

# Fintech in the financial services market – opportunities and threats. Case study of Poland

Marek Szczepański  
Poznan University of Technology, Poland  
marek.szczepanski@put.poznan.pl

**Abstract:** *Fintech is increasingly important and potentially the most rapid change in financial services sector, changing the way financial services firms operate and transforming debt and equity markets, payments, credit assessment, regulatory compliance, personal finance and many other facets of financial services. The aim of the article is to analyze the impact of Fintech on the financial services market in Poland in the 21st century, with particular emphasis on the banking and insurance sector. The author intends to answer the question whether modern solutions proposed by IT companies in the field of payment processing, data collection and processing in Big Data technology and financial consulting constitute competition, or are complementary to financial services offered by banks and insurance companies, and to identify opportunities and threats for the further development of Fintech in Poland.*

**Keywords:** FINTECH, FIANCIAL MARKET IN POLAND, DETERMINANTS, OPPORTUNITIES, THREATS.

## 1. Introduction

Financial Technology (abbreviation: Fintech or FinTech) refers to use of software and digital platforms to deliver automated and improved financial services to consumers (individuals, companies and institutions). Fintech denotes companies or representatives of companies that combine financial services with modern, innovative technologies. As a rule, new participants in the market offer Internet-based and application-oriented products. This new, digital tools are sources of product and process innovations in financial sector, and often challenge and disrupt established business models (for example in banking industry, insurance, mutual investment funds and asset management companies) by creating new and more efficient means of service delivery (multi-channel, digital and mobile access), as well as new, more tailored products.

While innovation in finance is not a new concept, the focus on technological innovations has increased significantly. Fintech solutions that make use of Big Data analytics, artificial intelligence and blockchain technologies are currently introduced at an unprecedented rate. Fintech is increasingly important and potentially the most rapid change in financial services sector, revolutionising the way financial services firms operate and transforming debt and equity markets, payments, credit assessment, regulatory compliance, personal finance and many other facets of financial services.

Fintech is transforming and impacting the financial services industry in many ways – in terms of operations, customer experience, regulations [1]. New ways of communication of the customer with their bank, insurer or other financial institution, additional functions in mobile banking and surprisingly simple payment methods (eg. payments by phone or watch) - these are just some chosen areas of everyday contact between technology customers and products from the Fintech sector [2]. Fintechs have entered a new stage of their evolution: from competitor to trusted partner of traditional financial institutions. Through partnerships with traditional financial institutions, Fintechs can scale their technology and access growth capital, and financial institutions can improve product offerings, increase efficiency, and lower costs. These are all goals with special relevance to low-income customers, who look for products that are more convenient, less expensive, and higher quality.

Fintech companies can be categorized into the following 12 types, based on the services offered:

1. Debt financing: Lending services without the need for collateral and borrower evaluation
2. Transactional services/currency trading: Similar to that of banks but at a lower cost
3. Payment methods: Electronic means of payment
4. Crowdfunding /crowd lending: Raising funds for the purpose of investment
5. Cryptocurrencies and blockchain: Cryptocurrencies as a digital means of exchange as well as the technology they are based on (blockchain)
6. Insurtech: Companies that apply technology to the insurance sector

7. Online customer identification: To identify people remotely through electronic means

8. Big data: Entities that generate added value with the collection and management of data, and intelligent analysis of data (including Artificial Intelligence) and generation of services using this data

9. Financial infrastructure: Improving existing technology for financial service provision

10. Advice and financial management: Investment advisory services, management services or trading platforms

11. Personal financial management: Comparison websites for financial products, and personal finance optimization services

12. Neobanks and challenger banks: Online, fully-digital (branchless) banks using alternate traditional models, e.g. using smartphone apps for account management, or using social networks to establish relationships with clients.

The Fintech sector develops worldwide, but the pace and the direction of this development are different in each country. According to the “Global FinTech Report” of PWC (2019), almost half of all firms in both financial services and technology, media and communications (TMT) have fully incorporated FinTech-based products and services into their strategic operating models [3].

According to the “Pulse of Fintech H2’21 report [4], global fintech investments in 2021 recorded US \$ 210 bn (with 5,684 deals).

It should be noted that in addition to the opportunities related to the development of the Fintech market, there are also new threats, especially related to operational risk (cybercrime, IT system failures, imperfections related to the increasing use of Artificial intelligence (AI) in the area of financial services). A separate, new type of risk are hacker attacks used in military technology (eg Russia's war in Ukraine), but also a serious threat to civil infrastructure, and for the financial services sector and its customers.

In the first part of the article, a review of the literature on development of Fintechs will be presented, as well as the classification of the main segments of the Fintech market in Poland and the main types of operational risk relevant to this market. The second part will present the overview of the Polish Fintech market. In the third part results of research on the opportunities and threats of this market in Poland will be presented and discussed. In final part conclusions will be formulated.

In the research, which results are presented in this paper, the methods of analysis and synthesis, description and explanation as well as the method of critical analysis of the literature were used.

## 2. Literature review

Fintech issues are of increasing interest to researchers not only in technical sciences, but also in management sciences, economics and even the humanities. There is nothing surprising in this, as the next civilization breakthrough related to the introduction of Industry 4.0 also covers the financial services sector, which has a huge impact on the socio-economic development, as well as on the lifestyle of consumers around the world. The investigation of drivers and barriers of Fintech development requires an interdisciplinary approach. In this short literature review, only selected publications

in the field of management sciences and economics will be considered.

The researchers representing management sciences are interested in the Fintech business models [5-7]. The analysis of the 629 FinTech business model papers in the Web of Science database indicates that currently the most hot-topic in FinTech research are mobile payment, microfinance, peer-to-peer lending platform, and crowdfunding. The research shows that the traditional and new-finance co-exist and cooperate one with another, instead of competing [8-9].

The greatest advantages of the products offered by Fintech sector indicated in the literature [8-9] are:

- reduction of transaction costs (in comparison with traditional banking, insurance or asset management operations),
- enabling real-time settlements (eg. on-line money transfers or payments);
- the possibility of investing in different categories of financial and real assets (commodities, Real Estate, raw materials etc.) via special on-line trading platforms and instruments, available also for individual customers, not only for corporate clients.

Another subject of research is risk management framework for Fintechs. It is important for financial market supervisors (state institutions) to use such a framework to monitor innovative products proposed by Fintechs, and to use advanced supervisory technology (SupTech). Also Fintechs need clear regulations and support to improve their competitiveness. Many authors analyzing Fintech market came to conclusion that there is a need to transform compliance and supervision to develop uniform, market-driven risk management tools, which could help to mitigate the barriers between Finches and supervisors. Especially operational risk management is important for the current and future development of Fintech sector. Risk management models and tools are needed, which are relevant for the main three technologies used by Fintechs [10]:

- 1) **Big data analytics**, with its application to peer-to-peer lending, with main risks arising from credit risk, and systemic risk;
- 2) **Artificial intelligence (AI)**, with its application to financial robo-advice, with main risks arising from market risk and compliance risk;
- 3) **Blockchain**, with main application to crypto-assets, with main risks arising from fraud detection, money laundering risk, IT operational risk and cyber risks.

Fintechs which use Artificial Intelligence I are exposed to new types of AI (see table 1).

**Table 1.** New operational risks triggered by AI

People Risk	Process Risk	IT System Risk
- Risk of loss authority	- Risk of algorithms (bias)	- Erroneous conclusions and/or false positives (IT system)
- Risk of loss control	- Risk of algorithms: feedback	- Risk of cyberattack
- Risk of losing job (substitutes by AI)	- Risk of algorithms: abuse	
- Risk of losing skills		

Source: [11]

Electronic, automated payments can be used for different purposes - also for money laundering or even terrorist financing. Anti-money laundering (AML) and terrorist financing (TF) in financial institutions are regulated by the Fourth Anti-Money Laundering Directive of European Union (AMLD4). This directive has been implemented in Poland also for Fintech sector. It integrates the AML/CTF (counter terrorist financing) system with the international money laundering (ML) and terrorist financing standards adopted by the Financial Action Task Force (FATF). Poland is a member of the FATF.

Nevertheless, many issues related to dynamic development of Fintech sector in Poland have not been regulated, and Polish

Supervision Financial Authority (Komisja Nadzoru Finansowego, abbreviation: KNF) has not enough legal and IT tools to effectively control this market [15]. The working group of KNF has identified changes in legal environment of Polish Fintech sector (see table 2).

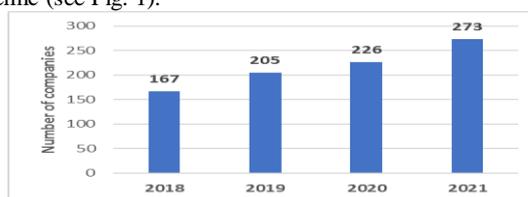
**Table 2.** Examples of required changes in legal environment of FinTech identified by the KNF working group

Required action	Expected outcome
Require regulation	new instruments for start-up funding
	compulsory publication of rules interpretations for the KNF
	creating a mechanism to review the KNF interpretation
	legal and business advice for new transborder payment services providers
	national framework for crypto assets including taxation;
Regulation change	possibility to dematerialize shares in companies
	clarification of rules for financial instruments digitalization
	possibility to tokenize documents such as cheques,
	bills of exchange, waybills or bills of lading
	allowing for digital document form to substitute written form
	decreasing length of getting a license for payment services process;
	excluding small payment institutions from obligation
Interpretation/ practice change	of data processing in computing cloud
	precise interpretation of the term "innovativeness" by the KNF
	provide possibility for new securities creation
	robo-advice – clarification whether there is a need for regulated
	outsourcing requirements for the algorithm provider

Source: [12]

**Overview of the Fintech sector in Poland**

Poland is the biggest Fintech market in Central and Eastern Europe, with an estimated value of €856 million (the whole estimated value of innovative financial solution in East and Central Europe respectively: €2.2 billion [15]). The number of Fintech companies has been increasing systematically, also during COVID 19 pandemic (see Fig. 1).



**Fig 1.** Number of Polish Fintech companies operating in Poland from 2018 to 2021

Source: [13]

The Map of Polish Fintech sector included 273 Fintechs and fintech projects on 2021. Additionally, 39 companies were included in the foreign section, which covers foreign entities providing their modern financial services to Polish clients. In total the Map of Polish Fintech 2021 includes 312 companies [14-15]. The most represented sector on the Map of Polish Fintech 2021 are Digital Payments. 66 Fintechs provide various payment services, with expected total value of US \$ 50.40 bn in 2022. In Digital Payment segment, the number of users is expected to amount to 21.35 mln. users by 2026 [16].

The second on the list is the „software providers” sector. Twenty Fintechs provide corporate financial management services and 17 - personal finance services. The same number of Fintechs, other than lending companies, provide various services in the area of loans and credits. Insurtech deserves special attention. In 2020 the Map included eight entities classified as Insurtechs. In 2021 there are twice as many, i.e. 16. It is a significant growths.

Most of services provided by Fintech companies are offered to other companies (B2B) or to banks. Only half of Fintech ventures dedicate their services/products to individual customers.

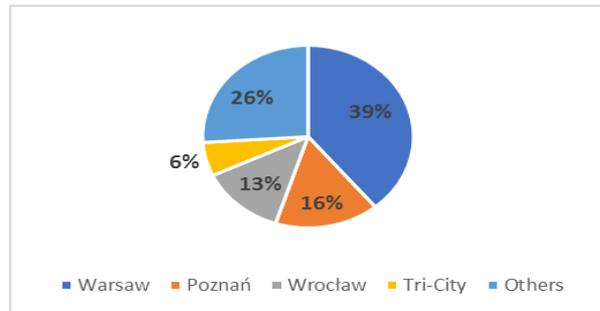
The main fields of activity of Polish Fintechs can be also classified in different way (see table 3)

**Table 3. Polish Fintechs: fields of activity**

Payment	Mobile payments Online payments Mobile transfers Other form of payments
Analytics	Big data Data (business) analytics Big data analysis Machine learning Artificial intelligence used for automated advice Chatbots
Banking infrastructure	User interface Processing enhancement Infrastructure technology Software companies in the financial sector
Distributed ledger technology	Cryptocurrency Crowdfunding Invoice trading
Deposit and lending	Crowd investing Crowd lending Invoice trading
Investment management	Roboadvisor Social trading Hybrid models Advice supported Digital investing
InsureTech	Software technology in insurance
Accountech	Software companies in the financial sector

Source: [16]

The biggest center of Fintechs is Warsaw, home to nearly 45% of startups in the country, and also a hub of financial technology in the region. Other important Fintech centers are Poznań, Wrocław, so called Tri-city (Gdańsk-Gdynie-Sopot, on Baltic Sea), and other, smaller destinations (see fig. 2).



**Fig. 2. Participation on the map of Polish Fintech market**  
Source: Cashless.pl

The Global Financial Centres Index (GFCI) ranks capital of Poland as the 12th most competitive major Financial Centre in CEE, and 45th in the world. Just 9 years ago (2013) the term “Fintech” was not widely known in Poland. But local financial institutions (such as MBank or Multibank) were one of the most innovative in Europe. It hasn’t changed since then.

The development of Fintech sector in Poland takes place in conditions specific to local market. It should be noted that there are some differences between needs and capabilities of Polish consumers of financial services in relation to residents of other economically developed countries. Compared to high-income countries, Polish adults less often save money and less often keep their savings at a financial institution, although a positive saving trend can be observed over time. Similarly, borrowing money is less popular in Poland than in other high-income countries, for example Euro Area countries (see table 4).

**Table 3. Chosen financial inclusion indicators in Poland**

Indicator	Poland	Euro Area
Personal Savings (as % of GDP)*	1.23	13.34
Households Debt to income**	55.9	96.79

\*Data from December 2021 \*\* Data from December 2020  
Source: [17]

Fintechs are developing and expanding in co-operation with traditional financial institutions. The banks are good examples of ventures that are driving innovation. They constantly invest in improvements and novelties in various areas, such as modern sales channels (including online channels), remote client service technologies, digitalization of traditional branches or new payment methods.

One of the sources of dynamic development of Fintech sector in Poland is strict co-operation with traditional banking sector. For example, in 2017 five Polish banks took part in fintech Alior Bank projects (see table 5).

**Table 5. Six Polish banks conducted an assessment of Fintech projects**

Bank	Fintech project	Scope of activity
Alior Bank	HugeThing.vc	investors and finally commercialization of projects with the greatest potential. Alior Bank is the partner of the current fourth edition of the accelerator, which is looking for solutions related to blockchains, biometrics, and artificial intelligence.
ING Bank Śląski	Akcelerator ING	ING accelerator was created to develop innovative ideas and transform them into products and services attractive to customers. This is a place where teams work

		like startups, with the support of ING Group experts and external experts (eg service designer, growth hacker). Employees who work in the accelerator are posted there for 100% of the time.
mBank	mAkcelerator	The mAccelerator is a venture capital fund that manages assets worth over EUR 50 million. It specializes in investments in the rapidly growing business in the early stages of development operating in different sectors of the economy. It focuses on unique technological solutions that have the potential to revolutionize entire areas of the economy
PKO BP	Let's Fintech	Technology Enterprise Forum with the support of PKO Bank Polski serves to select and support the most interesting technological startups.
Pekao SA	Social StartUp	Social StartUp is a program in which the most promising and innovative social enterprises selected in the competition receive advice and development grants. It is implemented by the Ashoka Foundation and UniCredit Foundation, in cooperation with Bank Pekao SA
Millenium	317 G Coworking	Launched in cooperation with the Warsaw School of Economics, the Coworking Center is a space for students who have their own start-ups or plan to open them. This is the first center of this type at the Warsaw School of Economics and the only place adapted for this at the university.

Source: own elaboration

One of the greatest assets of the Polish Fintech sector is a human capital and highly skilled IT professionals. The great potential has been already identified by leading technology providers. In 2015 Google opened its Campus Warsaw which was the 5th in the world and 1st in the CEE region. Another incubator was opened by Microsoft in 2017.

Examples of Fintech solutions are secure mobile applications<sup>29</sup> for banks and online services (loans) or online factoring, in which the entire procedure and assessment of the customer's credit (payment) ability is carried out electronically and remotely, and entities offering these services use, among other things, databases of economic information offices, social networking sites such as Facebook, LinkedIn or Instagram.

What is interesting, mobile device users run banking operations even more frequently used than average in Europe (see fig. 3).

Source: Report on the work of the Financial Innovation Working Group (FinTech), KNF (The Polish Financial Supervision Authority) 2017.



Fig.3. The use of mobile devices for financial operations (survey) Appendix: the question has been asked to mobile device users Source: [18] Finance Barometer ING, 2017

In recent years Fintech development mainly centered on co-operation with the banking industry. But other financial institutions, especially insurance companies, also introduced many new products in IT systems, to improve customer service and internal operations. One of such examples are special apps (prepared in co-operation with Insurtechs) which facilitate the entire insurance process. Mobile functionalities are also used in private health insurance, to facilitate making doctors' appointments. This kind of service is shared through the mobile app of PZU (the state-owned leading insurer in Poland).

The most important fintech entities that have their headquarters in Poland are: PayU, Blue Media), Currency One, Finanteq, VoicePIN, ZenCard. Examples of foreign fintech entities are Revolut30 and N26. But the most popular became Blik mobile payment system offered by a dozen banks in Poland. Online payments are its most popular functionality (75% of all Blik operations). In 2018 users made 100 million online transactions with Blik, with total value of 12 billion zloty (2.8 billion euro). already in 2019 Polish payment system Blik surpassed cards (MasterCard, VISA) online payment [16]. While transactions carried out via BLIK, DotPay, Przelewy 24, PayPal and other leading payment systems are relatively safe, well documented, and there have been no high-profile cybercrimes related to them in Poland, There are much more frequent and serious attempts to phishing and cybercrimes related to unauthorized access via internet to bank accounts and bank cards.

### Results and Discussion

Analysis of statistical data, reports of commercial companies analyzing Fintech market in Poland and literature review allow to identify the most important opportunities and threats to the development of Fintech sector in Poland (see table 6).

Table 5. Opportunities and threats to the development of Fintech Sector in Poland

Opportunities	Threats and risk factors
Mutual co-operation with banks	Legislation favors banks
Available technology: increasing number of mobile phone users and secure Internet services	smartphone below EU average
Trust in banking system above the average in EU	The overconfidence exposes users of Fintech services provides for banks to cybercrimes
Big home demand. Openness of Polish citizens to financial innovations.	Problems with finding new customers.
Positive trends in education	Weak co-operation between science and industry

Innovation Hubs in Polish cities	Regulations not sufficient for Fintechs, still high level of bureaucracy, especially relevant for start-ups
Increasing number of IT, finance and economic students	Poland has not effective strategy of keeping and attracting talents
Increased demand on Fintech services	Problems with start-up financing, especially with venture capital

Source: [9] [15-16], own elaboration

The outbreak of the COVID-19 pandemic in March 2020 undoubtedly provided many opportunities for the development of the Fintech sector. For example, it took only two weeks to increase the amount of contact-less payments without a PIN from 50 to 100 PLN - after the two-years discussion. The results of the last surveys show that Fintechs in Poland, especially start-ups, face many challenges, such as:

- the lack of clear regulations;
- the availability to find skilled staff/experienced managers;
- finding customers,
- data cost,
- brain drain of most talented IT experts to other countries (mostly West Europe, USA).

But Fintechs have also many advantages in relation to traditional financial institutions, which became even more transparent in times of COVID pandemic, such as:

- increased demand on cashless payment,
- increased demand on on-line financial services,
- more flexibility of Fintechs,
- innovative potential and human capital of IT workers.

When it comes future prospects for development of Fintech sector in Poland, many issues remain open. For example, in which direction further regulation of this market should go in order to avoid overregulation and bureaucratization. Another important subject for discussion (in science and public policy) is creation and development of economical and institutional conditions for acceleration of knowledge transfer from scientific institutions (universities, research institutes) to Fintech sector and better commercialization of new, innovative research projects and achievements.

## Conclusions

The Polish Fintech market develops systematically and dynamically, in spite of risk identified in this articles (including lack of regulations and crisis conditions connected with COVID 19 pandemic and new, not fully estimated threats caused by Russian war in Ukraine, the neighbor country of Poland). Most of the companies operating in Fintech sector are start-ups, for which access to capital and favorable tax conditions are important, not only at the stage of their creation, but also for their further development. So far, the activity in the field of digital payments shows greatest dynamics. But also other areas of Fintech activity (specified in table 3) have great development potential. This applies especially to Fintechs co-operating strictly with banks and insurance companies (Insurtechs).

## References

- [1] KPMG (2018). The Pulse of Fintech – H2' 2018. 2018 Bi-annual analysis of global investment trends in the fintech sector. Accessed 10 April 2021, <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2018/07/h1-2018-pulse-of-fintech.pdf>
- [2] Nicoletti, B. (2017). *The Future of FinTech: Integrating Finance and Technology in Financial Services*. Palgrave Macmillan, Rome, 62-73.
- [3] PWC (2019). Crossing the Lines: How FinTech is Propelling FS and TMT Firms Out of Their Lanes. Global FinTech Report, <https://www.pwc.com/gx/en/industries/financial-services/assets/pwc-global-fintech-report-2019.pdf>.
- [4] KPMG (2022). Pulse of Fintech H2.21'21., <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2022/02/pulse-of-fintech-h2-21.pdf>.
- [5] Laiwi Laidroo & Mari Avarmaa (2020) The role of location in FinTech formation, *Entrepreneurship & Regional Development*, **32**:7, 555-572.
- [6] Lee, I., and Y. J. Shin (2018). Fintech: Ecosystem, business models, investment decisions, and challenges. *Business Horizons* **61**: 35–46.
- [7] Liu, J., X. Li, and S. Wang (2020). What have we learnt from 10 years of fintech research? A scientometric analysis. *Technological Forecasting and Social Change*, **155**: 1-22 <http://www.sciencedirect.com/science/article/pii/S0040162519321869>.
- [8] Bömer, M., and H. Maxin (2018). Why fintechs cooperate with banks—Evidence from Germany. *Zeitschrift für die Gesamte Versicherungswissenschaft* **107**: 359–86.
- [9] Kliber A., Będowska-Sójka B., Rutkowska A. and K.Świczynska (2021). Triggers and Obstacles to the Development of the FinTech Sector in Poland, *Risks*, **9**: 1-27. Accessed 10 April 2022, <https://doi.org/10.3390/risks9020030>.
- [10] Giudici P. (2018). Fintech Risk Management: A Research Challenge for Artificial Intelligence in Finance, *Frontiers of Artificial Intelligence*, **1**:1-6.
- [11] Fedorus M. (2022), Examining the implications of AI Solutions for the operational risk in enterprise and/or in financial institutions, manuscript, not published (to be published).
- [12] KNF (2018) Report on The Activities of The KNF And The KNF Board in 2018, [https://www.knf.gov.pl/knf/en/komponenty/img/ANNUAL%20REPORT%20OF%20THE%20ACTIVITIES%202018\\_66983.pdf](https://www.knf.gov.pl/knf/en/komponenty/img/ANNUAL%20REPORT%20OF%20THE%20ACTIVITIES%202018_66983.pdf)
- [13] Statista(2022). <https://www.statista.com/statistics/1246490/poland-number-of-fintech-companies>.
- [14] Vlaanderen (2018). Fintech in Poland. Accessed 05 April 2022, [https://www.flandersinvestmentandtrade.com/export/sites/trade/files/market\\_studies/2018-FinTech-in-Poland.pdf](https://www.flandersinvestmentandtrade.com/export/sites/trade/files/market_studies/2018-FinTech-in-Poland.pdf)
- [15] The map of Polish fintech (2021) Casless.pl. Accessed 15 April 2022, <https://www.casless.pl/report/mapa-polskiego-fintechu-2021-ang.pdf>.
- [16] FinTechs in Poland (2022). Insides, Trends and Perspectives, Poznan University of Economics and Business, QuantFin, [https://www.researchgate.net/publication/341726862\\_FinTechs\\_in\\_Poland\\_Insights\\_Trends\\_and\\_Perspectives](https://www.researchgate.net/publication/341726862_FinTechs_in_Poland_Insights_Trends_and_Perspectives)
- [17] Tradingeconomics.com (2022). <https://tradingeconomics.com/country-list/personal-savings>, <https://tradingeconomics.com/country-list/households-debt-to-income>
- [18] ING (2017). Finance Barometer ING 2017.