IBIMA Publishing
Communications of International Proceedings
https://ibimapublishing.com/p-articles/38DigECO/2021/38111921/
Vol. 2021 (37), Article ID 38111921

The Popularity of Financial Services on The Fintech Market in Poland and The Problem of Financial Inclusiveness

Marcin SURÓWKA*
Cracow University of Economics, College of Economics, Finance, and Law, Institute of Finance, Department of Corporate Finance, Ul. Rakowicka 27, 31-510 Cracow, Poland, wyrobekj@uek.krakow.pl

Katarzyna ŁACH
Cracow University of Economics, College of Economics, Finance, and Law, Institute of Finance, Department of Corporate Finance, Ul. Rakowicka 27, 31-510 Cracow, Poland, wyrobekj@uek.krakow.pl

Correspondence should be addressed to: Marcin SURÓWKA; wyrobekj@uek.krakow.pl

* Presented at the 38th IBIMA International Conference, 23-24 November 2021, Seville, Spain

Abstract

The aim of the article was to examine the degree of penetration of Polish society by FinTech enterprises, with particular emphasis on the elderly and people living in the countryside or in small towns. The results of the research suggest that in the case of Poland it is difficult to talk about the inclusive nature of FinTech services, because the elderly and people living far from large cities have not heard about FinTechs at all, or if they have heard, they do not use them. According to Polish Central Bank (Ceglarz (2021)) the same groups of people often do not have a current account at the bank. There are municipalities in Poland where there is not a single ATM. 2.3 million citizens live in such areas (Ceglarz (2021)).

Keywords: FinTech, inclusiveness, Poland

JEL classification: O33, G10, G21

Introduction

Financial inclusion can be defined as a situation in which people and firms are capable of finding affordable financial services that meet their needs (Dev, 2006; Grohmann et al., 2018). Financial inclusion not only means that a person can participate in the modern economy, but studies suggest that it is positively correlated with literacy, life expectancy, and income per capita (Kodan 2013, Asongu 2016, Guild 2017). Therefore, financial inclusion is often considered a crucial part of sustainable economic growth, and that countries should pay attention to this issue by expanding access to financial services, especially to underprivileged and marginalized groups (Nabi 2013, Guild 2017, Allen et al. 2016, Kefela 2010). The first step to financial inclusion is the current account, which allows to use loans, buy insurance, or run a business (Grohmann et al., 2018). According to the World Bank (2020), 62% of adult people in the world have a bank account (the World Bank, 2020), and in the developing countries, in the poorest 40% of households, less than half of the adults have bank accounts (the World Bank 2016, Buckley, Webster 2016, Shankar 2016).

In the digital age, financial, economic, and social inclusion depend on technological inclusion (Grohmann et al., 2018). Revolution 4.0 is also a financial revolution that is being driven by mobile phones and the Internet, as well as the changing expectations of users for financial services. The appearance of FinTechs on the market of virtual financial services, on the

Cite this Article as: Marcin SURÓWKA and Katarzyna ŁACH, Vol. 2021 (37) "The Popularity of Financial Services on The Fintech Market in Poland and The Problem of Financial Inclusiveness", Communications of International Proceedings, Vol. 2021 (37), ISBN: 978-0-9998551-7-1, ISSN: 2767-9640. Article ID 38111921

one hand, means a decrease in the potential or real profits of financial institutions (especially banks), but at the same time supporting financial inclusion by creating innovative products or applying innovative business strategies (Demirgüç-Kunt et al., 2018). They increase the possibilities and financial condition of households and organizations around the world (Kabza, 2018).

The aim of this study will be an attempt to look at the characteristics of FinTech service users in Poland, and in particular, to verify the research hypothesis that FinTech services, especially in the field of payments and transfers, are used by all age groups, both genders and people not necessarily having higher education. This will be indirect evidence of the financial inclusiveness of such services.

Literature Review

Areas of FinTech financial services

Currently, FinTech plays a significant role in specific segments of the financial sector, such as retail payments, asset management, and small loans; however, there is a slow expansion to the credit and customer relationship services sector (Kabza, 2018). Electronic money is of particular importance (Peruta, 2017) as it allows access to financial services via mobile phones (Senyo et al., 2019, Donovan, 2012), as well as the speed of opening an account, which can often be opened within 5 minutes (Mugambi et al., 2014) which is not possible with a traditional bank. Using FinTech services is also more convenient than using banking services (Maurer, 2012).

New technologies that mainly use the FinTech (AI, distributed ledger) market can help lower transaction costs and prime costs for financial service providers, and therefore play an important role in the fight against financial exclusion. FinTechs offer their services via the Internet and mobile phones, they do not offer services in physical bank branches, and they do not need these branches, thanks to which their services are available literally everywhere, where there is access to telecommunications services (Demirgüç-Kunt et al., 2018), they use bots and social networking sites, they use machine learning to score their credit scores, and they also engage in scams.

The entry of FinTechs into the credit market and, more broadly, in obtaining financing sources seems to be of great importance in integrating people into the financial system, as in many countries, micro-enterprises and physical persons have little or sometimes no access to credit. Banks are not very good at assessing the credit quality of small businesses, and individuals often do not have an adequate history or sufficient income. The FinTech sector usually uses other technologies, more innovative, as well as many solutions unknown to banks, for example, lending or crowdfunding platforms or peer-to-peer lending, which allow fundraising, sometimes even in a non-refundable manner. FinTechs, in addition to AI and machine learning (which can give better results when assessing credit risk), also use alternative data sources (e.g., data on the use of mobile devices or e-commerce transaction data) other than information from a credit information bureau, which can also potentially give better effects in the field of risk management and cost reduction. For example, Butler, Cornaggia, and Gurun (2017) and Crowe and Ramcharan (2012) show that in addition to standard financial variables (such as credit scores, employment history, homeownership), P2P (FinTech) platforms also provide nonstandard soft information about the borrowers that is useful for lenders to make credit decisions offering microloans to the users via their phones (Berg, Burg, Gombovic, and Puri (2018)). An excellent example of this advantage may be Wizzit, a company in Sub-Saharan Africa (Allen et al., 2020).

Good evidence confirming the inclusive role of FinTech lending platforms is provided by Schweitzer and Barkley (2017), who found evidence (with the Federal Reserve's 2015 Small Business Credit Survey) that businesses that were denied loans by banks turned to FinTech companies for that credit. This observation was also confirmed by Ahmed et al. (2016), according to whom borrowers would not be able to obtain financing without fintech lending platforms. Similar evidence but for the mortgage market was found by Jagtiani et al. (2019), who showed that borrowers who were denied a mortgage by traditional institutions turned to FinTech companies.

FinTech lenders not only have a higher acceptance rate but also lower costs of lent funds. Jagtiani and Lemieux (2019) used bank stress test data and proved that for the same credit risk of default, FinTech platforms charged lower spreads compared to traditional institutions (Jagtiani and Lemieux (2018)).

Frost et al. (2019) show that FinTech companies quite often begin their life as payment platforms and later expand into other services such as lending, insurance, investment, or savings products. This process is especially visible for countries with less competitive banking systems and more flexible regulations (in such countries, FinTech companies are allowed to use alternative data, which may be considered discriminatory and, therefore, forbidden in some countries). Generally, FinTech lending companies have become very popular in developing countries. Even the World Bank saw the opportunity in this process and began programs aiming to provide microfunding to underdeveloped areas using FinTech firms. A good example is the World Bank's cooperation with Wizzit, which provides microfinance products to people in Sub-Saharian Africa.

FinTechs are also effective in the personal finance management services market, where they offer, among other things, personalized savings and investment products and services (Kabza, 2018). For many customers, it is the first product of this type in their life that they use. FinTechs, thanks to their personalized approach, remove many barriers in accessing such

services. An even more interesting market into which FinTechs are entering is the insurance market, where they offer cheap insurance, the distribution of which would not be profitable if it were implemented differently than in virtual space.

Previous research concerning the inclusive character of FinTech services

There are many studies confirming the positive impact of FinTechs on financial inclusion, but a significant part focuses on theoretical considerations and, for example, analyzes the potential impact of FinTechs on inclusiveness or proposes a framework for further research.

Due to the empirical nature of this study, we will focus on empirical studies based on government data, modeling, surveys, and interviews.

Badruddin (2017), in her publication, showed the positive effects of digitization of rural India's inhabitants and the increase in the number of people with access to banking services. Similar studies concerning Sumatra were carried out by Lubis et al. (2019), who, based on surveys, showed that financial literacy and financial technology increased financial inclusion in society in North Sumatra. Tam and Hanh (2018) showed a similar influence of FinTechs on communities in Vietnam. The impact of the FinTech market on the development of the financial market in Kenya (in particular, the development of mobile money) was described by Tarazi and Breloff (2010), Jack and Suri (2014). Sy et al. (2019) described the impact of FinTech market development on regional development in sub-Saharian Africa. Similar studies on Latin America and the Caribbean were carried out by Berkmen et al. (2019) and Blancher et al. (2019) for the Middle East and Central Asia.

A particularly interesting effect of FinTechs' activities is the equalization of access to financial services between men and women. The research carried out by Sioson and Kim (2019) also based on surveys showed that due to the availability and low costs, FinTechs significantly improved the inclusiveness of women in the following countries: Afghanistan, Bangladesh, PRC, Indonesia, India, Kazakhstan, Kyrgyz Republic, Cambodia, Sri Lanka, Myanmar, Mongolia, Malaysia, Nepal, Pakistan, Philippines, Thailand, Tajikistan.

A very broad analysis of financial inclusion introduced by FinTech firms can be found in the IMF study by Sahay et al. (2020), who presented many statistics showing the effects of FinTechs' activities on a global scale - from the decrease in financial costs, through gender equalization in access to services, to the number of payment transactions carried out through FinTechs. According to Sahay et al. (2020), the main reason for the huge success of FinTech firms in Africa and Asia was mobile money, which was extremely easy to implement because the simplest mobile phones were sufficient to use this technology. Mobile money is now available everywhere, one does not need to look for an ATM, and it's also safer.

What are important factors that determine the level of financial access and inclusiveness? Beck et al. (2007) suggest that the positive factors include the overall level of economic development, the quality of the institutional environment, the degree of credit information sharing, the level of initial endowments, and the development of physical infrastructure. According to the authors, there exist also destimulants: the cost of enforcing contracts and the degree of government ownership of banks, which reduce the abovementioned access to financial services. Kendall, Mylenko, and Ponce (2010) add to the groups of determinants the legal system and religion that may hamper or stimulate the financial sector.

Most significant successes of FinTechs in alleviating financial exclusion

According to the IMF report (Sahay et al., 2020), FinTech continues to grow globally. According to one survey, a weighted average of 15.5% of digitally active customers across six markets had used more than one FinTech product. In Hong Kong, the take-up was found to be significantly higher than average, with almost a third of digitally active customers using FinTech

Fintech companies in the United States have grown to make up 38 percent of the unsecured personal loan market in 2018, from only 5 percent in 2013 (TransUnion 2019). In the United Kingdom, digital loans doubled between 2015 and 2017, and in 2017 they reached US$ 400 billion. In 2017 FinTech credit in China, the USA, United Kingdom made up 98% of the FinTech credit market (Sahay et al., 2020).

According to Statista, in 2010, FinTech companies received 9 billion dollars of global investment, and this number kept rising until the year 2019, where Fintech companies received 215.4 billion dollars of global investment. In 2020 this number fell to 121.5 billion, probably due to the Covid pandemic. In the first half of 2021, the global investment was already 98 billion dollars (Wintermeyer 2017 and Statista).

Probably the largest success of FinTech companies is a mobile banking service called M-Pesa (Buku and Meredith 2013), run by Vodafone and Safaricom, which is the largest mobile network operator in Kenya. According to the Economic (the Economist, 2013): ‘paying for a taxi ride using your mobile phone is [now] easier in Nairobi than it is in New York’. M-Pesa facilitated with success 4.1 billion transactions in Kenya in 2015 (Ondieki, 2016), and the numbers are still rising as it expanded to other countries: Tanzania, Afghanistan, South Africa, India, Romania, Albania, Mozambique, Lesotho, and Egypt. M-Pesa allows one to deposit, withdraw, transfer money, make payments, take a loan (with Kenya Commercial Bank), make savings only with a mobile phone. M-Pesa accepts approximately 80% of loan applications (Aglinby, 2016). In Kenya,

M-Pesa filled the market gap of a cash transfer service, and until 2014 it penetrated 90% of the Kenyan market. It used the existing mobile phone infrastructure (Mas 2011).

Another big success of FinTech services was observed in India. FinTech companies targeted under-served communities and offered them easy and affordable financial services. The most popular service is called Paytm, which reached 200 million users in 2017 (Variyar 2017).

The list of successful FinTech financial services would not be complete without Alibaba, an online lending platform in China. There are a lot of excluded individuals in China, and this platform, and generally, FinTech lending platforms, became extremely popular in China. It is nowadays the largest FinTech lending market in the world (Huang, Li, and Shan (2019)). According to Wang (2004), historically, small and medium companies in China struggled with obtaining loans from large banks as they were controlled or owned by the state. According to Lin (2017), peer-to-peer lending platforms are so popular in China due to very low-interest rates on savings accounts in banks. According to Weinland (2017), the peer-to-peer market in China surpassed 100 billion dollars in value.

Description of the research method

The aim of the research described in the article was to analyze the demographic characteristics of people using and not using financial services on the FinTech market in Poland, especially payments and transfers. In order to investigate these features, we used the research questionnaire, the purpose of which was to collect relevant information, i.e., primary demographic data such as gender, age, education, place of residence, and the range of FinTech services that the respondents (232 people) knew or used. Table 1 shows an outline of the questions asked in the survey (Table 1 presents all the problems that were examined with the use of the survey to show its scope, but the research part only used demographic data and answers indicating the level of knowledge of FinTech technology and market).

Table 1: The thematic structure of the survey

Itemized	Description
1	Gender
2	Age group
3	Highest education
4	Employment status
5	Size of the place of residence
6	How well is the term "FinTech" known to you?
7	Recognition of most popular FinTech online payment firms in Poland
8	Recognition of most popular FinTech online financial advisory firms in Poland
9	Recognition of most popular FinTech online investing services in Poland
10	Recognition of most popular FinTech online crowdfunding companies in Poland
11	Recognition of most popular FinTech online insurance companies in Poland
12	Recognition of most popular FinTech online exchange offices in Poland
13	Using most popular FinTech online payment firms in Poland
14	Using most popular FinTech online financial advisory firms in Poland
15	Using most popular FinTech online investing services in Poland
16	Using most popular FinTech online crowdfunding companies in Poland
17	Using most popular FinTech online insurance companies in Poland
18	Using most popular FinTech online exchange offices in Poland
19	Recognition of disadvantages of FinTech firms
20	Recognition of advantages of FinTech firms
21	Recognition of disadvantages of traditional financial institutions
22	Recognition of advantages of traditional financial institutions
23	Which institutions You trust more: FinTech firms or traditional financial institutions
24	What impact are going to have FinTech firms on traditional firms
25	Threats resulting from the use of FinTechs

Itemized	Description
26	Protection against threats from the use of FinTechs
27	Do FinTechs make life easier?
28	Impact of COVID pandemic of the development of FinTech companies

Then, a decision tree was used for the research, the branches of which lead to specific classes representing the level of knowledge of the FinTech technology and market.

The easiest way to define a decision tree is that it is a tree of decisions and their possible consequences. When one uses decision trees to analyze an existing data set, the building of the tree begins with finding the feature that best differentiates the data in terms of some final result that is interesting to us. After creating the first node, the next feature is searched for that best differentiates the split data for the same final result. The splits continue until either the tree has reached the appropriate depth or the subsequent splits do not improve the tree's effectiveness in predicting which resulting class the given observation will go to.

In the case of our research, the end result was the level of knowledge of FinTech financial services. Based on the answers provided, the survey participants were classified into five groups of the level of knowledge of FinTech financial services. The first group are people who do not know and do not use these types of services, the second group are people who know these services but do not use them, the third group are people who know and use these types of services, but only in the field of payments and transfers, the fourth group are people who know other financial services from the FinTech market, but only use payments and transfers, the last, fifth group are people who also use other services besides payments and transfers. The division into classes resulted from the development of the FinTech market in the world and in Poland - with a huge dominance of payment services and transfers.

The task of the decision tree was to find among all demographic characteristics of the respondents those characteristics that determine the level of knowledge of financial services from the FinTech market, which we treated as determinants of inclusion in the financial system. We were most interested in the elderly and people from small cities and villages, whether they include people unfamiliar with or not using FinTech financial services. If the decision tree created a branch leading to people from the first or second class, it would be proof that some people do not use the basic FinTech service such as transfers and payments. For us, this would prove that the FinTech market still has the potential to develop and, consequently, to increase the inclusiveness of such people in the financial system.

Results and Interpretation

The results of the construction of the decision tree are presented in Figure 2. It shows that people with secondary education only went to the first or second class, i.e., they were either completely unfamiliar with FinTechs or only heard about them but never used them. In the case of people with non-secondary education, it was important whether they lived in towns with a population greater than or less than 100,000. The inhabitants of small towns and villages mostly belonged to the first and second groups, which means that they again did not know or only recognized FinTech companies. Age turned out to be important in the case of larger cities. People aged 25-35 who worked were mainly in the fifth class, which means that they not only knew but also widely used FinTechs. Some of the working inhabitants of large cities also belonged to the third and fourth class. People under 35 who did not work were in the first class. People of other age, if they were working students, mainly represented the fourth class. People of a different age than 25-35 who were not working students could be classified into different categories based on the following criteria:

(a) A working person under the age of 50, a man from a large city (from 250,000 inhabitants) - class four,

(b) A working person under the age of 50, a man from a smaller town (less than 250,000 inhabitants) - class one,

(c) A working person under the age of 50, a woman from a larger city, holding an academic title – class three,

(d) A working person under the age of 50, a woman from a larger city, without an academic title – class one,

(e) A working person under the age of 50, a woman from a smaller town aged 36-50 years – class one,

(f) A working person under the age of 50, a woman from a smaller town with an age range other than 36-50 - class three, four, five,

(g) A working person over the age of 50, working, class one,

(h) Non-working person, male, class three,

(i) Non-working person, woman, age over 50 – class one,

(j) Non-working person, female under 50 – class five.

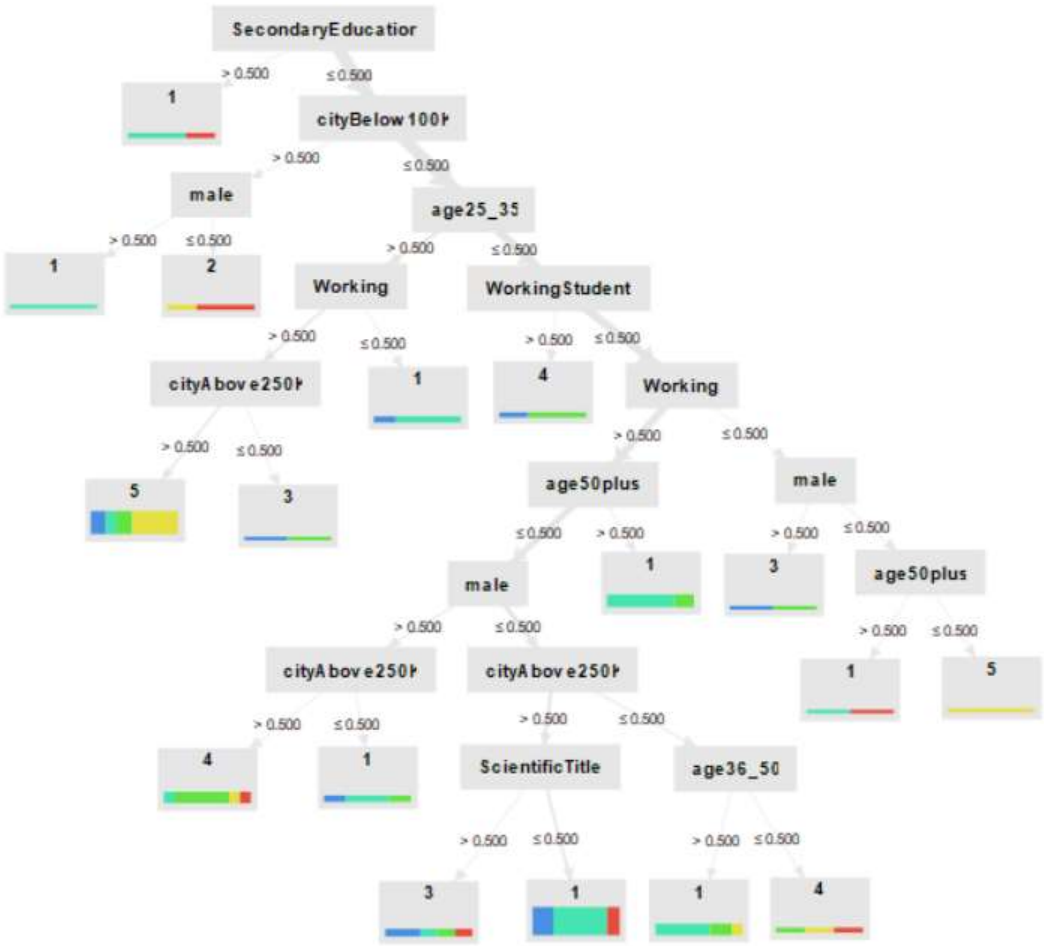

Fig 1: Decision tree predicting the level of knowledge of FinTech companies based on demographic features

Conclusions and policy recommendations

The presented results of the survey analysis show that in small towns in Poland, the knowledge of FinTechs is negligible or even non-existent, with men being worse than women, regardless of the age group. Education also had a significant impact on the knowledge of the FinTech market - if it was secondary or lower education, then again, the respondents practically did not know anything about FinTechs, nor did they use them, of course. People from larger cities with age over 50 also had virtually no knowledge of FinTechs. People from large cities, especially working women under 50, had excellent knowledge of FinTechs. The academic title also contributed to a better understanding of FinTechs, but only for women. In the case of men, the age below 50 and the size of the town they live in were important - the bigger, the better was the knowledge of FinTechs.

The decision tree used in the research shows that in the case of Poland, the FinTech sector did not reach small towns or people over 50 years of age. Thus, it does not have an inclusive function towards those potentially most excluded from the financial system. This may be due to quite a good market penetration by banks in Poland, where for people over 16 years of age, only 10% of Poles do not have a bank current account. Nevertheless, the research did not confirm inclusiveness. Also, the research hypothesis about the widespread use of online payments should be rejected. In the case of small towns and the elderly, many people do not use them.

It should be noted that our findings are preliminary, as the research sample was not representative. Therefore, the direction of future research will be to expand the research sample and to add questions about the scope of use by respondents of services offered by traditional financial institutions.

In terms of policy recommendations, Poland seems to lack internet education in small localities for older people. The Polish school system includes five hours of computer science a week in primary schools, in secondary schools from 6 hours a week, but this applies to young people. Older people do not participate in this learning process. As can be seen from the presented results, they do not make online payments. In the era of revolution 4.0, this is disturbing, although a positive signal is that people at a young age do not have such problems. So as time goes on, older and older generations will be using online financial services.

Acknowledgements

The publication was financed by the subsidy granted to the University of Economics in Krakow.

References

- Aglionby, J. (2016) 'Fintech takes off in Africa as lenders tap mobile technology', *Financial Times*, 17 May 2016, 1.
- Allen, F., Gu X. and Jagtiani J. (2020) 'A survey of FinTech research and policy discussion', *Federal Reserve Bank of Philadelphia Working Papers*, Research Department, WP 20-21, June.
- Allen, F., Demirguc-Kunt, A., Klapper, L., Soledad, M. and Peria, M. (2016) 'The Foundations of Financial Inclusion: Understanding Ownership and Use of Formal Accounts', *Journal of Financial Intermediation* 27: 1–30.
- Asongu, S.A. and Nwachukwu, J.C. (2017) Recent Finance Advances in Information Technology for Inclusive Development: A Survey, African Governance and Development Institute.
- Badruddin, A. (2017) 'Conceptualization of the Effectiveness of Fintech in Financial Inclusion', *International Journal of Engineering Technology Science and Research IJETSR*, 4(7), 959-965.
- Beck, T., Demirguc-Kunt, A., Levine R. (2007) 'Finance, Inequality and the Poor', *Journal of Economic Growth* 12: 27–49.
- Berg, T., Burg, V., Gombovic, A. and Puri, M. (2018) On the Rise of Fintech — Credit Scoring Using Digital Footprints, Working Paper.
- Berkmen, P., Beaton, T., Gershenson, D., Arze del Granado, J., Ishi, K., Kim, M., Kopp, E. and Rousset, M. (2019) Fintech in Latin America and the Caribbean: Stocktaking, IMF Working Paper 19/71, International Monetary Fund, Washington, DC.
- Blancher, N., Appendino, M., Bibolov, A., Fouejieu, A., Li, Jiawei, Ndoye, A., Panagiotakopoulou, A., Shi, Wei and Sydorenko, T. (2019) Financial Inclusion of Small and Medium-Sized Enterprises in the Middle East and Central Asia, IMF Departmental Paper No. 19/02, International Monetary Fund, Washington, DC.
- Buckley, R., Webster, S. (2016) FinTech in developing countries: charting new customer journeys, University of New South Wales Law Research Studies, Sydney.
- Buku, M. W. and Meredith, M.W. (2013) 'Safaricom and M-PESA in Kenya: Financial Inclusion and Financial Integrity', *Washington Journal of Law*, Technology and Arts 8.
- Butler, A., Cornaggia, J., Gurun, U. (2017) 'Do Local Capital Market Conditions Affect Consumers' Borrowing Decisions?', *Management Science,* 63(12): 4175–4187.
- Ceglarz, J. (2021) 'Co dziesiąty Polak nie ma konta w banku. NBP zapowiada wsparcie', 19.04.2021, *Money.pl* [@] https://www.money.pl/gospodarka/co-dziesiaty-polak-nie-ma-konta-w-banku-nbp-zapowiada-wsparcie-6630775532010144a.html.
- Crowe, C., and Ramcharan, R. (2012) The Impact of House Prices on Consumer Credit: Evidence from an Internet Bank, Federal Reserve Board, FEDS Working Paper.
- Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S. and Hess, J. (2018) The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution. World Bank. https://doi.org/10.1596/978-1-4648-1259-0.
- Dev, S.M. (2006) 'Financial inclusion: issues and challenges', *Econ. Polit. Wkly*, 41, 4310–4313.
- Donovan, K. (2012) Mobile money for financial inclusion. In: Information and Communications for Development, pp. 61–73. https://doi.org/10.1596/978-0-8213-8991-1.
- Economist (2013) 'Why does Kenya lead the world in mobile money?', *The Economist* (online), 27 May 2013 <http://www.economist.com/blogs/economist-explains/2013/05/economist-explains-18>.
- Ondieki, E. (2016) M-Pesa Transactions Rise to Sh15bn Daily After Systems Upgrade (8 May 2016) <http://www.nation.co.ke/news/MPesa-transactions-rise-to-Sh15bn-after-systems-upgrade/1056-3194774-llu8yjz/index.html>
- Frost, J., Gambacorta, L., Huang, Y., Shin, H. and Zbinden, P. (2019) BigTech and the Changing Structure of Financial Intermediation, BIS Working Paper 779.
- Grohmann, A., Klühs, T., Menkhoff, L. (2018) 'Does financial literacy improve financial inclusion?', *World Dev.* 111, 84–96. https://doi.org/10.1016/j.worlddev.2018.06.020.
- GSMA (2017) Country Overview : Ghana Driving Mobile-Enabled Digital Transformation.

- Guild J. (2017) 'FinTech and the future of finance', *Asian Journal of Public Affairs,* 10(1): e4.
- Hau, H., Huang, Y., Shan, H. and Shen, Z. (2018) FinTech Credit, Financial Inclusion and Entrepreneurial Growth, University of Geneva Working Paper.
- Hodula, M. (2021) 'Does Fintech credit substitute for traditional credit? Evidence from 78 countries', *Finance Research Letters*, 102469, ISSN 1544-6123, [@:] https://doi.org/10.1016/j.frl.2021.102469.
- Howard, T., and Hedrick-Wong, Y. (2019) How Digital Finance and Fintech Can Improve Financial Inclusion In Inclusive Growth. Published online: 01 Apr 2019; 27-41.
- Huang, Y., Li Y. and Shan H. (2019) The Distributional Effect of Fintech Credit: Evidence from E-commerce Platform Lending, University of Geneva Working Paper.
- Jack, W., Sur,i T. (2016) 'The Long-Run Poverty and Gender Impacts of Mobile Money', *Science* 354 (6317): 1288–92.
- Jagtiani, J., and Lemieux, C. (2017) Fintech Lending: Financial Inclusion, Risk Pricing, and Alternative Information, Federal Reserve Bank of Philadelphia Working Paper No. 17–17, Philadelphia.
- Jagtiani, J., Lambie-Hanson, L. and Lambie-Hanson, T. (2019) Fintech Lending and Mortgage Credit Access, Federal Reserve Bank of Philadelphia Working Paper 19-47, November.
- Jagtiani, J. and Lemieux, C. (2019) 'The Roles of Alternative Data and Machine Learning in Fintech Lending: Evidence from LendingClub Consumer Platform', *Financial Management Winter,* 48(4), 1009–1029.
- Kabza, M. (2018) 'FinTech wspiera inkluzję finansową', *ObserwatorFinansowy.pl*, 10.08.2018, [@:] https://www.obserwatorfinansowy.pl/bez-kategorii/rotator/fintech-wspiera-inkluzje-finansowa/
- Kefela, G. (2010) 'Promoting access to finance by empowering consumers – Financial literacy in developing countries', 5(5) *Educational Research and Reviews* 205.
- Klapper, L., Lusardi, A., and van Oudheusden, P. (2015) Financial Literacy Around the World: Insights from the Standard & Poor's Ratings Services Global Financial Literacy Survey, 1(7) <https://media.mhfi.com/documents/2015-Finlit_paper_17_F3_SINGLES.pdf>.
- Kodan, S. A., and Chhikara, K.S. (2013) 'A Theoretical and Quantitative Analysis of Financial Inclusion and Economic Growth', *Management and Labour Studies* 38(12), 103-133.
- Lin, X., Li, X. and Zheng, Z. (2017) 'Evaluating Borrower's Default Risk in Peer-to-Peer Lending: Evidence From a Lending Platform in China', *Applied Economics,* 49 (2017) 35, 3538-3545.
- Lubis, A., Dalimunthe, R. and Situmeang, C. (2019) Antecedents Effect of Financial Inclusion for the People of North Sumatera. Budapest International Research and Critics Institute (BIRCI-Journal) : Humanities and Social Sciences. 2. 401-408. 10.33258/birci.v2i4.602.
- Mas, I. and Radcliffe, D. (2011) 'Mobile Payments Go Viral: M-Pesa in Kenya', *Journal of Financial Transformation* 32, 169-182.
- Maurer, B. (2012) Mobile money: communication, consumption and change in the payments space. J. Dev. Stud. 48, 589–604. https://doi.org/10.1080/00220388.2011.621944.
- Mugambi, A., Njunge, C. and Yang, S.C. (2014) Mobile-money benefits and usage: The case of M-PESA. IT Prof 16, 16–21. https://doi.org/10.1109/MITP.2014.38.
- Nabi, M. S. (2017) Role of Islamic Finance in Promoting Inclusive Economic Development, Global Sustainable Finance Conference 2013, Germany (4th to 5th July 2013), http://www.wfdfi.net/wp-content/uploads/2013/09/6-Mahmud_Nabi.pdf.
- Osei-Assibey, E. (2015) 'What drives behavioral intention of mobile money adoption? The case of ancient susu saving operations in Ghana', *Int. J. Soc. Econ*. 42, 962–979. https://doi.org/10.1108/IJSE-09-2013-0198.
- Peruta, M. D. (2017) 'Adoption of mobile money and financial inclusion: a macroeconomic approach through cluster analysis', *Econ. Innovat. N. Technol*. 27, 1–20. https://doi.org/10.1080/10438599.2017.1322234.
- Rai, S. (2017) Paytm Raises $1.4 billion from SoftBank to Expand User Base, Bloomberg, May 18, 2017.
- Reuters (2016) Here are Some of China's New Rules on P2P Lending, August 24.
- Sahay, T., Eriksson von Allmen, U., Lahreche, A., Khera, P., Ogawa, S., Bazarbash, M. and Beaton K. (2020) The Promise of Fintech Financial Inclusion in the Post COVID-19 Era, 20(9), International Monetary Fund, Washington.
- Schweitzer, M., Barkley, B. (2017) Is Fintech Good For Small Business Borrowers? Impacts on Firm Growth and Customer Satisfaction, Federal Reserve Bank of Cleveland Working Paper.
- Senyo, P.K., Liu, K. and Effah, J. (2019) 'Digital business ecosystem: literature review and a framework for future research', *Int. J. Inf. Manag*. 47, 52–64. https://doi.org/10.1016/j.ijinfomgt.2019.01.002.
- Shankar, S. (2016) Bridging the "Missing Middle" between Microfinance and Small and Medium-Sized Enterprise Finance in South Asia (Working Paper No. 587, Asian Development Bank Institute, July) .
- Sioson, E.P. and Kim, C.J. (2019) 'Closing the Gender Gap in Financial Inclusion through Fintech', *Policy Brief*, 3(April); 1-8.
- Sy, A. N. R., Maino, R., Massara, A., Perez-Saiz, H. and Sharma, P. (2019) Fintech in Sub-Saharan African Countries: A Game Changer?, African Departmental Paper No. 19/04, International Monetary Fund, Washington, DC.

- Tam, L.T. and Hanh, L.N. (2018) 'Fintech for Promoting Financial Inclusion in Vietnam: Fact Findings and Policy Implications', *Business and Social Sciences Journal (BSSJ)*, 3(1), pp. 12 – 20.
- Tarazi, M., Breloff, P. (2010) Nonbank E-Money Issuers: Regulatory Approaches to Protecting Customer Funds, CGAP Focus Note No. 56629, Consultative Group to Assist the Poor, Washington, DC.
- The World Bank (2015) The Case for Financial Literacy in Developing Countries: Prompting Access to Finance by Empowering Consumers (Joint Note, 2009) 4 <https://www.globalbrigades.org/media/Financial_Literacy.pdf>;
- The World Bank Group (2016) Overview http://www.worldbank.org/en/ programs/ globalfindex/ overview>.
- Variyar, M. (2017) 'Paytm Wallet Reaches 200 Million Users', *The Economic Times*, February 28, 7.
- Wang, Y. (2004) 'Financing Difficulties and Structural Characteristics of SMEs in China', *China and World Economy* 12, 123-131.
- Weinland, D. (2017) 'China P2P Lenders Braced for Regulatory crackdown', *Financial Times*, January 9, 5.
- Wintermeyer, L. (2017) 'Global FinTech VC Investment Soars in 2016,' *Forbes*, February 17: 2.
- World Bank (2018) Financial inclusion on the rise, but gaps remain [WWW Document]. Press Release. https://www.worldbank.org/en/news/press-release/2018/04/19/financial-inclusion-on-the-rise-but-gaps-remain-global-findex-database-shows.