

PSD2 INFLUENCE ON DIGITAL BANKING TRANSFORMATION - BANKS' PERSPECTIVE

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Abstract: The European Union government has forced banks to open and make their customer information accessible with their permission, for other players in the financial market to use and take part of that business, in order to make the banking industry more innovative, stimulate new ideas in the payments market and better regulate existing legal frameworks for payment and banking services across the EU. This paper analyzes the impact that the revised PSD2 Directive has on the digital transformation of banking across the European Union.

Keywords: PSD2, digital banking transformation, banking industry, European Union

Introduction

Harmonized payment markets within the European Union (EU) are a precondition for a single European market. Through the first Payment Services Directive - PSD1, in 2007, the EU established some common payment rules to remove entry barriers and to provide fair conditions that would increase competition in the EU payment market, as well as to simplify and fully harmonize sets of rules regarding the use of payment services. This directive represented the first, comprehensive EU payment legislation that facilitated access to new market players, providing greater transparency and reduced consumer information, strengthening their rights and clarifying obligations, which helped create the Single European Payments Area (SEPA) in practice (Eide&Hallum, 2018). Its scope included all payments in EU / EEA territory, in the currencies of the countries mentioned (Deutsche Bank AG, 2017).

Due to changes in the financial services industry and the payments sector, most notably in the area of new electronic payment services and their providers, as well as in the wants and needs of technology-savvy consumers (Forester, Rolfe & Brown, 2017), PSD1 had to be updated, thus incorporating technological innovations as well as further clarification, enhancement and protection (Noctor, 2018) to better regulate the legal framework for payment and banking services across the EU (Forester, Rolfe & Brown, 2017). For these reasons, the European authorities have adopted a revised Payment Services Directive (PSD2) (Choi & Park, 2019), which, inter alia, extends the framework to all foreign currencies across the EU / EEA, as well as to payment transactions in all currencies in which only one participant in EU / EEA territory (Deutsche Bank AG, 2017).

PSD2 entered into force on 13 January 2016, with an obligation for all EU Member States and European Economic Area (EEA) countries to implement it in their national laws by 12 January 2018 (Forester, Rolfe & Brown, 2017). The real challenges raised by the implementation of PSD2 concern how the region will overcome an overly fragmented, centralized hierarchically inherited framework to allow for the necessary changes to respond to digital market initiatives (Choi & Park, 2019).

The revised PSD2 is a key directive for borderless banking and payment services that has set the stage for pan-European open banking. In addition, another significant regulatory trend is the implementation of the General Data Protection Regulation (GDPR) of May 2018, which establishes a regulatory framework for controlling customers over their financial and personal data through consent mechanisms (Forester, Rolfe & Brown, 2017).

This paper analyzes the impact that the revised PSD2 Directive has on the digital transformation of banking across the European Union. In Chapter 1, the author elaborated on the market changes resulting from the mandatory application of the PSD2 open banking API concept that led to new types of services and new entrants to the financial market. Chapter 2 presents the two main topics covered by the PSD2 Directive, while Chapter 3 presents an overview of the market situation in Central and Eastern Europe. In Chapter 4 the author states potential problems, opportunities, new strategies and operating models that banks can choose according to their plans for further development, in order to be as adequately represented in the new financial services market. This chapter gives examples of new business models across the EU, followed by concluding considerations.

1. PSD2 regulation

The banking industry has long been highly regulated and controlled. In order to make it more innovative and stimulate new ideas in the payments market, the European Union (EU) government has forced banks to open up and make their customer information available with their permission so that other players in the financial market (TPP) can use them and take some of that work. Regulatory open banking allows companies to provide more accurate personal financial guidance to customers, tailored to their circumstances

and delivered securely and confidentially (Mansfield-Devine, 2016).

1.1. Open Banking API Concept

For secure sharing of customer information in open banking, banks must provide APIs to achieve interoperability (Mansfield-Devine, 2016). API technology is the accepted standard for securely sharing and embedding data in an online environment, which defines how software should communicate (<https://www.ukfinance.org.uk/>).

APIs come with technical specifications, testing capabilities and clear legal and operational conditions under which they can be used. For many years, major companies called Techfins (Omarini, 2018) such as Google, Twitter, Facebook, and Uber have been offering APIs to third parties for data sharing and platform connectivity (Forester, Rolfe & Brown, 2017), since 2006 they have also started to be used in the financial industry (World Economic Forum, 2017), while today they are imperative. PSD2 obliges all banks to allow TPPs to access account information and payment initiation services if and only if the buyer has explicitly authorized TPP to initiate such requests and if TPP is registered by the competent financial authority of its home country (Forester, Rolfe & Brown, 2017). Although this concept sounds promising, it's also a big security challenge. EMEA Vice President Mark Noctor believes that if banks are required to provide APIs for third-party applications, both third parties and banks must adopt the same security standard so that industry-wide inconsistencies and practical problems of using these APIs do not occur. (Noctor, 2018), which, as Mansfield-Devine (2016) believes, will most likely require an expensive brand new infrastructure (Mansfield-Devine, 2016).

In addition to the challenge of proper API standardization, another challenge is the collective education of customers about new capabilities and safe behavior when they control third party financial and personal data (Forester, Rolfe & Brown, 2017).

The two main topics covered by PSD2 refer to the introduction and regulation of new parties and services in the e-banking market, as well as the establishment of new rules for licensed third-party providers to use the newly opened banking infrastructure related to customer account access (XS2A), with their express permission, with additional improvements to payment processing security through the introduction of Regulatory Technical Standards (RTS) for strong customer authentication (SCA) (Forester, Rolfe & Brown, 2017).

1.2. New services and participants in the financial market

In recent years, the biggest competitors in the financial market are FinTech companies. FinTech is an acronym for financial technology, so we can represent these companies as “entities using new technologies to offer products that are either complementary or competitive to related products offered by regulated financial institutions” (Kuszewski, 2018, p. 5). They aim to improve the user experience and increase process efficiency, as well as redesign traditional services to make them more personalized, transparent and accessible through digital channels, which will represent alternatives to traditional financial services (Vasiljeva&Lukanova, 2016). Fintech is the largest investment category in Europe (accounting for 20% of all global investment) and is more prevalent than in Asia and the US (<https://thefintechtimes.com/european-fintech/>).

With the implementation of PSD2,

new major players have emerged on the market, such as:

- ASPSP (Account Servicing Payment Service Providers) - banks that provide account servicing
- TPP (Third Party Payment Service Providers) - third party providers (FinTechs and other market players), representatives of payment institutions that do not have payment accounts and have a limited scope of activities. They can be:
 - o PISP - Provider of payment initiation service on behalf of the client
 - o AISP - Client Account Information Service Provider (Saarnilehto, 2018).

PISPs typically play a mediating role between buyer and merchant, offering them a new payment initiation service (PIS), which is an alternative to making online payments without using a payment card. The PISP establishes a gateway between the merchant's website and the client bank's online banking platform and provides simpler and cheaper payment services to individuals and companies with instant merchant notification of payment initiation (Forester, Rolfe & Brown, 2017). When making an online purchase, the purchase details are transferred to the PISP, which will

- redirect the customer to the bank for authentication and checking with the bank whether the purchase transaction can be carried out, where after the bank's verification the customer will be redirected to the online store to complete payment and order the goods
- or conduct login information to and from the bank so that payment can be made without interruption of service (Saarnilehto, 2018).

In order for this service to be enabled, the customer must explicitly authorize PISP to initiate payment on his behalf on his bank account (Forester, Rolfe & Brown, 2017). Figure 1 shows an illustrative model of the role that PISP plays in the financial market.

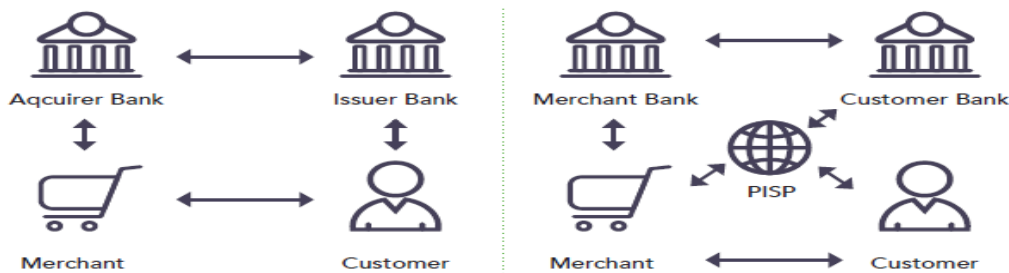


Figure 1. Illustrative role of PISP. Source: Forester, Rolfe & Brown (2017)

A practical example of business use of startup payment services (PIS) is the German company Sofort (<https://integration.sofort.com>), which collaborates with online stores and a shopping platform software. The company does not have any means of payment at any stage of the process and is merely a technical intermediary who initiates the money transfer service that comes from the user's online banking (Możdżyński, 2017).

AISPs are designed to allow customers to view 360 degrees of their payment account information (Forester, Rolfe & Brown, 2017). They provide a

new service (AIS) for providing consolidated information online about all of a user's payment accounts (one or more) that he has with different banks (Saarnilehto, 2018), through one online portal for account consolidation and payment history categorization (Forester, Rolfe & Brown, 2017). The idea is to facilitate the use of online banking by allowing clients to have a useful comprehensive view of their finances (Saarnilehto, 2018), so they don't need to sign in separately to each bank's internet platform (Forester, Rolfe & Brown, 2017). Figure 2 shows an illustrative model of the role that AISP plays in the financial market.

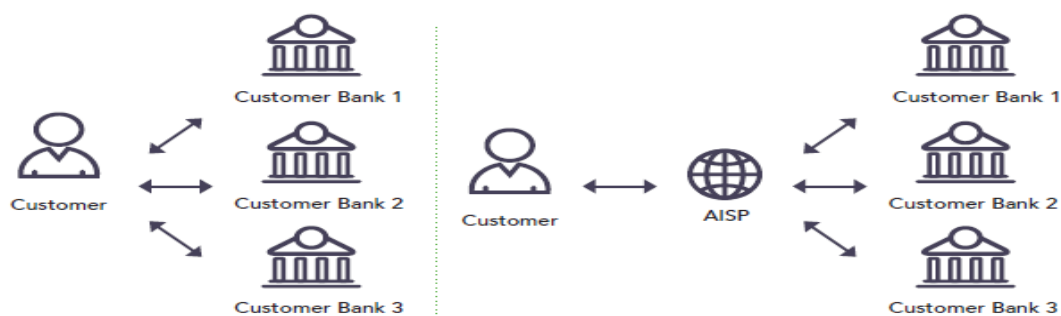


Figure 2. Illustrative role of AISP. Source: Forester, Rolfe & Brown (2017)

An example of the practical business use of an AIS is the company Zaplo (www.zaplo.pl) which competes with market banks in the rapid approval of a certain amount of credit to customers. The service operates in such a way that the client provides login information for his bank account to an entity - Swedish company Instantor (www.instantor.com),

which plays the role of AISP and can analyze the transaction history on customers account for the last 12 months. On this basis, the credit company is able to check the creditworthiness of the consumer and make an immediate decision to grant or refuse credit (Możdżyński, 2017).

Banks can decide whether to market themselves as ASPSPs or as TPPs, where they will fight for customers with FinTech companies and other market players. Many banks invest in or buy FinTech companies to digitize their services more and offer new solutions (Vasiljeva&Lukanova, 2016).

1.3. Account access rules and strong authentication

The overriding goal of PSD2 is to remove the legal monopoly of banks to access their clients' accounts (Wolters &Jakobs, 2019), as FinTechs and other new entrants can survive in this new environment only through banking data they can access through the API, due to high capital requirements and other costs which represent huge barriers to entry and starting a business (Choi & Park, 2019). The exact design of this approach depends on common and secure open standards of communication as well as Regulatory Technical Standards (RTS) for strong customer authentication (Wolters &Jakobs, 2019), which are legal documents for specifying certain aspects of EU directives and regulations (Saarnilehto, 2018) and impose stricter security measures than PSD2 (Wolters &Jakobs, 2019). In addition to the obligation to provide specific customer information, banks are also required to protect personal information and prevent

fraud. Access to the accounts provided by banks to TPPs should be limited to the information necessary for the provision of payment services by TPPs. Contractual restrictions should not go beyond what is necessary to prevent fraud and protect the user, as measures against the abuse of this approach can easily be interpreted as an illegal restriction on competition (Wolters &Jakobs, 2019).

Access to banking customer information should be non-discriminatory, objective and proportionate, and in the form of two new services: AIS and PIS (Saarnilehto, 2018). PSD2 and RTS require payment service providers to apply strong customer identification where the payer (individually or through an intermediary) accesses their payment account, initiates an electronic payment transaction, or performs any transaction through a remote channel, which may entail the risk of payment fraud or other abuse. The concept of authentication refers to procedures that allow a payment service provider to verify the identity of a payment service user or the validity of using a particular payment instrument, including the use of user-personalized security details. Strong customer authentication (aka two-factor authentication - SX2A) is an authentication based on the use of at least two basic factors for identity verification, shown in Figure 3 (Steennot, 2018).

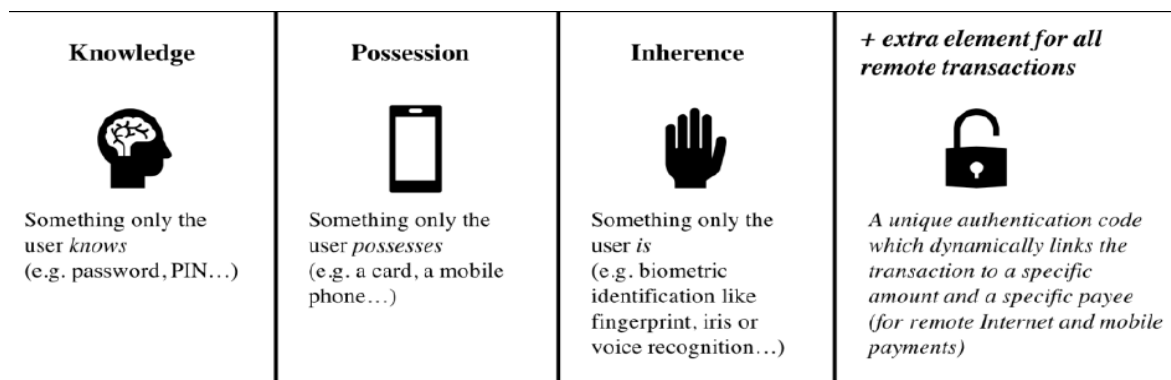


Figure 3. Factors for strong customer authentication. Source: Eide&Hallum (2018)

These elements must be independent so that the breakdown of some does not compromise the reliability of the others. For electronic transactions initiated through the Internet, there is an additional requirement that payment service providers must use dynamic codes to confirm the identity of transactions, ie. they need to apply strong user authentication that includes elements that associate the transaction with a certain amount and a specific payee (Steentot, 2018). These rules should already have started to apply on 14 September 2019, but the EBA extended this deadline until the end of 2020. However, card schemes and e-merchants are putting increasing pressure to postpone the entry into force of the SCA rules for the second time beyond the end of 2020, due to COVID-19 pandemic situation (BEUC, 2020).

2. Central and Eastern European market situation

Deloitte conducted a survey among 90 European banks in Central and Eastern Europe (CEE) and Western Europe (WE), with a particular focus on CEE banks. The survey included 24 WE banks (Banks in Belgium, Germany, Ireland, Italy, Spain, Sweden, Switzerland and the United Kingdom) and 66 CEE banks (Banks in Bulgaria, Croatia, Czech Republic, Hungary, Latvia, Poland, Romania, Slovakia and Slovenia).

In Central Europe, two different categories of banks have been identified based on their approach to the PSD2 directive, the so-called "Challengers" and "Minimalists." The challengers are large universal banks, open to new

opportunities, actively preparing for PSD2 and having a clear vision of its impact as well as their own potential response. The vast majority goes towards a cooperative strategy with third parties. Minimalists are small and medium-sized banks that tend to follow the defensive approach only by aligning with PSD2 or have not yet established a strategy, nor have a clear vision of the impact of PSD2. Only a small group of Minimalists recognize PSD2 as an opportunity for growth, whether using aggressive or collaborative strategies. WE banks see PSD2 more as an opportunity than CEE banks, so the majority is focused on an aggressive approach to gaining market share and is more advanced than CEE challengers in their preparations for compliance. Many WE banks are parent banks and branches of banks operating in the CEE.

2.1. Perception of PSD2

Challengers in the largest percentage (35%) consider PSD2 a threat, and 19% see it as an opportunity, while most of the minimalists are driven by the opportunities that PSD2 offers (as many as 27%), and only 13% are motivated by threats that will potentially arise. WE banks are more likely to see PSD2 as an opportunity (29%) than a threat (21%). When looking at the results of these understandings across countries (Figure 4), we see that the results are relatively consistent across major CEE markets. PSD2 is perceived as an opportunity in approximately 30% of banks, while those who perceive it as a threat are between 11% and 20% in different countries.

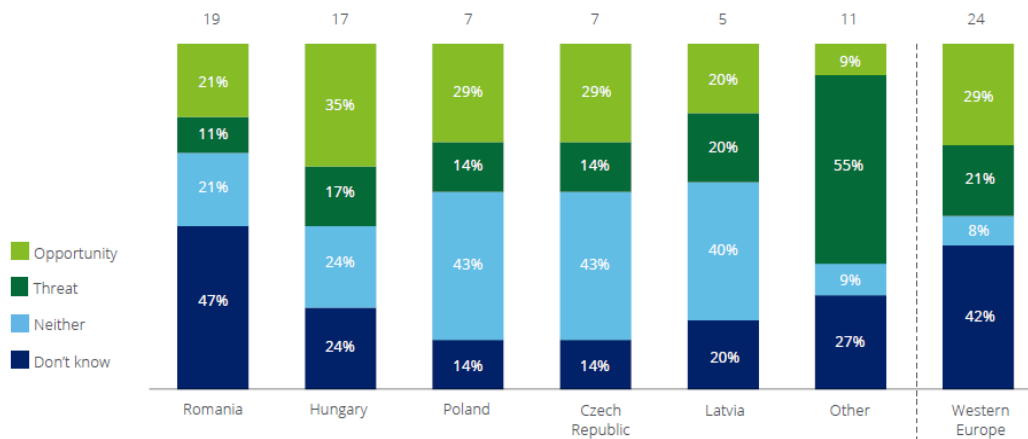


Figure 4. Perception of PSD2 by different countries. Source: Brich et al., (2018)

2.2. Approaches to implementing PSD2

In keeping with the PSD2 directive's understanding of the opportunity or potential threat, the approaches to implementing the PSD2 directive also differ in various countries. Challengers are most open to PSD2 capabilities: 42% follow a collaborative strategy, and 4% follow an aggressive

approach that actively embraces PSD2. Minimalists are pursuing a collaborative strategy in 15% of cases, while 8% plan to use an aggressive approach. In contrast, 42% of ZE banks implement an aggressive market share growth strategy and only 13% a cooperative strategy. The different market approaches and progress of PSD2 initiatives in CEE across countries are shown in the following graph (Figure 5).

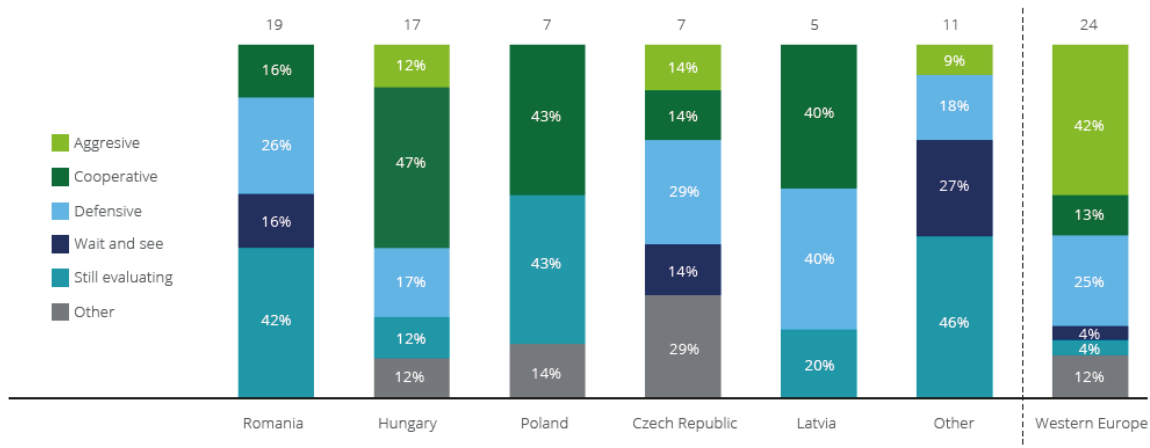


Figure 5. Different market approaches and progress of PSD2 initiatives in CEE. Source: Brich et al., (2018)

About one-third of CEE respondents characterized their response as: aggressive by 9-14% depending on the country and cooperative between 14-47%. In general, there are significant differences between CEE countries, partly caused by the different speeds of national legislative processes. The Czech Republic and

Hungary reported the highest share of aggressive players (12% and 14% respectively). Hungary, Poland and Latvia accounted for the largest share of banks using the cooperative approach (47%, 43%, 40% respectively).

2.3. Willingness to invest and expected impact on the market

Willingness to invest in implementing cooperative and aggressive strategies differs according to identified bank segments. Differences in the budget allocated for the alignment of CEE and WE banks with the Directive are related to the size of the institutions. The disturbing fact is that there is a significant proportion of CEE banks that do not have a dedicated

budget to comply with PSD2 (27-55%), especially when compared to only 4% in the WE. Also disturbing is the fact that 43% of CIEs are challengers and only 15% of minimalists have set a budget to respond to PSD2 from a strategic perspective. In the following graph, we can compare the allocated budget for the strategy and the PSD2-aligned ones across different CEE countries (Figure 6).

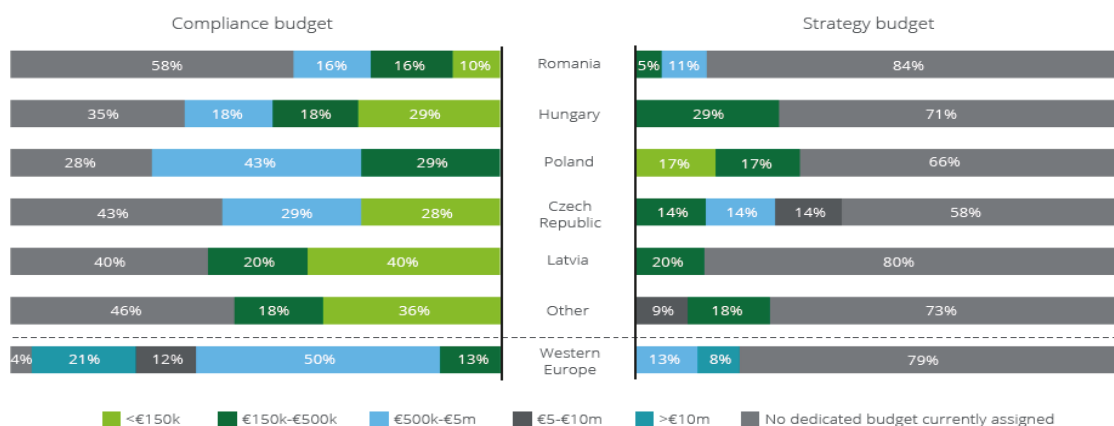


Figure 6. Budget allocated for the strategy and aligned with PSD2 by different CEE countries. Source: Brich et al., (2018)

The size of the law enforcement budget varies significantly among banks in the CEE market. One reason is the different speed of legislative processes, the other is the different size of banks in individual markets. Poland reported the smallest share of banks with no budget allocated for compliance (28%). Interestingly, 58-84% of CEE respondents did not have the budget allocated to their strategic response to PSD2. While there is considerable discussion in the banking industry about the threats and opportunities posed by PSD2, several committees have still earmarked funds for their PSD2 strategy - the Czech Republic (42%) and Poland (34%) have the largest share of banks allocated budget for PSD2 strategies.

In the product category, PSD2 is expected to have the largest impact in the area of payments (91%), followed by day-to-day banking (65%) and customer loans (47%), while the largest changes in the

segments category are expected in the retail segment (73%), small and medium enterprises (45%) and the commercial banking market (30%).

3. Potential problems, opportunities, strategies and operating models for banks

Prior to PSD2, banks had a monopoly on the financial market and controlled access to customer accounts, while other payment service providers had no legal right to access this information. PSD2 eliminates this competitive advantage and leads to potential problems for banks (Wolters & Jacobs, 2018), which are reflected in the fight against new competition, reduced customer interaction, potential loss of market share, and reduced revenue, as well as problems in ensuring customer safety and security in defend against cybercriminals.

Banks, on the other hand, can take advantage of the fact they are perceived as sound financial institutions, and if the opportunities allow them, they can implement a strategy that will win new markets as innovators in technology, or they may choose another strategy, such as collaborating with FinTech companies, which potentially can bring certain benefits.

3.1.Potential problems

PSD2 is generally disadvantageous for banks, which, as ASPSPs, have an obligation to establish, maintain, and provide a system that facilitates access to customer information and also have an obligation to repay an unauthorized or faulty payment transaction, even if the transaction is initiated through a payment initiation service provider (Wolters & Jacobs, 2018). Banks spend an enormous amount of money on security because their reputation depends on it. However, while banks have high security, third-party applications are not under the same scrutiny and do not consider security a priority, but considering that banking applications are required to provide APIs for third-party applications, they should adopt the same security standard (Noctor, 2018). This is also shown by the fact that card schemes and e-merchants are putting pressure to postpone the entry into force of the SCA rules for the second time (BEUC, 2020). In addition, banks face new competition, with PSD2 causing them to have a lower direct interaction between them and its customers, which weakens their ability to sell other products or services, detect fraud (Wolters & Jacobs, 2018) and at the same time reduces their institutional position in the everyday life of customers (Omarini, 2018).

The entry of TPP into the marketplace will turn current online payment service providers into a point of interest for cybercriminals (Saarnilehto, 2018). The number of frauds on the Internet increased even before the outbreak of the COVID-19 situation, but with the

onset of the crisis, a significant number of frauds appeared in line with the increase in e-commerce transactions (BEUC, 2020). The security issue can also be related to the use of APIs. Every application available for download is particularly vulnerable because hackers are able to isolate it in the sandbox environment and repeatedly attack it until they find a way through its security. Once an application is hacked and accessed by APIs, cybercriminals can use it to trick the system into recognizing them as a legitimate client and allow them access to everything that the API is authorized to connect to. In order to prevent cheating, code fixing measures must be used (Noctor, 2018), (<https://www.arxan.com/>). Andrew Whaley, Vice President of Arxan and former lead engineer at Barclays Bank, points out concerns about AISP that will not only gain access to bank users' data, but will be able to aggregate and store them on their servers from where they can be stolen (Mansfield-Devine, 2016).

The banking industry, while adhering to PSD2 guidelines, will need to find a way to ensure secure access to data and permit management while preventing application manipulation. In PSD2, it is quite clear that banks will be responsible for the ownership and security of customer data and, moreover, for the confidentiality of that data (Noctor, 2018), (<https://www.arxan.com/>). Some of the problems also arise with respect to the misuse of the user's consent, which is that companies may use the payment information without the user's consent, or attempt to obtain their tacit consent in a discreet manner; they can use the data for purposes not said or presented to the user in a vague way, etc. (Saarnilehto, 2018). Concerns have also been expressed about cases where consumers withdraw consent previously given to Fintech / Techfin or when they request the removal of their personal data about their payments from the database (Politou, 2019).

The negative implications for banks may also be reduced revenue due to competitive pricing, loss of market share in favor of AISP and PISP, and fewer cross-selling opportunities due to lower customer interactions. This can have a major negative impact if banks retain account and transaction management, with third-party providers controlling financial management and initiating transactions, thereby leaving banks at a loss of contact with customers and giving the role of financial anchor to third parties. The worst case scenario would be that banks are reduced to providers of balance sheets, current account transactions and payments from transaction accounts (Botta, Digiacom, Höll. & Oakes, 2018). According to a 2016 European PWC Strategy survey, European bank executives found mixed but mostly negative perceptions of PSD2, and their position in the open banking world as vague, with 68% of them feeling that they would be weakened as a result of PSD2, 68% of them concerned about losing control of their user interface, and 52% think there will be a risk of liability issues (Forester, Rolfe & Brown, 2017).

3.2.Potential opportunities

While PSD2 poses serious threats to current business models, some authors think that it also offers banks the opportunity to compete as innovators in technology, who can use their vast customer databases to gain valuable insights. If third parties do not gain the full trust of clients, banks could retain their role as a reliable financial anchor (Botta, Digiacom, Höll. & Oakes, 2018). Wolters & Jacobs (2018) state that banks may choose to enter the market as PISPs and AISPs, and that PSD2 gives them the opportunity to gain access to the accounts of other banks' clients. However, these opportunities are unlikely to outweigh the disadvantages of increased competition, as banks are expected not only to face increased competition from other banks, but also with large technology companies

such as Facebook, Apple, Amazon, Microsoft and Google (Wolters & Jacobs, 2018).

Potential positive implications for banks are revenues from new products / services, the opportunity to take over part of the other banks' markets, and to provide technology and a platform for providing services to other banks through API management (Botta, Digiacom, Höll. & Oakes, 2018). Rana, Duncan, Peers, Kohil& Phelps in the "PSD2 and Open Banking - Using Regulation to kick-start banking transformation" states that PSD2 and the open banking framework can be improved to create new business models and revenue streams for banks. They see innovation and growth scenarios for the banking and capital markets as: opening up new revenue streams for banks by selling access to certain of their own data or core banking systems, using data from other banks, so that banks can become aggregators for customers with more financial ties, and access additional customer data at the point of their generation, which would allow the bank to advance its risk analysis (Rana, Duncan, Peers, Kohil& Phelps).

3.3.Potential strategies

In order to maintain their position in the new PSD2 reality, banks will need to adapt their business and business models. Many banks will lose control of the customer interface, and as a result, most banks will follow a defensive stance "Wait and see" which is the opposite of risk. Unlike most European banks, several innovative, digital-challenger banks are not waiting, but have embraced open banking, open APIs and follow strategies aimed at winning the leading role in the future (Forester, Rolfe & Brown, 2017).

Broderick & Palm (2018) identified two strategic issues that banks need to address in order to cope with PSD2 challenges: their position in the value chain and their customer service portfolio.

Banks have two choices in terms of positioning in the value chain: to allow TPPs to offer AIS and PIS to banking users, or to develop these advanced services themselves and compete directly with TPPs for customers. In terms of service portfolios, banks also have two choices: to provide a small transaction services portfolio containing only PSD2 compliant payment and information services, or to provide a larger portfolio of services that go beyond payment (e.g. digital identity services, money lending, etc.). By choosing the answer to these questions, banks actually choose one of four potential strategies:

1. Strategy 1 - “Resign”. The minimum approach in which banks passively wait to see what PSD2 will bring while doing the least they need to do - complying with the new regulation by opening specific APIs and giving third party vendors access to their clients' accounts. This can prove to be a strategy by which banks give significant assets and risk losing in quantity and closeness to customers.
2. Strategy 2 - “Distributor”. This strategy is based on developing more advanced client information (more advanced APIs) that goes beyond regular payment and billing notification services. Banks are given the opportunity to collaborate with TPPs, which in turn can create new, more useful customer services based on shared datasets.
3. Strategy 3 - “Manufacturer”. This strategy allows banks to compete with third-party providers by becoming a TPP themselves and actively seeking new opportunities from PSD2. By choosing this strategy, banks will be able to gain deeper insight into information posting, customer identity information and leverage new

financial services such as personal financial planning management services, real-time financial advisor services, digital identity services (authentication, online contracting) etc.

4. Strategy 4 - “Open banking ecosystem”. This strategy combines all the previous strategies and focuses on "banking as a platform" that enables banks to transform their portals into a data ecosystem, creating partnerships across the entire TPP network. These partnerships would allow banks to use part of the customer data stored on TPP systems as well as provide new products and services owned by TPPs on the bank's online portal (Broderick & Palm, 2018).

The optimal strategy is probably a combination of the aforementioned models under which banks will offer infrastructure and banking products to customers, both through a third party interface and through their own interface that could also offer third party products / services. Banks could set up an ecosystem of different providers to provide an interface through which users could complete all stages of the purchasing process. Some banks may choose to focus entirely on providing the aforementioned services and to exit traditional banking (Deloitte LLP, 2017)

3.4.Examples of new business models

By aligning with the PSD2 rules, certain banks have incorporated new features into existing infrastructure, while several banks in less developed markets, such as those in the CEE, have invested in new core banking systems several years later, giving them immediate cost advantage and the ability to easily add of new technologies into existing systems (Kuszeowski, 2018).

The Spanish BBVA Group launched its Open API market in May 2017 and made eight of its APIs commercially available to businesses, startups and developers worldwide. Also in June 2017, the Berlin Group, an interoperable coalition of European payments banks and payment processors, announced a unique standard for accessing API bank accounts to comply with the new PSD2 regulation regarding XS2A. In parallel with the internal platforms of innovative bank companies, various open banking platforms and partnerships with TPPs have emerged in the European market, like Buddibank, Figo, N26, the Open Bank Project, Satispai, Clearbank etc. They create API-driven, customer-focused and data-driven business models. New open banking trends in Europe include combining banking applications with payment services and value-added services from TPP for clients. Inter alia, open banking services managed by FinTechs and banks in Europe include: Barclays banking application "Pingit" (for payment of bills and P2P transfers), Smart Fridge (authorization of application for smart refrigerator for repeated automatic ordering and payment of groceries up to 50 €), FinanceApp (cash flow forecasting and accountancy based financial advice) etc. (Forester, Rolfe & Brown, 2017).

4. Conclusion and future work

PSD2 introduced and adequately regulated new players in the financial market (PISP, AISP), and facilitated the emergence of new financial services (PIS, AIS). It has expanded the scope of payments from EU / EEA domestic currency payments only to payments in all currencies if at least one of the participants is located in EU / EEA territory. In addition, it has established new rules for licensing third-party providers, and restricted financial service providers from accessing users' accounts with their express permission. The introduction of Regulatory Technical Standards has improved the security of payment processing using strong

customer authentication rules (Forester, Rolfe & Brown, 2017). Opening the banking market with mandatory APIs, which obligate banks to provide third parties who want to enter the market with information about their customers, will lead to faster digitization and innovation of the market, but it also puts banks in a difficult position. They have to choose an appropriate strategy to respond to threats as soon as possible and try to seize opportunities in the digital environment. According to the author, there are many more threats than opportunities when viewed from a bank perspective. COVID-19 pandemic situation will permanently change consumers' behaviors and accelerate transition from cash to electronic payment (Global Data, 2020). E-retailers, therefore, have a huge opportunity for long-term growth. Also, FinTech's and TechFin's have an opportunity to be mediators among customers and banks. Banks, on the other hand, become average participants compared to the dominant role they previously held.

Deloitte survey of the situation in the CEE financial market has shown that banks see the greatest danger in FinTech and TechFin companies and expect the largest PSD2 impact on the market in the retail and SME segment, in payments, day-to-day banking and customer loans. The so-called Challenge banks tend to view PSD2 as a greater threat than Minimalists, so they follow a collaborative strategy on the market, separating a higher level of budget, both for complying with the law and creating a strategy for market entry. On the other hand, Minimalists have a smaller budget focused mainly on compliance with the law, and most of them are still in the phase of assessing the market situation and applying a defensive approach. In authors' opinion, banking market is already unstable in recent years. The pandemic has only exacerbated the already deteriorating banking conditions formed under the PSD2 directive, so it will be even more difficult for banks to comply with its provisions.

Banks that choose to develop advanced services compete directly with TPPs for customers, where they have strong competition, while banks that choose to be providers of customer information to TPPs have a worse role in the market than in the past. The future will tell whether cooperation between banks and TPPs may be the optimal solution.

This study is based only on the analysis of findings from the relevant available literature, so the topic for the future work can be an adequate empirical research.

References:

- Botta, A., Digiaco, N., Höll, R. & Oakes, L. (2018). PSD2: Taking advantage of open-banking disruption. Retrieved January 25, 2020, from: <https://www.mckinsey.com/industries/financial-services/our-insights/psd2-taking-advantage-of-open-banking-disruption#>
- BEUC. (2020). Retrieved June 08, 2020, <https://www.beuc.eu/publications/covid-19-cannot-be-excuse-delay-making-online-payments-safer/html>
- Bric, P., Maewski, D., Scott, A. & Gallo, V. (2018). European PSD2 Survey – Voice of the Banks, *Deloitte Central Europe*. Retrieved January 20, 2020, from: <https://www2.deloitte.com/content/dam/Deloitte/ce/Documents/financial-services/ce-deloitte-european-psd2-voice-of-banks-survey-2018.pdf>
- Broderick, M. & Palm, R. (2018) PSD2 - A Catalyst for the Future of Retail Banking - Banks' strategies to reach a competitive advantage from PSD2 in SZE. *Eden.KTH royal Institute of Technology, School of Industrial Engineering and Management*. Retrieved January 19, 2020, from: <http://www.diva-portal.se/smash/get/diva2:1257027/FULLTEXT01.pdf>
- Choi, G. & Park, M. (2019). Reconnecting the Dots for the Payment Service Directive 2 - Compatible Asian Financial Network, *East Asian Economic Review*, vol. 23, (3), 285-309 <http://dx.doi.org/10.11644/KIEP.EAER.2019.23.3.364>
- Eide, J.S.G. & Hallum, S. (2018). PSD2: A Strategic Perspective on Third-Party Payment Service Providers, Master Thesis, *BI Norwegian Business School - campus Oslo*. Retrieved January 15, 2020, from: <https://biopen.bi.no/bitstream/handle/11250/2578906/2040606.pdf?sequence=1&isAlloZEd=df>
- Forester, H., Rolfe, A. & Brown, A. (2017). PSD2 and Europe's Open Banking Mandate – Challenges for Banks and FinTechs, Payments Cards and Mobile Research. *NCR corporation*. Retrieved January 16, 2020, from: <https://www.paymentscardsandmobile.com/wp-content/uploads/2017/09/NCR-PSD2-Report-Final-1.pdf>
- Global data, (2020). Retrieved June 08, 2020, <https://www.globaldata.com/covid-19-will-accelerate-growth-of-electronic-payments-according-to-globaldata/>
- Kuszewski, P., (2018). Impact of the PSD2 directive and strategic use of costly innovation. Working paper, DOI: [10.13140/RG.2.2.24263.55207](https://doi.org/10.13140/RG.2.2.24263.55207)
- Mansfield-Devine, S. (2016). Open banking: opportunity and danger, *Computer Fraud & Security*, 8-13. [https://doi.org/10.1016/S1361-3723\(16\)30080-X](https://doi.org/10.1016/S1361-3723(16)30080-X)
- Możdżyński, D. (2017) The Conceptions of New Payment Methods Based on Revised Payment Services Directive (Psd2), *Information Systems in Management (2017) Vol. 6 (1) 50-60*, DOI: [10.22630/ISIM.2017.6.1.5](https://doi.org/10.22630/ISIM.2017.6.1.5)
- Noctor, M. (2018). PSD2: Is the banking industry prepared? *Computer Fraud & Security*, 9-11. [https://doi.org/10.1016/S1361-3723\(18\)30053-8](https://doi.org/10.1016/S1361-3723(18)30053-8)
- Omarini, A., E. (2018). Banks and Fintechs: How to Develop a Digital Open Banking Approach for the Bank's Future, *International Business Research*; Vol. 11, No. 9; Published by Canadian Center of Science and Education, doi:10.5539/ibr.v11n9p23
- Politou, E., Alepis, E., Patsakis, C. (2019). Profiling tax and financial behaviour with big data under the GDPR, *Computer law & security review* 35 (2019) 306–329
- Rana, S., Duncan, A., Peers, R., Kohli, A & Phelps, D. PSD2 and Open Banking Using regulation to kick-start the transformation of banking. Retrieved January 25, 2020, from: https://info.microsoft.com/rs/157-GQE382/images/PSD2%20and%20Open%20Banking%20Whitepaper_Microsoft_Avanade_Accenture.pdf
- Saarnilehto, I. (2018). Problems and possibilities of the payment services directive (PSD2), *ProCIEdings of the Seminar in Computer Science: Internet, Data and Things (CS-E4000)*, 71-82.

Vasiljeva, T. & Lukanova, K. (2016). Commercial Banks and Fintech Companies in the Digital Transformation: Challenges for the Future, *Journal of Business Management*, 2016, No.11, 25-33

Wolters, P.T.J. & Jacobs, B.P.F. (2018). The security of access to accounts under the PSD2, *Computer Law & Security Review: The International Journal of Technology Law and Practice*, <https://doi.org/10.1016/j.clsr.2018.10.005>

Arxan. (2020). Retrieved August, 27, 2020, from: <https://www.arxan.com/>

UK Finance. Retrieved January 18, 2020, from: <https://www.ukfinance.org.uk/system/files/Frequently-Asked-Questions-on-PSD2-and-Open-Banking.pdf>

The FinTech Times. Retrieved January 26, 2020, from: <https://thefintechtimes.com/european-fintech/>

Deutsche Bank. Retrieved January 22, 2020, from: [https://cib.db.com/insights-and-initiatives/white-](https://cib.db.com/insights-and-initiatives/white-papers/are_you_PSD2_Ready_a_guide_to_the_latest_information_and_sources_of_support.htm)

[papers/are_you_PSD2_Ready_a_guide_to_the_latest_information_and_sources_of_support.htm](https://cib.db.com/insights-and-initiatives/white-papers/are_you_PSD2_Ready_a_guide_to_the_latest_information_and_sources_of_support.htm)

Deloitte. Retrieved January 24, 2020, from: <https://www2.deloitte.com/rs/en/pages/financial-services/articles/deloitte-european-psd2-surveys.html>

Deloitte. (2018). Retrieved January 24, 2020, from: <https://www2.deloitte.com/content/dam/Deloitte/ce/Documents/financial-services/ce-psd2-voice-of-the-customer-survey-2018.pdf>

Deloitte LLT. (2017). Retrieved January 24, 2020, from:

<https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/financial-services/deloitte-uk-open-banking-how-to-flourish-in-an-uncertain-future.pdf>

ZEforum. Retrieved January 20, 2020, from: [http://www3.ZEforum.org/docs/Beyond_Fintech_-](http://www3.ZEforum.org/docs/Beyond_Fintech_-_A_Pragmatic_Assessment_of_Disruptive_Potential_in_Financial_Services.pdf)

[_A_Pragmatic_Assessment_of_Disruptive_Potential_in_Financial_Services.pdf](http://www3.ZEforum.org/docs/Beyond_Fintech_-_A_Pragmatic_Assessment_of_Disruptive_Potential_in_Financial_Services.pdf)