, A.-K., & Tirmén, M. (2017). Accounting and control in banks: A literature review. *Bank Regulation*, 15–63.

Cutolo, D., & Kenney, M. (2020). Platform-Dependent Entrepreneurs: Power Asymmetries, Risks, and Strategies in the Platform Economy. *Academy of Management Perspectives*, *March 2021*. https://doi.org/10.5465/amp.2019.0103

Dattée, B., Alexy, O., & Autio, E. (2018). Maneuvering in poor visibility: How firms play the ecosystem game when uncertainty is high. *Academy of Management Journal*, *61*(2), 466–498. https://doi.org/10.5465/amj.2015.0869

De Reuver, M., Sørensen, C., & Basole, R. C. (2018). The digital platform: A research agenda. *Journal of Information Technology*, *33*(2), 124–135. https://doi.org/10.1057/s41265-016-0033-3

di Renzo, B., Hillairet, M., Picard, M., Rifaut, A., Bernard, C., Hagen, D., Maar, P., & Reinard, D. (2007). Operational risk management in financial institutions: Process assessment in concordance with Basel II. *Software Process: Improvement and Practice*, *12*(4), 321–330.

Eaton, B., Elaluf-Calderwood, S., Sørensen, C., & Yoo, Y. (2015). Distributed Tuning of Boundary Resources: the Case of Apple's Ios Service System. *MIS Quarterly*, *39*(1), 217–243.

Ellis, S. J., Aalbers, R., Khanagha, S., & Tuertscher, P. (2021). Firm legitimacy in the face of nascent ecosystemic uncertainty. *European Group for Organisation Studies*.

Ghazawneh, A., & Henfridsson, O. (2013). Balancing platform control and external contribution in third-party development: The boundary resources model. *Information Systems Journal*, *23*(2), 173–192. https://doi.org/10.1111/j.1365-2575.2012.00406.x

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2012). Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology. *Organisational Research Methods*, *16*(1), 15–31. https://doi.org/10.1177/1094428112452151

Giovannoni, E., Quarchioni, S., & Riccaboni, A. (2016). The role of roles in risk management change: The case of an Italian bank. *European Accounting Review*, *25*(1), 109–129.

Hu, D., Zhao, J. L., Hua, Z., & Wong, M. C. S. (2012). Network-Based Modeling and Analysis of Systemic Risk in Banking Systems. *MIS Quarterly*, *36*(4), 1269–1291.

Huber, T. L., Kude, T., & Dibbern, J. (2017). Governance practices in platform ecosystems: Navigating tensions between cocreated value and governance costs. *Information Systems Research*, *28*(3), 563–584. https://doi.org/10.1287/isre.2017.0701

Jacobides, M. G., Cennamo, C., & Gawer, A. (2018). Towards a theory of ecosystems. *Strategic Management Journal*, *39*(8), 2255–2276. https://doi.org/10.1002/smj.2904

Kaplan, R. S., Leonard, H. B. D., & Mikes, A. (2020). The risks you can't foresee: what to do when there's no playbook. *Harvard Business Review*, *98*(6).

Kaplan, R. S., & Mikes, A. (2016). Risk management—The revealing hand. *Journal of Applied Corporate Finance*, *28*(1), 8–18.

Karhu, K., Gustafsson, R., & Lyytinen, K. (2018). Exploiting and defending open digital platforms with boundary resources: Android's five platform forks. *Information Systems Research*, *29*(2), 479–497. https://doi.org/10.1287/isre.2018.0786

Lim, B. (1995). Examining the organisational culture and organisational performance link. *Leadership & Organisation Development Journal*.

Miles, M.B. and Huberman, A.M., 1994. *Qualitative data analysis: An expanded sourcebook*. Thousand Oaks, CA: Sage.

Ogawa, S., & Piller, F. T. (2006). Reducing the risks of new product development. *MIT Sloan Management Review*, *47*(2), 65.

O'Mahony, S., & Karp, R. (2020). From proprietary to collective governance: How do platform participation strategies evolve? *Strategic Management Journal*.

Onwuegbuzie, A.J. and Leech, N.L. (2007). Validity and qualitative research: An oxymoron?, *Quality & quantity*, 41(2), pp.233-249

Pablo, A. L. (1999). Managerial risk interpretations: does industry make a difference? *Journal of Managerial Psychology*.

Ren, F., & Dewan, S. (2015). Industry-level analysis of information technology return and risk: what explains the variation? *Journal of Management Information Systems*, *32*(2), 71–103.

Rietveld, J., Ploog, J. N., & Nieborg, D. B. (2020). The Co-Evolution of Platform Dominance and Governance Strategies: Effects on Complementor Performance Outcomes. *Academy of Management Discoveries*, *forthcomin*. https://doi.org/10.5465/amd.2019.0064

Rolland, K. H., & Monteiro, E. (2002). Balancing the local and the global in infrastructural information systems. *The Information Society*, *18*(2), 87–100.

Sadeh, A., & Dvir, D. O. V. (2020). The effect of technological risk, market uncertainty and the level of complexity on new technology ventures' success. *International Journal of Innovation Management*, *24*(5), 1–25. https://doi.org/10.1142/S1363919620500474

Scott, J. E., & Vessey, I. (2002). Managing risks in enterprise systems implementations. *Communications of the ACM*, *45*(4), 74–81.

Sebastian, I. M., Ross, J. W., Beath, C., Mocker, M., Moloney, K. G., & Fonstad, N. O. (2017). How Big Old Companies Navigate Digital Transformation. *MIS Quarterly Executive*, *2017*(9), 197–213.

Svahn, F., Mathiassen, L., & Lindgren, R. (2017). Embracing digital innovation in incumbent firms: How Volvo Cars managed competing concerns. *MIS Quarterly: Management Information Systems*, *41*(1), 239–253. https://doi.org/10.25300/MISQ/2017/41.1.12

Tarashev, N. A., Borio, C. E. v, & Tsatsaronis, K. (2010). *Attributing systemic risk to individual institutions* (No. 308). BIS Working paper.

Tiwana, A. (2015). Evolutionary competition in platform ecosystems. *Information Systems Research*, *26*(2), 266–281.

Tiwana, A. (2018). Platform synergy: Architectural origins and competitive consequences. *Information Systems Research*, *29*(4), 829–848. https://doi.org/10.1287/ISRE.2017.0739

Tufano, P. (2003). Financial innovation. *Handbook of the Economics of Finance*, *1*, 307–335.

West, J. (2003). How open is open enough? Melding proprietary and open source platform strategies. *Research Policy*, *32*(7), 1259–1285. https://doi.org/10.1016/S0048-7333(03)00052-0

Wiener, J. B. (1998). Managing the iatrogenic risks of risk management. *Risk: Health, Safety & Environment* , *9*(1), 39.

Wolters, P. T. J., & Jacobs, B. P. F. (2019). The security of access to accounts under the PSD2. *Computer Law & Security Review*, *35*(1), 29–41.

Yin, RK (2009). *Case study research: Design and methods.* Thousand Oaks, CA: Sage.

Yoo, Y., Henfridsson, O., & Lyytinen, K. (2010). The new organizing logic of digital innovation: An agenda for information systems research. *Information Systems Research*, *21*(4), 724–735. https://doi.org/10.1287/isre.1100.0322