

Consumer awareness and acceptance of digital-only banks

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Abstract

The study verifies customers' acceptance as well as knowledge and awareness of the new business model of a bank – a digital-only bank. Using Computer Assisted Web Interviews, data were collected through a questionnaire from 515 adults in Poland. The Mann-Whitney U test and the Spearman rank correlation coefficient significance test were used to verify the hypotheses. Our analysis shows that there is a relationship between knowledge and awareness, as well as innovativeness, and the use of the services of a digital-only bank. The higher the knowledge and awareness as well as the innovativeness, the greater the intention to use the services of a digital-only bank. The findings of this study provide important guidelines regarding the strategy of development for banks operating under an innovative business model.

Keywords: digital-only bank, virtual banking, FinTech, consumer behaviour, innovation acceptance

JEL: O33, G21, D19

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1. Introduction

Digital-only banks, also known as FinTech banks, are institutions that began to develop rapidly after the global financial crisis of 2007–2009 as a response to the progressing changes and problems facing the traditional banking sector. Digital-only banks are financial institutions that operate under a banking licence and offer online services to their customers through a website or a mobile application. These institutions were established from scratch or have evolved from FinTechs and do not have brick-and-mortar branches, subsidiaries, or offices (Yu-chen 2022). This new model of banking has begun to develop rapidly around the world, especially in economies characterised by highly developed financial systems. A significant number of digital-only banks have been established in the UK, the most popular of which are Monzo Bank and Starling Bank. In Europe, the German N26 and Revolut lead the way, and in the United States we can find Varo Bank as an example of a digital-only institution. Asian markets have also adopted this trend through WeBank, Kakao Bank, or KBank.

Innovation, although desirable and necessary, does not always have immediate social acceptance. Understanding the level of public acceptance of innovation and the awareness and knowledge of a particular innovation is extremely important for the success of a business enterprise or project (Laukkanen 2016). As stressed by Meuter et al. (2005, p. 78) “for many firms, often the challenge is not managing the technology but rather getting consumers to try the technology”. Thus, there have been numerous studies concerning the acceptance and adoption of new technological solutions within the banking sector, especially concerning mobile and online banking (Albort-Morant, Sanchís-Pedregosa, Paredes 2022; Khan et al. 2022; Majumdar, Pujari 2022; Baptista, Oliveira 2015; Lin 2011; Luo, Zhang, Shim 2010). There is also a great number of works that focuses on the FinTech and BigTech disruption (Jünger, Mietzner 2020; Tanda, Schena 2019; Vives 2019; Wewege, Thomsett 2022) presenting general overview on the digital revolution in banking. However, digital-only banks are different financial institutions that go beyond mobile and online banking by offering their customers a completely new experience and a new business model.

The studies mentioned above are therefore not directly applicable in this case. The fact that a customer accepts modern technological solutions within a traditional bank does not mean they will accept and use the services of a digital-only bank. The same with BigTech companies and FinTechs. If the customer uses Google Pay, does it mean she/he will like to use a digital-only bank? To address this gap in the existing literature, this study will verify the level of acceptance of digital-only banks by identifying potential opportunities and barriers to the development of this type of institution as well as the state of knowledge and awareness regarding digital-only banks.

Following on from the above, the following research questions are stated:

- 1) Is there any relation between knowledge and awareness, innovativeness, perceived risk, and intention to use the services of a digital-only bank?
- 2) Is there any relation between personal characteristics (place of residence, net income, education, and age) and intention to use the services of a digital-only bank?
- 3) What, from the perspective of the consumer, are the main advantages and concerns regarding digital-only banks that may create opportunities and barriers to the development of these institutions?

This study offers several novel contributions. In many countries, especially those without a highly-developed financial market, digital-only banks are still a relatively new concept, which makes it essential to understand consumers’ level of knowledge and awareness regarding this new model of

banking. Moreover, there is much confusion in the relevant literature and among users of online and mobile financial services concerning the ring-fencing of digital-only banks (Büchi et al. 2019). There is much research that combines the different types of innovative institutions offering financial services (i.e. FinTechs, challenger banks, neo-banks, beta banks) – however, not all possess a banking license. Thus, testing the sets of hypotheses within this study adds to the existing theory about financial innovations and enables the formulation of meaningful and direct recommendations for traditional banks as well as digital-only banks considering opportunities for further development, especially within the developing markets.

This paper is organized as follows. Section two contains a literature review concerning the problem of innovation acceptance as well as consumer attitudes towards digital-only banks. Section three contains the hypotheses development. Section four presents data and methodology. Section five is dedicated to the presentation of the results. Section six contains a discussion, and in the last section, there are conclusions, theoretical and practical implications as well as identification of the study's limitations and areas for future research.

2. Literature review

According to Venkatesh et al. (2003), unified theory of acceptance and use of technology theory's (UTAUT) four constructs play a significant role as direct determinants of user acceptance and usage behaviour. These four constructs are performance expectancy, effort expectancy, social influence, and facilitating conditions. Performance expectancy states that a user's intention to adopt new technology is determined by its perceived usefulness and ease of use. Effort expectancy is connected to the degree of ease associated with using the system. Social influence is defined as the degree to which a person perceives that other people believe they should use the new system, and facilitating conditions measures the degree to which a person believes that organizational and technical infrastructure exists to support the use of the system (Venkatesh et al. 2003). Furthermore, those four constructs are moderated by gender, age, experience, and voluntariness of use. The UTAUT theory is currently perceived as the most complex and was based upon conceptual and empirical similarities across eight models and theories of individual acceptance. Recent research uses UTAUT to predict FinTech adoption (Singh, Sahni, Kovid 2020), mobile payments adoption (Slade et al. 2015), and e-banking, m-banking adoption (Alalwan et al. 2018; Baptista, Oliveira 2015; Martins, Oliveira, Popovič 2014; Kamdjoug et al. 2021).

However, several studies argue that there are also other factors affecting individual banking decisions. Jebarajakirthy and Shankar (2021) examined how online convenience affects m-banking adoption behaviour, proving that customers tend to adopt m-banking services as they believe they can avail banking services 24 × 7 from anywhere and that they can complete the transaction just in a few clicks. Maier (2016) and Manrai and Manrai (2007) outlined that lack of trust and dissatisfaction are very often important reasons private customers decide to switch financial institutions. Perceived risk (Mbama, Ezepue 2018; Thakur, Srivastava 2014) as well as the level of knowledge (Slade et al. 2015) or innovativeness – understood as a person's desire to seek out the new and different – can also strongly influence the outcome (Thakur, Srivastava 2014).

Several studies concerning digital-only banks (Nel, Boshoff 2021a, 2021b) indicate a certain resistance to such institutions, which is due, among other things, to satisfaction with the status quo

and inertia. As Nel and Boshoff (2021b, p. 430) state, “Overcoming inertia is critical for the successful introduction of innovations.” In addition, when implementing a new banking model, the attitude of traditional banking customers is important, which determines the level of opposition from the very beginning. Digital-only banks were also studied by Windasari et al. (2022), who analysed the experiential factors affecting digital-only banking services among generation Y and Z. Windasari et al. (2022) proved that economic value, ease of use, social influence, firm reputation, features and reward are significant variables in modelling customer intention to use digital-only banks. Suhaimi and Hassan (2018) studied the acceptance of branchless banking in Malaysia and demonstrated that two factors are particularly important for the acceptance of digital branchless banking – the customers’ perceived ease of use and the amount of information available about the innovation.

3. Hypotheses development

The set of hypotheses presented is divided into three areas. The first area is knowledge and awareness, innovativeness and perceived risk, the second area is personal characteristics, and the third area refers to opportunities and barriers for development of digital-only banks. In this paper, the authors test chosen factors indicated in the literature that were proved to significantly influence individuals’ acceptance of innovation. Therefore, for the first category of hypotheses – knowledge and awareness, innovativeness, and perceived risk were tested. In the second category, age, education, place of residence, and net income were taken into consideration. The final category aims to identify the advantages of digital-only banks and the main obstacles to the development of digital-only banks.

3.1. Knowledge and awareness, innovativeness and perceived risk

Knowledge and awareness

A lack of knowledge has long been considered a barrier to the adoption of new technology and innovation. According to Jiang (2009, p. 429), “knowledge of mobile Internet may help reduce the uncertainty and perceived risk associated with the online channel and ultimately increase the likelihood of use.” Shim, Serido and Tang (2013) proved that there is a significant interaction between the young adults’ level of trust and their objective financial knowledge whereas Pal, Herath and Rao (2021) showed that individual knowledge on mobile payment drives its usage and diffusion. The effect of knowledge of innovation on behavioural intention was also examined by Singh, Sahin and Kovid (2020), Slade et al. (2015) and others. In addition to knowledge, the state of awareness is very important. As Wewege and Thomsett (2020) wrote, very often the primary barrier to the uptake of services of FinTech companies is simply due to a lack of awareness of those types of companies and the services they provide. It was also stated by Al-Somali, Gholami and Clegg (2009), who pointed that the low awareness of online banking may be a critical factor in causing customers not to adopt online banking. Based on these notions, two hypotheses were developed:

Hypothesis 1: More than half of consumers are not aware of any brand of digital-only banks.

Hypothesis 2: There is a positive relationship between the knowledge of the term FinTech and the intention to use the services of a digital-only bank.

Innovativeness

Innovativeness – or what Thakur and Srivastava (2014) refer to as personal innovativeness – has been shown to have a significant and direct effect on behavioural intention as well as perceived usefulness and perceived ease of use. Innovativeness can be understood as the extent to which someone is open to experiencing and experimenting with a new technology (Slade et al. 2015). Some of the research indicates that the concept of consumer innovativeness is an important extension to UTAUT – the original model fails to recognize the importance of individual differences during the adoption process of innovation (Slade et al. 2015). The significance of innovativeness was also tested by Lee (2014) and Windasari et al. (2022), although the latter used the term curiosity defining it as the desire to learn and learn something to gain new knowledge. Therefore, considering innovativeness as an important construct of an individual's innovation acceptance, the third and fourth hypotheses are proposed as follows:

Hypothesis 3: There is a positive relationship between the use of online and mobile banking services and the intention to use the services of a digital-only bank.

Hypothesis 4: There is a positive relationship between the use of modern technological solutions and the intention to use the services of a digital-only bank.

Perceived risk

There is always a certain risk when dealing with something new or unknown. According to Featherman and Pavlou (2003), perceived risk can have several dimensions, including performance risk, financial risk, time risk, psychological risk, social risk, privacy risk, and overall risk. All of these risks influence the perceived usefulness and perceived ease of use which impact adoption intention. Such risk/concern has been identified as a negative valence in multiple studies, for example Jun and Palacios (2016) found security to affect service quality of mobile banking. Mbama and Ezepue (2018) proved that perceived risk has a negative impact on digital banking experience and Pal, Herath and Rao (2021) showed that perceived risk negatively influences actual usage of mobile payment technologies and future intention.

Digital-only banks are often confused with FinTechs that offer financial services but do not guarantee deposits. There are also many mobile applications that serve as a tool for financial management or as a payment platform. The respondents were asked whether they verify those applications for security. It was assumed that if respondents verify companies offering financial services, they perceive certain risks and will be more eager to use the services of institutions that are supervised and guarantee deposits. Therefore, the fifth hypothesis is proposed as follows:

Hypothesis 5: There is a positive relationship between the awareness of the security of financial applications and the intention to use the services of a digital-only bank.

3.2. Personal characteristics

The second set of hypotheses refers to individual characteristics, which in many studies were proved to be significant moderators (Akhter 2012; Untaru, Han 2021; Zhang, Chen, Lee 2013). According to Polasik and Wisniewski (2009, p. 39), “attitudes towards new technologies may be linked to a set of

personal characteristics. For instance, people with high educational attainment may have an aptitude for computers and possess good information processing skills.” Demographic factors were also considered in works related to the banking sector. Shankar and Jebarajakirthy (2019) wrote that age, income, and education can drive customer loyalty to e-banking, whereas Gan et al. (2006) included age, gender, marital status, ethnic background, educational qualification, employment, income and area of residence when analysing consumers’ choices between electronic banking and non-electronic banking. In this study, we decided to analyse the direct influence of personal characteristics such as place of residence, net income, education, and age on the intention to use the services of a digital-only bank.

Place of residence

The place of residence can determine one’s use of online and mobile banking services. On the one hand, it may be difficult for people from rural areas and smaller towns to use Internet banking because access to broadband Internet is more limited than in larger metropolitan areas (Polasik, Wisiniewski 2009). On the other hand, bank offices and branches are very often located in larger towns, forcing inhabitants of rural areas to travel some distance to visit a bank personally (creating a travelling cost). There are countries where access to banks is generally limited – in such cases, digital-only banks are perceived as institutions that can deepen financial inclusion (Jeník, Zetterli 2020). Laforet and Li (2005) as well as Lichtenstein and Williamson (2006) proved that the place of residence affects Internet banking adoption. The place of residence as one of the factors influencing online banking adoption was also analysed by Albort-Morant, Sanchís-Pedregosa and Paredes (2022), however in this study it was not proved to be significant. Based on this notion, the following hypothesis is proposed:

Hypothesis 6: There is a negative relationship between the place of residence and the intention to use the services of a digital-only bank. The smaller the place of living, the less the willingness to use the services of a digital-only bank.

Net income

The respondents’ wealth is proved to affect their decisions. Stavins (2001) argued that there is a much stronger possibility that people with a higher income will use credit cards, ATMs, or Internet banking. Lassar, Manolis and Lassar (2005) and Jiménez and Díaz (2019) also confirmed that level of income is positively and significantly related to online banking use or adoption. On the other hand, Shankar and Jebarajakirthy (2019) assumed that those who receive a very high income may prefer offline banking to online banking because they receive special services. However, in our perception it would refer more to private banking than retail banking. Based on this notion, the following hypothesis is proposed:

Hypothesis 7: There is a positive relationship between the average net income per person in the household and the intention to use the services of a digital-only bank. The higher the average net income per person in the household the greater the intention to use the services of a digital-only bank.

Education

Education level is considered an important personal characteristic that determines use behaviour. The basic relationship proved in the literature is that as the level of education increases, so does the use

of online banking services (Al-Somali, Gholami, Clegg 2009). The positive relationship was also proved by Szopiński (2016) and Jiménez and Díaz (2019), who argued that as the level of education increased, so did the probability of using online banking. Therefore, considering education as an important factor influencing intention to use the services of digital-only banks, the eighth hypothesis is proposed as follows:

Hypothesis 8: There is a positive relationship between the level of education and the intention to use the services of a digital-only bank. The higher the level of education, the greater the intention to use the services of a digital-only bank.

Age

Modern technological solutions are most often associated with young people. The older the individual, the less likely it is they will use online banking (Jiménez, Díaz 2019; Szopiński 2016). As noted by Cham et al. (2022, p. 1038), “adaptive intention among elderlies is restricted by the lack of confidence towards their ability to thoroughly master the technology, motivation for proactive alterations in their current lifestyle as well as the misconception on risks of mobile transactions.” Gan et al. (2006) showed that senior consumers were less likely to use electronic banking because they are more risk-averse and prefer a personal banking relationship. A personal relationship is a feature that will not be found when banking at digital-only banks. Therefore, although digital-only banks can serve all groups of customers, they are more often chosen by younger generations, who are more tech-savvy and keen on the gig economy. Based on this notion, the following hypothesis is proposed:

Hypothesis 9: There is a negative relationship between age and the intention to use the services of a digital-only bank. The older the person the less the intention to use the services of a digital-only bank.

3.3. Opportunities and barriers for development of digital-only banks

All over the world there are still relatively few digital-only banks that customers can use in comparison to the number of traditional banks. The greater number of banks operating under the new innovative model can be found in well-developed financial markets like Great Britain or the US rather than in developing or emerging markets. However, taking into consideration the features and possibilities of digital-only banks, it seems that they also have opportunities to become important players on the less financially advanced markets. Therefore, to check what can be an advantage and what can pose obstacles in the development of digital-only banks we asked respondents about the perceived advantages and their concerns connected with these institutions.

Windasari et al. (2022) wrote that digital-only banks have advantages for traditional banks and customers, as they provide more convenient and faster banking services. Additionally, they fulfil some tasks of physical wallets, such as facilitating cash and credit payments. Schmidt-Jessa (2022) also mentioned that digital-only banks provide easy access to financial services, which are very often offered at a lower price as being a virtual institution allows for saving lots of costs. On the other hand, Schmidt-Jessa (2022) noticed that not all people may be interested in the use of digital-only banks, especially for safety reasons. This was emphasized by Nel and Boshoff (2021b), who pointed out that traditional banks have well-established digital banking channels and essentially over the years they have earned customers' trust. Based on the above consideration, two hypotheses are proposed:

Hypothesis 10: The main concerns regarding digital-only banks are the exclusion of older people and those without access to modern technology as well as concerns about data security.

Hypothesis 11: The main advantages of digital-only banks are time saving and convenience of use.

4. Data and methodology

To achieve the main objective, a survey was conducted among adult residents of Poland. Poland is a country that might be classified as a country with a developing financial market, where the biggest part of the financial system constitutes the banking sector. However, according to the data for 2021, Polish banking sector assets to GDP constitute only 93%, which in comparison to other European countries is one of the smallest numbers; for instance in Great Britain banking sector assets to GDP amount to 485%, and in Germany 226% (ZBP 2021). Although not very big, the Polish banking sector is perceived as very innovative, offering its customers advanced tools for online and mobile banking.

The empirical material was collected online (CAWI) in March 2022 by a professional quantitative and qualitative research consulting firm. To generate reliable responses, a purposive sampling technique was undertaken in the data collection process. The criteria used are: (1) the respondents must be eighteen years old or above; (2) the respondents must have a bank account at a traditional bank; (3) the respondents must be diversified in terms of gender, age, education, work situation, place of residence, and net income. The final population consists of 515 correctly completed questionnaires.

The prepared questionnaire consisted of twenty-five questions, of which twenty-one questions were closed questions and four questions were open questions. The questionnaire was divided into two parts, with the first part (nineteen questions) being substantive questions and the second part being metrics (six questions). To ensure the questionnaire possessed an appropriate sequential arrangement and clarity of the questions and the words used, a pre-test was performed¹ (Kumar, Talib, Ramayah 2013). In Table 9, we present the questions that allowed us to define the chosen variables.

In the study sample of 515 people, 58.10% were female and 41.9% were male. The age range for the study population was eighteen to eighty years, with a median of forty-two years. Most respondents had higher (46.80%) or secondary education (43.69%). A small percentage were people with vocational education (7.57%) or primary education (1.94%). Most respondents were employed (70.68%). Analysing the place of residence of respondents, we noted that specific categories had similar response rates, with the highest number of people living in a town up to 50 thousand inhabitants (22.72%), and the lowest in a village (17.48%). The average net income per person in the household of most respondents (55.73%) was between 436 EUR and 870 EUR. Detailed characteristics of the studied population are presented in Table 1.

The survey questionnaire was constructed in such a way as to enable the verification of the eleven research hypotheses, which were constructed within the three areas explained in section three. The verification was conducted using statistical tests, including the Mann-Whitney U test, the Spearman rank correlation coefficient significance test, and 95% confidence interval of the difference.² A similar approach was used by Hway-Boon and Yu (2003), Inegbedion (2018), and Waliszewski and Warchlewska (2020). When verifying the hypotheses, the following rules were applied:

¹ The questionnaire was pre-tested with five experts – three from economics and finance, one from qualitative and quantitative research, and one from data science.

² You can find more about the tests in Corder and Foreman (2009).

1) if one of the analysed variables was measured on the nominal scale and the other on the ordinal, the Mann-Whitney U test was used to test the hypotheses,

2) if both analysed variables were characterised by measurement on an ordinal scale, the Spearman rank correlation coefficient significance test was used,

3) if we did not search for any relationship between variables, the basic 95% confidence interval of the difference was estimated to verify the hypothesis.

In the field of behavioural sciences, the Mann-Whitney U test is one of the most commonly used non-parametric statistical tests. The Mann-Whitney U test null hypothesis (H₀) stipulates that the two groups come from the same population. In other terms, it stipulates that the two independent groups are homogeneous and have the same distribution (Nachar 2008).

The Spearman rank correlation coefficient is the nonparametric version of the Pearson correlation coefficient. Spearman's correlation provides a measure of the strength and direction of a monotonic association between ranks of the two features (Conover 1999). The value of the coefficient ranges from -1 to 1, with 1 and -1 being the strongest positive and negative correlation, respectively.

5. Empirical results³

Empirical findings are presented in this section. The description was divided into three parts corresponding to the three groups of hypotheses. First, the hypotheses formulated within the area of knowledge and awareness, innovativeness and perceived risk were verified, then the hypotheses within the area of personal characteristics, and finally the results for potential opportunities and barriers for the development of digital-only banks were presented.

5.1. Results in the area knowledge and awareness, innovativeness and perceived risk

Knowledge and awareness

To verify H₁ stating that more than half of consumers are not aware of any brand of digital-only banks, a confidence interval was estimated for the percentage of "no" indications. A percentage of 0.66 was observed in the sample, which means that the estimated interval from 0.62 to 0.70 with 95% confidence covers the true unknown percentage of people not knowing the names of digital-only banks (Table 2). The lower limit of the interval is greater than 0.50, and so it can be assumed that most people do not know any names. The indicated result allows for positive verification of H₁. At the same time, the group of people who indicated that they know digital-only banks operating in the market the most frequently cited Aion Bank (which is considered to be the first Polish digital-only bank) and Revolut Bank. It is also worth noting that within the scope of the question, respondents often pointed out PayPal (this is an online payment system) or mBank (this is a traditional bank with very innovative online solutions), which indicates differences in the understanding of a digital-only bank or perhaps even a misunderstanding of it.

³ Conclusions were made at a significance level of $\alpha = 0.05$ and a confidence level of $1 - \alpha = 0.95$.

The Mann-Whitney U test was used to verify H2. In the studied group 275 of the respondents answered that they would like to use the services of a fully digital-only bank, which is more than 53% of all respondents. At the same time, only 130 respondents indicated that they were familiar with the term FinTech. When attempting to define the term FinTech, the most frequent answer was innovative technological solutions related to the world of finance. The analyses conducted showed that the propensity to use digital-only bank services is different among those who are familiar with and those who are unfamiliar with the concept of FinTech. Analysing the mean ranks (Table 3), it is assumed that, on average, the propensity is higher among those familiar with the concept of FinTech, which means that H2 should be verified positively.

Innovativeness

In connection with the fact that a digital-only bank is an institution without branches and stationary locations, it was assumed that there is a positive relationship between the use of online and mobile banking and the intention to use the services of a digital-only bank. The Mann-Whitney U test (Table 4) showed that people who use online banking are not more inclined to use the services of a digital-only bank. However, those who use mobile banking services show such a propensity. The results of the Mann-Whitney U test (Table 4) indicate that the null hypothesis, which states that the distributions are consistent, should be rejected. Taking these results into account, H3 cannot be fully supported.

The respondents were also asked whether they were willing to use modern technological solutions offered to them by banks or other financial companies. In the study, it was assumed that there is a positive relationship between the use of modern technological solutions and the intention to use the services of a digital-only bank. Indeed, the significance test of the Spearman rank correlation coefficient (Table 5) showed that there is a correlation between the variables of moderate strength and positive direction (~ 0.41). Therefore, H4 is supported.

Perceived risk

The respondents were asked whether they have non-bank mobile applications related to financial services and financial management. It seems that having additional applications, apart from a banking application, may be an area undeveloped or inadequately explored by traditional banks. In the surveyed group, nearly 65% declared that they do not have such applications, while just over 35% indicated that they do use such applications. As the main reason for having non-bank applications for financial purposes, respondents (32.60%) indicated the time it takes for a matter to be handled by a non-bank application (i.e. it is shorter than the time required for a bank application). What is interesting and important from the point of view of the banking sector is that the second reason for using non-bank mobile applications was the unwillingness to share all data with banks. Exploring the topic of non-bank financial applications, respondents were asked whether they verify these applications for security. Within the sample, only eleven people indicated that they do not verify the applications for security. At the same time, according to the Mann-Whitney U test (Table 6), those people who verify non-bank mobile applications for security are not more inclined to use the services of a digital-only bank.

The willingness to use a digital-only bank is the same among all non-bank mobile application users.⁴ This result means that H5 should be rejected.

5.2. Results concerning personal characteristics

Due to the fact that all characteristics are measured by an ordinal scale, to test the relationship between personal characteristics and the intention to use the services of a digital-only bank, the Spearman rank correlation coefficient significance test was applied. We tested here the relationship between the intention to use the services of a digital-only bank and place of residence, net income, age, and education verifying hypotheses H6–H9. According to the results obtained, neither place of residence, net income, age, or education were found to show a significant correlation with the intention to use the services of a digital-only bank. Therefore, hypotheses H6–H9 cannot be supported. The results were presented in Table 7.

5.3. Opportunities and barriers to development of digital-only banks

In order to precisely identify potential barriers for the development of digital-only banks, a group of respondents was asked to identify the main concerns regarding digital-only banks. H10 assumed that people would identify the exclusion of older people and those without access to modern technology as well as data security as the main concerns. The question was a closed, multiple-choice question. Due to the possibility of selecting more than one answer, sample percentages for each indicator were calculated, and 95% confidence intervals for each were constructed. The hypothesis was verified by comparing the ranges of the confidence intervals. When the confidence intervals overlap to any extent, it should be concluded that their percentages do not differ significantly at the $\alpha = 0.05$ significance level. The analyses indicated that H10 is supported, with the most frequently given answers concerning data security (63.50% of respondents) and exclusion of the elderly and those without access to modern technology (58.20% of respondents). The results are presented in Figure 1.

After identifying the obstacles to the development of digital-only banks, respondents were asked about the advantages of digital-only banks. This question was also a closed, multiple-choice question. Thus, in verifying H11, the same method was used as for H10. H11 assumed that most people would indicate time saving and convenience of use as the main advantages of digital-only banks. According to the results obtained, 69.10% of respondents indicated that time saving was the main advantage and 65.00% indicated convenience of use. The analysis confirmed that the calculated sample percentages for the listed answers are not significantly different, which means that H11 can be verified positively. Interestingly, the third most frequent answer was lower costs (53.20%). Innovation and use of modern technology were indicated only in fourth place, and it was a significant advantage for 36.30% of respondents. The results are presented in Figure 2.

⁴ Taking into consideration the small number of people who said that they do not verify the security of non-bank mobile applications, it was decided to also test this hypothesis with the Monte Carlo simulation (sampling with one million repetitions) and the results were very similar.

5.4. Summary

As shown in Table 8, not all hypotheses are supported. Within the area of knowledge and awareness, innovativeness and perceived risk H1, H2, and H4 were supported. We have also found partial support for H3. There is no evidence that perceived risk influences the intention to use the services of a digital-only bank. No correlation was found in the second group of hypotheses as H7–H9 were verified negatively. The H10 and H11 referring to the opportunities and barriers for development of digital-only banks were confirmed.

6. Discussion

Digital-only banks are a relatively new business model, especially in countries with a lower level of development of financial market, like Poland. We proved that most of the respondents were unfamiliar with the concept of a digital-only bank. However, those who possess a certain level of knowledge connected with the FinTech sector tend to show the intention to use the services of a digital-only bank. The importance of knowledge was also emphasized by Slade et al. (2015) who found pioneering evidence that knowledge of mobile payments moderates the effects of antecedents of behavioural intention. Singh, Sahni and Kovid (2020) proved that Internet experience plays a significant role in affecting perceived ease of use and usefulness. Moreover, with a more experienced user, the importance of ease of use is reduced as compared to a less experienced user (Singh, Sahni, Kovid 2020). Knowledge was found to have a significant impact on actual usage and future use intention of mobile payment technologies by Pal, Herath and Rao (2021). They noted that users with greater familiarity and knowledge to use technology use it more often and for greater numbers of transactions. Majumdar and Pujari (2022) also found the importance of knowledge and awareness, proving that awareness and access to information had a significant positive impact on the adoption of mobile banking. The level of knowledge of a specific society in an area of financial innovation is important information for digital-only banks because consumer knowledge allows firms to identify the unique features of market segments and to formulate appropriate strategies for these segments. If customer knowledge is managed effectively, it can improve the innovation process and research and development activities (Taherparvar, Esmailpour, Dostar 2014).

Our study proves that individuals characterised as innovative are more willing to implement new solutions. Respondents who use mobile banking and those individuals who are willing to use modern solutions offered by their bank or other financial companies would like to use the services of a digital-only bank. Previous studies have also proved that personal innovativeness positively affects adoption readiness (Thakur, Srivastava 2013) and adoption intentions (Lu, Yao, Yu 2005). Chauhan, Yadav and Choudhary (2019), when analysing Internet banking adoption, showed that consumer innovativeness has a significant positive effect on the perceived ease of use. Taking these outcomes into consideration it can be concluded that the more innovative the society, the higher the probability of innovation acceptance. Therefore, in order to succeed, the digital-only bankers should distinguish those groups of individuals which are innovators from other potential consumers and channel all efforts to attract firstly those groups. Innovators can influence others by sharing their experience and views regarding digital-only banks (Chauhan, Yadav, Choudhary 2019).

Most of the respondents were aware of the risk associated with the use of financial services as most of them verified the security of the non-bank applications they use. Therefore, it seems that it is important for respondents to use tools offered by safe and regulated institutions. Slade et al. (2015) proved that risk negatively affects behavioural intention when using remote mobile payments. Martins, Oliveira and Popovič (2014) also found that perceived risk will negatively influence behaviour intention and performance expectancy. However, according to the results obtained in the current research, there is no inclination that people who verify the security of non-bank mobile applications will be more willing to use the services of a digital-only bank. The willingness to use digital-only banks is the same among all non-bank mobile application users. Yet, because it is only a small number of people who do not verify the security of their non-bank applications, the implication is that for most individuals to use the innovation the perceived risk must be low. Therefore, the crucial task for digital-only banks is to convince customers that they are trustworthy institutions, especially concerning security – when asking respondents about their concerns regarding digital-only banks most respondents indicated data security. This aspect was also emphasized by Windasari et al. (2022, p. 2), who wrote that “digital-only banks should convince their customer that they will experience the same level of service and reliability, even if the service is delivered digitally”.

Our study did not find support for personal characteristics such as place of residence, net income, education, and age, which stands in contradiction to some other studies (Al-Somali, Gholami, Clegg 2009; Gan et al. 2006; Szopiński 2016). It seems to be a very interesting observation that inhabitants of small towns and rural areas do not evince a lesser intention to use the services of a digital-only bank. However, the place of residence was also not an important factor in the studies of Albort-Morant, Sanchís-Pedregosa and Paredes (2022) or Onyia and Tagg (2011). The results of our study also showed that the net income, education and age of the customer does not necessarily correlate with the intention to use the services of a digital-only bank. Differences between the results of this study and comparable research can arise from a few reasons. Firstly, there are some personal characteristics, like net income, when the relationship might be non-linear. To a certain level of net income, the intention to use the services of a digital-only bank may increase, but after a certain threshold, people with very high income will prefer personal relationships and direct contact with a financial institution rather than chatbots and virtual banking (Shankar, Jebarajkairthy 2019). Secondly, differences may appear due to the very specific topic that was the subject of the survey as well as the population tested. Finally, it may also be a sign that due to the digital revolution that was accelerated by the COVID-19 pandemic, the differences between demographically diverse groups are vanishing. Some of the newest studies (Shahabi et al. 2021) have already provided support for the thesis that the outbreak of COVID-19 played a key role in changing social and cultural attitudes toward the acceptance and development of branchless banking. The results of this study might indicate that digital-only banks can now target a broader range of customers.

7. Conclusions

This paper examined the level of acceptance of digital-only banks by identifying potential opportunities and barriers to the development of this type of institution. It also verified the state of knowledge and awareness regarding digital-only banks.

It was proved that there is a positive relationship between knowledge and awareness and the intention to use the services of a digital-only bank. There is also positive relation between innovativeness and the consumers' intention to use the services of a digital-only bank; however, not all hypotheses were fully supported. No relationship was found between the perceived risk and the intention to use the services of a digital-only bank. The results obtained do not allow us to say that there is any correlation between place of residence, net income, education, age, and the consumers' intention to use the services of a digital-only bank. Taking into consideration the customers' perspective, we found that they perceive the main advantages of digital banks to be time-saving and convenience of use. As the main concerns, they indicated data security issues and concerns connected with the exclusion of elderly people and those without access to modern technology.

7.1. Theoretical and practical implications

The study carries several theoretical contributions. Firstly, this study focuses on a new model of a bank which is fully digital. There are still relatively few studies that try to analyse digital-only banks, especially from the perspective of consumers' intention to use the services of digital-only banks. The digital revolution accelerated by the COVID-19 pandemic creates an area for the development of these new institutions, therefore it seems to be crucial to understand the perspective of consumers which goes beyond mobile and online banking.

Secondly, it is important to note that this study was carried out in Poland, which represents a rapidly developing financial market. At the end of 2020, almost seventeen million people used mobile banking and more than nineteen million were active users of electronic banking (PRNews.pl 2021). Taking into consideration the fact that the total population of Poland is around thirty-eight million inhabitants,⁵ it means that half of the population uses digital channels for banking. Additionally, it should be noted that as of the end of 2020, there were almost 8.5 million mobile-only customers (those who operate their bank exclusively on mobile phones) in Poland (PRNews.pl 2021). That kind of markets create a great opportunity for the development of digital-only banks that can try to offer better financial services for all groups of consumers, thus increasing financial inclusion.

Finally, our findings are insightful and make an important contribution to the consumers' intention and adoption behaviour literature, especially in the context of innovative financial solutions.

Besides providing theoretical contributions, this study provides several practical implications for traditional banks as well as digital-only banks. Firstly, the results of the research conducted are relevant to companies that intend to enter the digital banking industry as we identify the main advantages and concerns regarding digital-only banks as well as verify the intention to use the services of digital-only banks from the perspective of knowledge and awareness, innovativeness and perceived risk.

Secondly, the variables that were found to be correlated with the intention to use digital-only banks can be used by them to create a strategy. Our results imply that great effort should be focused on communicating the advantages of such banks and their safety as people are not aware of the deposits guarantee and they confuse digital-only banks with FinTechs and payment platforms.

⁵ World Bank, *Population, total – Poland*, <https://data.worldbank.org/indicator/SP.POPTOTL?locations=PL> (access 20 December 2022).

7.2. Limitations and suggestions for future research

The limitations of the research may lie in the population selected for the survey as well as the time frame of the research.

Firstly, this study has been performed with the data from a particular geographical context (Poland). Although the data are of high quality, these results should not be generalised. The limitations regarding comparison of results between economics should be also considered. Although the banking sector in Poland is one of the most innovative parts of the economy, at the moment, consumers can access digital-only banks through Revolut Bank, Aion Bank, and Raiffeisen Digital Bank (which offers mainly online loans and is not exactly a digital-only bank, but rather a new brand of Raiffeisen Centrobank AG). Digital-only banks have a relatively short history in the Polish market (e.g. Aion was founded in 2021, as was Raiffeisen Digital Bank, with Revolut Bank offering a deposit guarantee since 2020). Therefore, the comparison of the results should be cautiously performed only among countries in the early stage of the development of digital-only banks.

Secondly, the CAWI survey was conducted during the COVID-19 pandemic, which causes us to wonder how the results would have been impacted by the outbreak of the pandemic and its consequences, i.e. fear of losing health and life resulting from leaving home, contacting other people, or using cash for payments (Goel et al. 2022).

Thirdly, taking into consideration the very early stage of the development of digital-only banks, it was very hard to use more advanced statistical methods. Most of the respondents have never used digital-only banks or even have never heard about this type of institution. Therefore, we needed to be extremely careful to avoid bias when preparing the questionnaire, conducting the research, and then analysing the results.

There are several avenues for future research. As far as the authors know, this is the first study that examines the interplay among constructs such as knowledge and awareness, innovativeness, perceived risk, and the intention to use the services of a digital-only bank. There is scope for replication of this research using samples of respondents in other geographical regions.

Second, considering the critical role that “knowledge” and “innovativeness” play in the willingness to use the services of a digital-only bank, it will be worthwhile to further investigate those areas. At the same within the next few years with the increase in the number of digital-only banks, future research can focus on customer engagement and enhancing customer lifetime value.

Finally, it is worth exploring where digital-only banks should look for a competitive advantage. As digital-only banks operate exclusively on online platforms and mobile applications, it is much harder for them to stand out in the market.

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The authors report there are no competing interests to declare.

Appendix

Table 1

Composition of the study group (in %)

Category	Description	N	%	Category	Description	N	%
Sex	Female	299	58.06		Unemployed	36	6.99
	Male	216	41.94		Student	28	5.44
Age	<=20	13	2.52	Work situation	Working	364	70.68
	21–30	104	20.19		Retired	87	16.89
	31–40	127	24.66	Place of residence	Village	90	17.48
	41–50	102	19.81		Town below 50,000 inhabitants	117	22.72
	51–60	88	17.09		Town of 50 to 15,000 inhabitants	98	19.03
	61–70	66	12.82		City of 150 to 500,000 inhabitants	106	20.58
	≥71	15	2.91		City above 500,000 inhabitants	104	20.19
Education	Primary	10	1.94	Average net income per person per household*	Less than 435 EUR	125	24.27
	Vocational	39	7.57		436–870 EUR	287	55.73
	Secondary	225	43.69		871–1,305 EUR	70	13.59
	Higher	241	46.80		1,306 EUR and more	33	6.41

* Net income was originally in Polish zloty. In order to convert it to euro we used the exchange rate from 31 December 2021. According to the Narodowy Bank Polski exchange rate table the exchange rate was EUR/PLN 4.5594.

Source: own calculations.

Table 2
Consumers' awareness of brand of digital-only banks

Statistics		Value
Observed	Successes ("no" answers)	340
	Attempts	515
	Rate	0.660
Standard error of the ratio		0.021
95% confidence intervals	Lower bound	0.618
	Upper bound	0.700

Source: own calculations.

Table 3
Consumers' knowledge and intention to use the services of a digital-only bank

Statistics	Do you know what FinTech is?	
	Yes	No
N	130	385
Average rank	325.220	235.300
Sum of ranks	42,278	90,592
U Mann-Whitney		16,287
Z		-6.192
p-value		< 0.001

Source: own calculations.

Table 4

Consumers' innovativeness (H3) and intention to use the services of a digital-only bank

Statistics	Do you use online banking?		Do you use mobile banking?	
	Yes	No	Yes	No
N	502	13	448	67
Average rank	259.870	185.810	268.690	186.510
Sum of ranks	130,454.500	2,415.500	120,373.500	12,496.500
U Mann-Whitney	2,324.500		10,218.500	
Z	-1.842		-4.382	
p-value	0.066		< 0.001	

Source: own calculations.

Table 5

Consumers' innovativeness (H4) and intention to use the services of a digital-only bank

Statistics	Value	
Spearman rho	0.414	
p-value	< 0.001	
95% confidence intervals	Lower bound	0.337
	Upper bound	0.485

Source: own calculations.

Table 6

Consumers' perceived risk and intention to use the services of a digital-only bank

	Do you verify the security of non-bank mobile applications?	
	Yes	No
N	170	11
Average rank	90.450	99.450
Sum of ranks	15,377	1,094
U Mann-Whitney		842
Z		-0.582
p-value		0.560

Note: This question was answered only by respondents who said that they have this kind of application. It was explained in the survey that the question refers to non-bank mobile applications used for financial purposes like budget management or payments.

Source: own calculations.

Table 7

Consumers' personal characteristics and intention to use the services of a digital-only bank

Statistics		H6	H7	H8	H9
Spearman rho		0.014	0.046	0.017	0.005
p-value		0.759	0.301	0.702	0.916
95% confidence intervals	Lower bound	-0.075	-0.043	-0.072	-0.084
	Upper bound	0.102	0.134	0.106	0.094

Source: own calculations.

Table 8
Results summary

Hypothesis	Variable tested	Supported or not
H1	Knowledge and awareness	Yes
H2	Knowledge and awareness	Yes
H3	Innovativeness	Partially yes (for online banking no, for mobile yes)
H4	Innovativeness	Yes
H5	Perceived risk	No
H6	Personal characteristics: place of residence	No
H7	Personal characteristics: net income	No
H8	Personal characteristics: education	No
H9	Personal characteristics: age	No
H10	Opportunities and barriers for development of digital- -only banks	Yes
H11	Opportunities and barriers for development of digital- -only banks	Yes

Source: own compilation.

Table 9

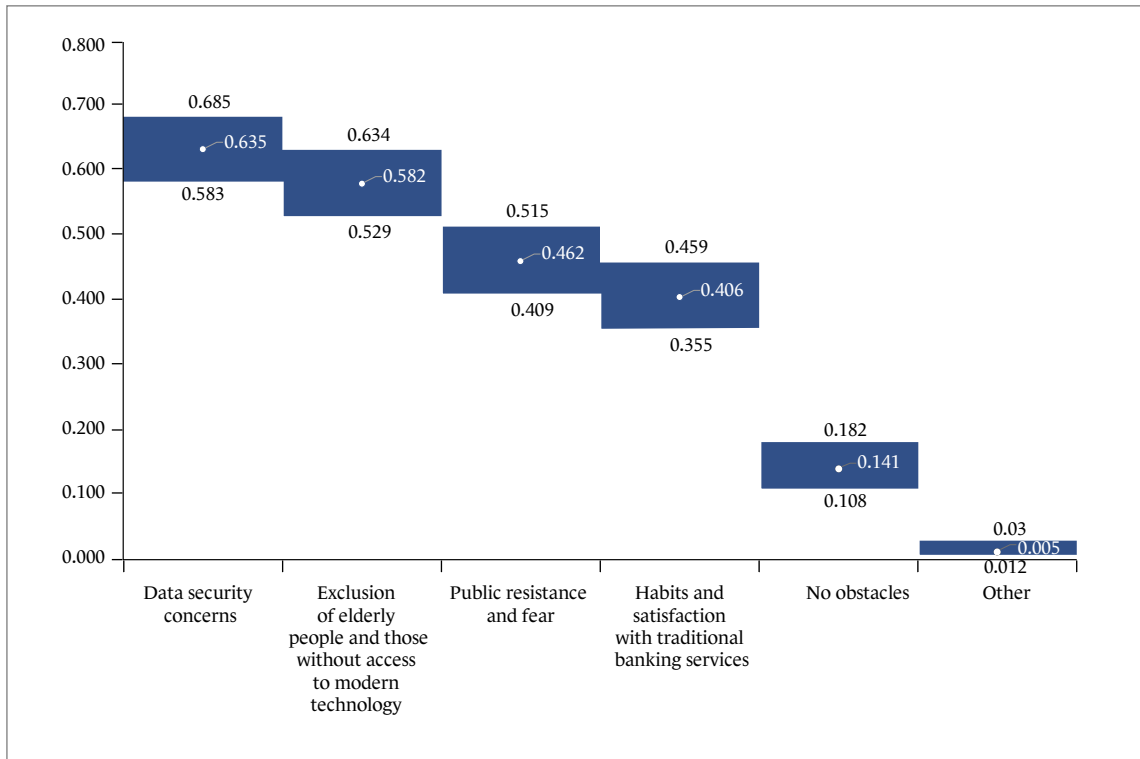
The set of chosen variables

No.	Variable	Hypothesis	References	Question
1	Knowledge and awareness	H1	Al-Somali, Gholami, Clegg (2009); Jiang (2009); Pal et al. (2021), Slade et al. (2015)	Do you know any brand of digital-only banks?
2	Knowledge and awareness	H2	Al-Somali, Gholami, Clegg (2009); Jiang (2009); Pal et al. (2021); Slade et al. (2015)	Do you know the term FinTech?
3	Innovativeness	H3	Slade et al. (2015); Thakur, Srivastava (2014); Windasari et al. (2022)	Do you use online banking? Do you use mobile banking?
4	Innovativeness	H4	Slade et al. (2015); Thakur, Srivastava (2014); Windasari et al. (2022)	Are you willing to use modern technological solutions offered by your bank or other financial company?
5	Perceived risk	H5	Jun, Palacios (2016); Mbama, Ezepue (2018); Pal et al. (2021)	Do you verify the non-bank application you use for safety?
6	Personal characteristics: place of residence	H6	Laforet, Li (2005); Lichtenstein, Williamson (2006); Albort-Morant, Sanchís-Pedregosa, Paredes (2022)	Place of residence
7	Personal characteristics: net income	H7	Jiménez, Díaz (2019); Lassar, Manolis, Lassar (2005); Stavins (2001)	Average net income per person per household
8	Personal characteristics: education	H8	Al-Somali, Gholami, Clegg (2009); Jiménez, Díaz (2019); Szopiński (2016)	Level of education
9	Personal characteristics: age	H9	Cham et al. (2022); Gan et al. (2006), Jiménez, Díaz (2019); Szopiński (2016)	Age
10	Intention to use	H1–H9	Alalwan et al. (2018); AbuShanab, Pearson (2007); Thakur, Srivastava (2014)	Would you like to use the services of a digital-only bank?

Source: own compilation based on literature.

Figure 1

Main concerns creating barriers to the development of digital-only banks

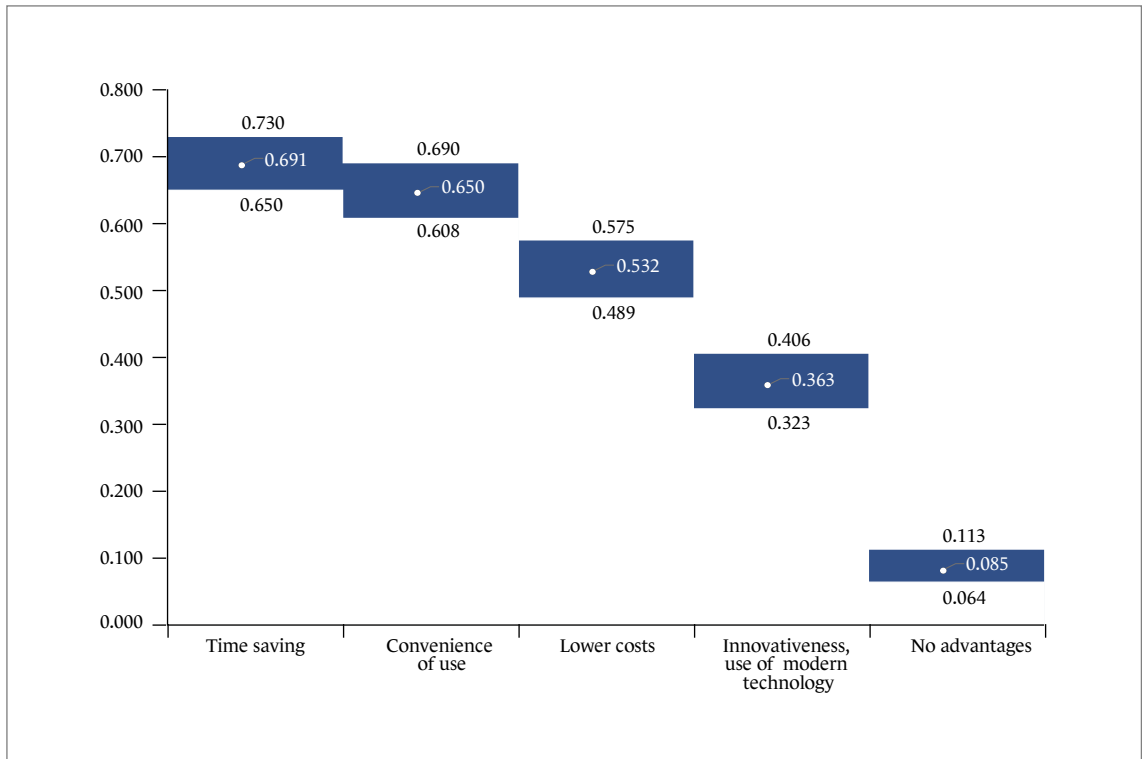


Note: the figure presents the 95% confidence interval calculated for each of the possible answers. We can say that the answers are equally important if the confidence intervals overlap.

Source: own compilation.

Figure 2

Main advantages creating opportunities to the development of digital-only banks



Note: the figure presents the 95% confidence interval calculated for each of the possible answers. We can say that the answers are equally important if the confidence intervals overlap.

Source: own compilation.

Świadomość i poziom akceptacji banków cyfrowych przez konsumentów

Streszczenie

Banki cyfrowe to instytucje, które zaczęły się dynamicznie rozwijać po globalnym kryzysie finansowym lat 2007–2009 w reakcji na postępujące zmiany i problemy tradycyjnego sektora bankowego. Są to instytucje finansowe, które działają na podstawie licencji bankowej i oferują swoim klientom usługi online za pośrednictwem strony internetowej lub aplikacji mobilnej. Powstały od podstaw lub ewoluowały z FinTechów i nie posiadają stacjonarnych oddziałów, filii czy biur. W ostatnich latach ten nowy model bankowości zaczął się szybko rozwijać na całym świecie, zwłaszcza w gospodarkach charakteryzujących się wysoko rozwiniętymi systemami finansowymi. W Wielkiej Brytanii powstała znaczna liczba banków cyfrowych, z których najpopularniejsze to Monzo Bank i Starling Bank. W Europie prym wiodą N26 i Revolut, a w Stanach Zjednoczonych klienci mogą skorzystać na przykład z Varo Bank. W Polsce koncepcja banku w pełni cyfrowego również pojawiła się w ostatnich latach, ale rozwój nowego modelu jest obecnie na wczesnym etapie.

Celem głównym badania jest zweryfikowanie poziomu akceptacji banków cyfrowych przez określenie potencjalnych szans i barier rozwoju tego typu instytucji, a także stanu wiedzy i świadomości dotyczącej banków cyfrowych. W ramach analiz sformułowano trzy pytania badawcze:

1. Czy istnieje związek między wiedzą i świadomością, innowacyjnością, postrzeganym ryzykiem a zamiarem korzystania z usług banku cyfrowego?
2. Czy istnieje związek między cechami demograficznymi (miejsce zamieszkania, dochód netto, wykształcenie, wiek) a zamiarem korzystania z usług banku cyfrowego?
3. Jakie, z perspektywy konsumenta, są główne atuty i obawy dotyczące banków wyłącznie cyfrowych, które mogą stwarzać szanse i bariery dla rozwoju tych instytucji?

Aby zrealizować cel główny, przeprowadzono badanie ankietowe wśród dorosłych mieszkańców Polski. Materiał empiryczny zebrano online (CAWI) w marcu 2022 r. Kwestionariusz został zbudowany w taki sposób, aby umożliwić weryfikację jedenastu hipotez badawczych, które skonstruowano w ramach trzech obszarów badawczych. Do weryfikacji hipotez wykorzystano testy statystyczne, w tym test U Manna-Whitneya, test istotności współczynnika korelacji rang Spearmana oraz 95-procentowy przedział ufności dla różnic.

Przeprowadzone analizy pozwoliły na stwierdzenie, że istnieje pozytywny związek pomiędzy wiedzą i świadomością a zamiarem korzystania z usług banku cyfrowego. Istnieje również pozytywny związek między innowacyjnością a zamiarem korzystania przez konsumentów z usług banku cyfrowego, jednak nie wszystkie hipotezy zostały w pełni potwierdzone. Nie stwierdzono związku pomiędzy postrzeganym ryzykiem a chęcią korzystania z usług banku cyfrowego. Uzyskane wyniki nie pozwalają stwierdzić, że istnieje jakakolwiek zależność między miejscem zamieszkania, dochodem netto, wykształceniem, wiekiem a chęcią korzystania przez konsumentów z usług banku cyfrowego. Stwierdziliśmy, że za główne zalety banków cyfrowych klienci uznają oszczędność czasu i wygodę korzysta-

nia. Obawy budzą głównie kwestie związane z bezpieczeństwem danych oraz z wykluczeniem osób starszych i niemających dostępu do nowoczesnych technologii.

Głównym ograniczeniem badania jest jego zasięg geograficzny. Wprawdzie sektor bankowy w Polsce jest jedną z najbardziej innowacyjnych części gospodarki, jednak obecnie konsumenci mają dostęp do stosunkowo niewielu banków cyfrowych, z relatywnie krótką historią. Z tego względu próby porównywania wyników powinny być przeprowadzane wśród krajów, w których banki cyfrowe znajdują się na wczesnym etapie rozwoju.

Słowa kluczowe: banki cyfrowe, bankowość wirtualna, FinTech, zachowania konsumentów, akceptacja innowacji

