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An Interplay Between Digital Banking Services, Perceived Risks, Customers' Expectations, and Customers' Satisfaction

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Abstract: Advancements in technology and emerging digital trends are driving the expectations of bank clients. With the development of new, innovative technologies, the banking sector has started creating new products and services and looking for new channels through which to offer those services in a way that meets customers' uplifted expectations. The aim of this paper is to explore several aspects of digital banking services, analyze user expectations, evaluate risks, and gauge how customers' expectations and perceived risks affect their satisfaction with these services. For that purpose, an empirical survey was conducted using an online questionnaire, obtaining 535 valid responses. This research showed that bank clients identified digital banking services as the most important factor when choosing a bank. Furthermore, the results of the study revealed which perceived characteristics and expectations of digital banking services create the highest levels of customer satisfaction in using digital banking services, and what types of perceived risks of using digital banking services should be mitigated.

Keywords: digital banking services; customers' expectations; digital banking risks; customers' satisfaction

Academic Editor:
Ramona Rupeika-Apoga

Received: 10 January 2025
Revised: 17 February 2025
Accepted: 20 February 2025
Published: 24 February 2025

Citation: Barjaktarovic Rakocevic, Sladjana, Nela Rakic, and Rade Rakocevic. 2025. An Interplay Between Digital Banking Services, Perceived Risks, Customers' Expectations, and Customers' Satisfaction. *Risks* 13: 39. https://doi.org/10.3390/risks13030039

1. Introduction

The emergence and development of digital technologies is one of those events that have made substantial changes in the needs, behavior, processes and channels of conducting business operations. All industries have experienced significant upheavals due to the impact of digital technologies.

Digital revolution has brought fintech, new innovative financial technology solutions, which completely disrupted traditional financial services (Marinkovic et al. 2022). Digital transformation is a process that does not relate only to external bank processes, but also those directed towards bank customers. An important segment of the digital transformation in banking is internal digitalization, making internal processes and operations digital. Internal digitalization of a bank should be adequately communicated to bank employees to ensure a clear and smooth transition. In their research, Kitsios et al. (2021) investigated the adoption of digital technologies among bank employees. Their aim was to reveal the perception of bank employees regarding new technologies.

The financial services sector has experienced significant ongoing disruption. Banks are also looking for solutions to meet the new needs of customers that have arisen from the extensive use of digital technologies. Banks are no longer alone in the banking services sector, with technology companies, start-ups, telcos, etc., as their new competitors. From conservative, rigid, closed institutions, banks have now become creative, innovative, and flexible. The only remaining constant is the central bank as the supreme regulator. However,

the regulation of banking services is changing all over the world and adapting to the new needs of customers.

Retail banking also faces tremendous changes. There are three urgent areas banks should focus on and proactively adapt: tech-powered transformation, data-enabled customer focus, and broad-based trust (Krijnsen et al. 2023).

Digital banking services offer a number of advantages over traditional banks, namely availability, mobility, time-saving, ease of access to services, autonomy in the relationship with the bank, reduction in banking service prices and increase in interest rates on deposits, online bill payment, knowledge about bank products, non-discrimination of technology, and environmentally friendly operations (Gargouri 2023).

Researchers have also highlighted the effect of digital banking on a bank's financial performance (Wadesango and Magaya 2020). Variables used were online customer deposits, online banking transactions, internet fees and commissions, and internet banking expenditure, while return on assets was used as a measure of financial performance. Bank performance is also measured as a cross-section of digitalization and sustainability in banking (Stefanovic and Barjaktarovic 2021). This research has shown that the level of investment in bank digitalization has a strong correlation with financial performance. Furthermore, some authors analyzed the perception of the complex interaction between digitization and operational efficiency and customer experience (e.g., Bueno et al. 2024).

In an attempt to reveal the reasons behind the use of digital banking services, the authors analyzed the influence of consumer's functional, psychological, and emotional barriers to the use of digital banking services (Santos and Ponchio 2021). Except for the influence of functional barriers, all other barriers positively influence the continued use of digital banking services (Nguyen 2020). Neves et al. (2023) examined the use of digital financial services such as digital banking, digital management payment services, and digital wallets. Their findings indicated that more money-oriented cultures tend to use these services more when perceiving them as easy to use.

Although digital banking services bring numerous benefits to bank customers, they have tremendously changed the way customers think and behave. In that view, banks need to hold customers' satisfaction and retain them with digital banking services (Kaur et al. 2021, p. 16). Digitalization has transformed banking operations, products, and services, and with increasing customer expectations, banks are developing innovative products and services to ensure customer satisfaction (Haralayya 2021).

The limited prior research on customer satisfaction with digital banking has mainly focused on the quality of online banking services (Gazi et al. 2024; Amin 2016), the speed of processing transactions (Muluka et al. 2015), or the way customer satisfaction influences retention rates within the bank (Bankuoru Egala et al. 2021). In this study, we argue that there are significant differences in customer satisfaction levels, keeping in mind some characteristics of digital banking services, risks associated with digital banking, and customer expectations of digital banking.

The main aim of this paper is to help understand the relationships between characteristics, perceived risks, customer expectations, and customer satisfaction with digital banking services.

To test the above predictions, we conducted a survey. The participants in the study were individuals with a bank account and some experience with digital banking services. The survey was sent to over 1000 email addresses in Serbia, ultimately obtaining 522 valid responses to be used for statistical data processing.

The findings are consistent with our theory. The statistical analysis of the influence of digital banking characteristics on customer satisfaction shows that time-saving, ease of use, and flexibility in terms of place and time of use lead to significant differences in customer

satisfaction levels. Results further show that the risk of personal and financial data safety, insufficient knowledge of digital banking, and risk of fraud lead to significant differences in customer satisfaction levels. Finally, results indicate that the observed expectations from the digitalization of banking services, more digital products and services, and new functionalities lead to significant differences in satisfaction levels between customers.

This study contributes to the body of literature on the topic in several ways. First, we add to the literature on digital banking services. We also contribute to research that attempts to understand customer satisfaction with digital banking services. Moreover, we analyzed in detail the risks associated with digital banking that lead to significant differences in customer satisfaction levels. Finally, we contribute to research on customers' expectations of digital banking and their influence on customer satisfaction.

Our study has several practical contributions. To increase customer satisfaction levels, banks should build trusting relationships while developing secure practices in digital banking. Bankers should inform customers about different opportunities and provide the necessary assistance. Digital infrastructure poses a challenge, especially in developing countries, but it is of utmost importance since costs, time-saving, simplicity, and flexibility lead to higher levels of customer satisfaction.

The remainder of this paper is structured as follows. Section 2 defines customer satisfaction, explains how digital banking services can lead to higher perceived customer satisfaction, and outlines a comprehensive hypotheses development process. Section 3 presents the design of the empirical survey. Section 4 presents the results from the tests of the hypotheses. Finally, Section 5 concludes this paper with an overview of the findings, the study's limitations, and directions for future research.

2. Literature Review

2.1. Customer Satisfaction in Digital Banking

A global survey has shown that consumers, in general, are very satisfied with the digital services offered by their banks. The global customer satisfaction rating has stayed at 4.16 (out of 5), according to (Statista Research Department Retrieved from Statista 2024). Every bank wants satisfied customers, since satisfied customers rarely file complaints and are overall more loyal to the bank (Unyathanakorn and Rompho 2014). This research presents a deeper understanding of the factors significant for an effective digital banking system that meets customer needs and expectations, leading to customer satisfaction and loyalty.

A solid understanding of all aspects of customer satisfaction in digital banking gives a bank a strong chance to secure an adequate market position. In this context, the bank should first understand the specifics of the different categories of its customers and discover the factors that lead to satisfaction with digital banking in each of the categories. Jahan and Shahria (2022) focus on the younger generation as a target group to find out their differential perception and to identify the most factors with the most influence on young customers' satisfaction and retention in mobile banking. Similarly, another research study (Ankit 2011) revealed the most influential factors that affect customer satisfaction in digital baking, with banking needs, core services, problem resolution, cost saved, convenience, and risk and privacy concerns, strongly affecting the overall satisfaction of digital consumers. In our research, we argue that the needs of customers are changing and that with each new generation it becomes more difficult for financial institutions and banks to meet customers' needs. This is precisely why there is a need for this type of research. Banks should focus on customers' satisfaction, keeping in mind an efficient and secure way of providing services.

Particular situations demand special attention and different perspectives. Customer levels of satisfaction with the quality of online banking services in the Islamic banking

sector, particularly after the COVID-19 pandemic, were the subject of research in Gazi et al. (2024). Study findings showed that several factors, including efficiency, dependability, responsiveness, and security, that impact customer satisfaction, with reliability as the most critical factor, have had the greatest impact on customer satisfaction after COVID-19.

Customer satisfaction is significantly influenced by the speed of transactions (Muluka et al. 2015). This research revealed that customers were more confident when digital banking offered considerable speed of processing transactions and concluded that the speed of transactions influenced customer satisfaction.

Customers' satisfaction affects loyalty and retention rates. The more satisfied customers are with digital banking services (measured by ease of use, efficiency, privacy/security, and reliability), the more satisfied they are and the higher the retention rate is (Bankuoru Egala et al. 2021).

Mbama and Ezepue (2018) have examined customer perceptions of digital banking, customer experience, satisfaction, loyalty, and financial performance. The study has shown that the main factors that determine customer experience in digital banking are service quality, functional quality, perceived value, employee–customer engagement, perceived usability, and perceived risk. Finally, the results say that there is a significant relationship between customer experience, satisfaction, and loyalty, which is related to the financial performance of the bank.

The research shows that a bank should be able to deliver the right content at the right time in order to satisfy its customers. The best channels for communicating with customers for the banks are advertising, SEO, drip campaigns, social media, etc. (Kaur et al. 2021, p. 15). The banking sector has an obligation to its customers to ensure transparency and timely communication. Certain challenges, especially in difficult times, can only be overcome through joint efforts and trust in the system. As a result of a quality relationship between banks and clients, customers' satisfaction and long-term cooperation will be guaranteed.

In this research, customer satisfaction is defined as the gap between customer expectations and the service that they receive. If expectations are high and the performance is low, then customer satisfaction cannot be achieved (Kurniawan et al. 2020; Wiharso et al. 2022). Furthermore, Armstrong et al. (2014) argue that customers create expectations based on various market offers and choose products or services according to those expectations.

Expectation confirmation theory is based on expectations which, coupled with perceived performance, lead to satisfaction. If a product or service outperforms expectations, then satisfaction will result (Baharum and Jaafar 2015). Expectation confirmation theory is based on four main constructs: expectation confirmation, perceived usefulness, satisfaction, and continuance intention (Rahi and Ghani 2019). Amin (2016) showed that the relationship between banking service quality, satisfaction, and loyalty is significant. Therefore, the goal of this research is to analyze factors that influence customer satisfaction. More precisely, in the remainder of this paper, the relationships between the characteristics of digital banking services, perceived risks, customer expectations, and customer satisfaction with digital banking services will be explained in detail.

The limited prior research on customers' satisfaction with digital banking has mainly focused on the quality of services and conditions for the operational implementation of online products and services. Our work offers a better understanding of the characteristics of digital banking that affect customer satisfaction.

2.2. Digital Banking Characteristics (Lower Costs, Time Savings, Simplicity, Flexibility)

Nothing has ever had such an impact on banking services as the use of digital technologies. Innovative technologies have changed the business model of banks to such an extent

that they have completely disrupted it. The application of innovative technologies and digitalization is not new, since the use of the Internet and smartphones in banking services has been around for decades (Kaushik and Rahman 2015). With the growing number of users of smartphones and the internet generally, numerous online and mobile banking platforms have been developed for those users, resulting in an increasing and dominant position of retail banking in the digital banking revolution (Wewege and Thomsett 2020).

With the fast adoption of innovative technologies, the banking sector also "welcomed" several new players coming not just from the financial services sector. Although the banking industry has always been heavily regulated, with severe limitations of entry into the industry, there has been a noticeable relaxing of access restrictions nowadays (Wewege 2017, p. 13). Disruptive new players have entered the banking industry, like financial technologies (FinTech) start-ups, but also other non-financial and non-banking companies that use new technologies to offer new products and services in payments, investments, financing, etc. (Gasser et al. 2018). All these changes have, in some way, destabilized the financial system, but on the other hand, they have offered new opportunities for meeting customers' needs and increasing their satisfaction.

Despite being very formal in its nature, the banking industry has been forced by innovative, digital technologies with their disruptive impact to start thinking and behaving unconventionally and differently from before (Revathi 2019). The importance of digital banking will continue to grow further in the future (Barjaktarović Rakočević et al. 2022). We believe it is very important to examine what factors are most important in terms of customers' satisfaction and what banks should focus on in the future. In some ways, the banking sector has an obligation to adapt to new trends, especially in order to achieve customers' satisfaction.

With digital natives, banks need to trade their fundamentally physical structure for an electronic-based structure with electronic and physical levels on top (Skinner 2014, pp. 46–8). It is not just technology that changes the banking landscape today. Regulation, new competitors, and consumer attitudes and behavior strongly influence transformation processes in banking (Omarini 2022). Nevertheless, when talking about the transformation of digital banking, many banks assume that it is about workflow and processes and disregard customer experience (Indriasari et al. 2019).

To succeed in a competitive landscape, digital banks must adopt flexible platform strategies to adapt to changing market conditions. Utilizing scenario planning as a strategic tool enables them to anticipate and refer to challenges like technological disruptions, regulatory changes, and evolving customer demands (Andari and Novani 2024).

The process of digitalization brought significant benefits in reducing financial costs for individuals, households, and enterprises, but also for the bank as shifting operations digitally reduces operating costs and the number of physical locations, consequently reducing the number of employees (Kozak and Golnik 2020). Therefore, we want to see how lower costs and time savings affect customer satisfaction. In this paper, we expect that lower costs and saved time lead to significant differences in customers' satisfaction levels.

The digitalization of banking services has raised the bar in terms of simplicity and convenience. This is very important to generations of digital users, that is, it is a sine qua non for them. Abdurrahman (2024) concluded that consumers believe that digitalization, with its ease of use or simplicity, improves their banking experience considerably. Abdennebi's (2023) focus was on m-banking (mobile-banking) services and their adoption, since smartphones are increasingly present worldwide, creating a cost-effective, convenient, and flexible channel to consume banking services digitally. Perceived ease of use, as one of the characteristics of mobile banking, is one of the elements that affect mobile banking adoption, since the ease of use of mobile banking will lead to more efficient banking transactions

(Akturan and Tezcan 2012). Similarly, research on users from the millennial age group also confirms previously stated findings (Rahman et al. 2024). Although millennials today require faster solutions and represent a driving change, in this research it was important to point out how the simplicity of services and flexibility of use contribute to customers' satisfaction. We believe that banking services that are easy to use and can be personalized in some way make a significant difference in customers' satisfaction.

Having all previously mentioned points in mind, user satisfaction with digital banking services will be influenced by digital banking characteristics. This led to the first hypothesis.

Hypothesis H1: *The observed characteristics of digital banking services (e.g., costs, time-saving, simplicity, and flexibility) lead to significant differences in customer satisfaction levels.*

2.3. Risks of Digital Banking

Even though digital banking has numerous benefits for its users, as mentioned in the previous section (time-saving, cost reduction, ease of use, flexibility), there are also perceived risks. With the growing number of online transactions, potential threats are rising, most of them coming from the security of transactions and possible frauds of identity issues, thefts, and accounts being stolen.

In their study, Saputra et al. (2022) have addressed the operational risks of digital banking services. Those operational risks are perceived as system failures, and downtime and timeout services used to fix the system problem. This study has also tried to estimate maximal potential loss from these operational risks in digital banking transactions.

A substantial threat to digital banking transactions, mainly made via mobile phones, computers, and tablets, comes from cyber security issues. Online transactions and online banking generally demand secure connections and protocols that will provide trustable identification of clients. To prevent cyber security threats and to provide security to their clients, banks must create an efficient system of security with several layers of authentications, verifications, and data encryption (Alzoubi et al. 2022). We believe that only when customers are not worried about the security of the system can they use banking products and services in the right way and thus become satisfied. This should be a mutual goal, and in this paper, we investigate whether certain risks make a difference in terms of customers' satisfaction.

There are papers that have examined whether cybersecurity threats and risks have an influence on the adoption of digital banking (Cele and Kwenda 2024). Analyzing the vast literature on cybersecurity in digital banking and ways to mitigate cybersecurity risks and counter the threats, the authors of this study have sublimated the possible preventive tools and grouped them into several categories such as applying vigorous security techniques and enhancing education and awareness among bank clients.

Many studies observe cybersecurity issues in digital banking. One study (Sechar and Kumar 2023) states that, compared to other sectors, the banking sector is faced with more cyber-attacks, and fifty percent of those attacks are related to ATMs, debit cards, and net banking.

Identity theft or theft of data stored in a cloud is a vital concern for the users of digital banking services (Ghelani et al. 2022), and this research focuses on creating a banking system model that uses machine learning, data learning, biometric recognition, etc., in which biometric impressions and digital signatures secure every transaction made by a bank's customer.

Recently, as a response to cyber-attacks in the digital banking sector, there have been propositions that engage sophisticated AI solutions. One such model has been presented in research that uses machine learning to predict loan acceptance and identify deceptive

credit card transactions (Nuthalapati 2023). Stanikzai and Shah (2021) have been trying to evaluate existing solutions for preventing and fighting cyber-attacks, but also to make potential enhancements. We strongly believe that AI solutions will have a significant impact on customers' satisfaction and that customers' satisfaction levels depend on how the banking sector will address new challenges.

Banks see cybersecurity and data privacy as crucial in achieving competitive advantage in the digital banking area. Wang et al. (2024) conducted research on challenges banks have faced in mitigating and reducing cyber security risks and the technologies they implement and strategies they use to reduce this risk.

Even though digital technologies are increasing the volume of digital banking operations, they also pose severe threats to security and numerous challenges that relate to technology usage. Uddin et al. (2023) emphasize that banks feel great competition, mainly from fintech companies and fintech startups, and as response, "to stay in the game" spend more on cyber security and consequently become more exposed to operational risks. With rising levels of operational risks and the necessity to mitigate and reduce them, banks should be transparent regarding the types of cyber-attacks they face. One study (Asmar and Tuqan 2024) revealed that the main cyber threats digital banks are exposed to are insider threats, distributed denial of service (DDoS) assaults, ransomware, phishing attacks, and social engineering. Also, they emphasize the significance that machine learning has in the defense against cybersecurity attacks.

Operational risk is not element that has been analyzed in the context of the digital transformation of banks. In a recent study (Hoque and Le 2024), the authors investigated how banks' digital transformation affects three types of risks: credit risk, risk of insolvency, and liquidity risk. If we go further, empirical results from Fan et al. (2024) point out that digital transformation notably lowers the systemic risk of banks in two ways: improving the operational efficiency of banks and cutting bank risk-taking. Although there are a large number of studies that address risks in digital banking, there is insufficient evidence to show how major technological changes that result in increased risks affect customers' satisfaction. Additionally, given the limited results of all the aforementioned studies, we attempted to link perceived risks by customers with their satisfaction level in order to determine which risks banks should specifically focus on in order to achieve desired customer satisfaction with digital banking products and services.

Risk in digital banking increases as digital operations in banks increase in volume, leading to threats posed to customer satisfaction. This helped us formulate the next hypothesis.

Hypothesis H2: *The perceived risks associated with digital banking lead to significant differences in customer satisfaction levels.*

2.4. Customers' Expectations of Digital Banking

Customer service expectations are continually reaching new heights (Moorthi and Mohan 2017). The digital world has created new patterns of customer expectations and behavior in every industry, banking in particular. Banks are not the sole providers of banking services, since new players, e.g., fintech companies are here to stay. Banks must answer the question of whether they can meet customers' expectations in the future and create tailor-made products and services, or whether other players would be more successful in taking their place.

For the banks, it is of the highest importance to understand customer expectations and to improve customer experience accordingly. Nancyprabha and Sivakumar (2020) have created a research framework that elaborates on this issue.

Digitalization has pushed customer expectations of banking products and services further. Today, a bank's customer wants immediate service and extremely convenient digital solutions that are accessible 24/7 at a low price and of the highest safety. And banks must keep up with those changes, or they will become irrelevant. Kasturi (2023) examines how customer demands are driving innovation in the banking industry and identifies potential bank strategies regarding competition and partnerships.

Aitken et al. (2021) went further and examined public expectations of digital innovations in banking. Their findings show that intentional forms of public engagement are valuable opportunities to incorporate various inputs and to enable critical reflection on the innovation path in banks.

Customer expectations of digital banking services are also influenced by generation affiliation, and there has also been research in that context. Windasari et al. (2022) have examined factors affecting digital banking services among Generation Y and Z. The results show that these generations expect economic value, ease of use, social influence, firm reputation, promotion, and reward as important incentives to use digital banking. Due to the high expectations of the younger generation, it is very difficult to retain customers in the long term. Banks must invest a lot of resources in communication channels to keep customer satisfaction at the desired level.

Special attention in academic literature is also given to elderly people. One study (Sinha and Singh 2023) focused on how elderly bank customers use mobile banking services. These authors also attempted to create a model to measure the impact of the use of digital banking on their long-term satisfaction and continued intention to use it. When it comes to older generations, our main assumption is that trust in the banking sector is based on fulfilled expectations in terms of data and transaction security.

The stronger presence of AI in the business environment has brought extensive research to light, which examined the development of digital banking with the help of AI. Research by Alnaser et al. (2023) has created an integrated framework for a model to validate customer expectations and a model that examines customer acceptance and satisfaction with AI-supported digital banking. Also, Bhatnagr and Rajesh (2024) have analyzed the impact of AI characteristics on bank customers' satisfaction, specifically on Gen Y and Gen Z, and the potential different uses of AI for these two groups of bank customers. Similar research by Bhatnagr et al. (2024) examined customers' continual intention to use digital banking in the context of AI. This research tried to show the effectiveness of AI-enabled digital bank services.

With the aim of improving the customer experience of banks, a research study (Chauhan et al. 2022) proposes a customer experience framework that banks can use to improve their digital presence. The authors of this study also suggest banks could use this framework to advantageously place "game-like features" in their digital platforms. To improve customer experience, this study fills the gap in recognizing the use of "gamification" in technology-driven banking services.

The agile method has also been researched in the field of digital banking services. One study (Ogundipe et al. 2024) focuses on agile methodologies and investigates their potential to enhance customer satisfaction in digital banking. Agile development enables banks to rapidly introduce new features and functionalities, aligning with changing customer expectations. This approach empowers customers with faster access to cutting-edge solutions tailored to their financial requirements. The outcome is a seamless, user-centric digital banking experience that fosters innovation and efficiency. Although it would be interesting to see the expectations of customers who belong to different age groups, for the purposes of this research we focused on considering how, in general, customers' expectations affect customers' satisfaction. The limited prior work on customers' expectations from digital

banking has mainly focused on accessible digital solutions at a low price and of the highest safety. In this study, we argue that there are significant differences in customers' satisfaction levels when considering customers' expectations of digital banking.

Having in mind the literature review on customer expectations of digital banking and customer satisfaction with digital banking, the following hypothesis is modeled.

Hypothesis H3: *Perceived customers' expectations of digital banking lead to significant differences in the levels of perceived customers' satisfaction in digital banking.*

3. Methodology

This paper is a follow-up to previous research published in Barjaktarović Rakočević et al. (2022). That paper focused on customers' perspectives on digital banking services in Serbia. The research examined factors that influence customers' intention to use digital banking services. Since the focus of that research was the demographic characteristics of bank customers and their intention to use bank digital services, the research was descriptive in nature. For future research, the authors agreed to focus on a more comprehensive analysis to identify factors that have a significant influence on consumers' satisfaction with digital banking services.

The work on this topic involved empirical research. An online questionnaire was created to analyze the expectations of users regarding digital banking and their satisfaction with digital banking services. The participants in the study were individuals with a bank account and some experience with digital banking services. For the pilot testing, the questionnaire was sent via email to 30 people who have significant experience with digital banking services and who have been using them for more than a year. The pilot testing was performed to validate the questionnaire, and the results confirmed that it was clear and understandable and that the questions were logically structured and unambiguous. The questionnaire was then sent to over 1000 addresses in Serbia. Eventually, 522 valid responses were obtained that could be used for statistical data processing.

Data were processed using IBM SPSS 20.0, which runs under the Microsoft Windows environment. The results are presented graphically and in tables. In addition to descriptive statistics, inference statistics were also applied. To determine the differences in the levels of satisfaction among customers in terms of the characteristics of digital banking services, the risk of digital banking, and the expectations of digital banking, an analysis of variance was used. This is a parametric method applied to continuous data when the results are normally distributed and independent and when we are examining the differences between three or more groups. In research, it is often used to check that there are differences between more than two arithmetic means of the same or different basic sets. The statistical procedure for these studies is known as the analysis of variance (ANOVA). Statistician and geneticist Ronald Fisher coined the term in 1918 and developed the method of analysis of variance in 1925 (Fisher 1925). Analysis of variance consists of examining the variability of arithmetic environments from several randomly selected samples, whereby the total variability (total variance) is separated into its constituent parts, that is, the variability that arises because of the treatments applied and the random variability.

One-factor analysis of the variance of different groups is a method that allows the variance in the results of research to be divided into parts, whereby they can be related to some known cause, source, or factor. With this method, it is possible to estimate the magnitude of the variance explained by a factor and estimate whether that part of the variance is greater than expected based on the null hypothesis. The simplest form of analysis of variance is univariate analysis of variance. It is intended to test the existence of differences between the arithmetic means of more than two subpopulations on some

continuous variable. This method helps determine whether the observed differences are the result of chance or reflect real, significant differences. A one-way ANOVA uses a single independent variable.

The one-way ANOVA is used to determine whether there are any statistically significant differences between the means of three or more independent groups. We used one-way ANOVA in our paper because we have a single independent variable, and our goal is to investigate if variations or different levels of that factor have a measurable effect on our dependent variable, customer satisfaction.

4. Results and Discussion

This section presents an overview of the research results. First, we present the socio-demographic data of the respondents. The frequency analysis reveals that there is an almost uniform distribution between respondents according to gender, 56.5% were male and 43.5% were female. This means that there is no gender disproportion in the usage of digital banking services. Regarding age classification, the majority of the respondents are in the age group of 36–45 years (42.5% of all respondents). Most of the respondents have a bachelor's level of education (46%). Almost 60% of respondents are employed in the private sector, and most of them have a monthly salary of over RSD 100,000. Table 1 outlines the demographic structure of the respondents.

Table 1. Socio-demographic data of respondents.

Demographic Variables	Categories	Frequencies	Percentages
Gender	Male	295	56.5
	Female	227	43.5
	Total	522	100.0
Age groups (in years)	Below 25 years	24	4.6
	25–35 years	172	33.0
	36–45 years	222	42.5
	46–55 years	88	16.9
	56–65 years	14	2.7
	Above 65 years	2	0.4
	Total	522	100.0
Education	High school	65	12.5
	Bachelor	240	46.0
	Master	204	39.1
	PhD	13	2.5
	Total	522	100.0
Occupation	Founder/owner of the company	50	9.6
	Private practice (self-employed)	54	10.3
	Financial sector	62	11.9
	Public sector	39	7.5
	NGO	25	4.8
	Private sector	292	55.9
	Total	522	100.0
Monthly salary in RSD	Below RSD 40,000	10	1.9
	RSD 40,000–60,000	22	4.2
	RSD 60,001–80,000	45	8.6
	RSD 80,001–100,000	57	10.9
	Over RSD 100,000	373	71.5
	(blank)	15	2.9
	Total	522	100.0

Source: Authors' data retrieved from Barjaktarović Rakočević et al. (2022).

Figure 1 shows the distribution of the responses to the question: *What is crucial for choosing a bank to open an account?* Respondents were offered five factors: *proximity to the branch*, *transaction and account management costs*, *favorable lending conditions*, *developed digital banking services*, and *ATM location*. Participants rated the importance of each indi-

vidual factor on a five-point scale, from 1 (very unimportant), 2 (unimportant), 3 (neutral), 4 (important), to 5 (very important).

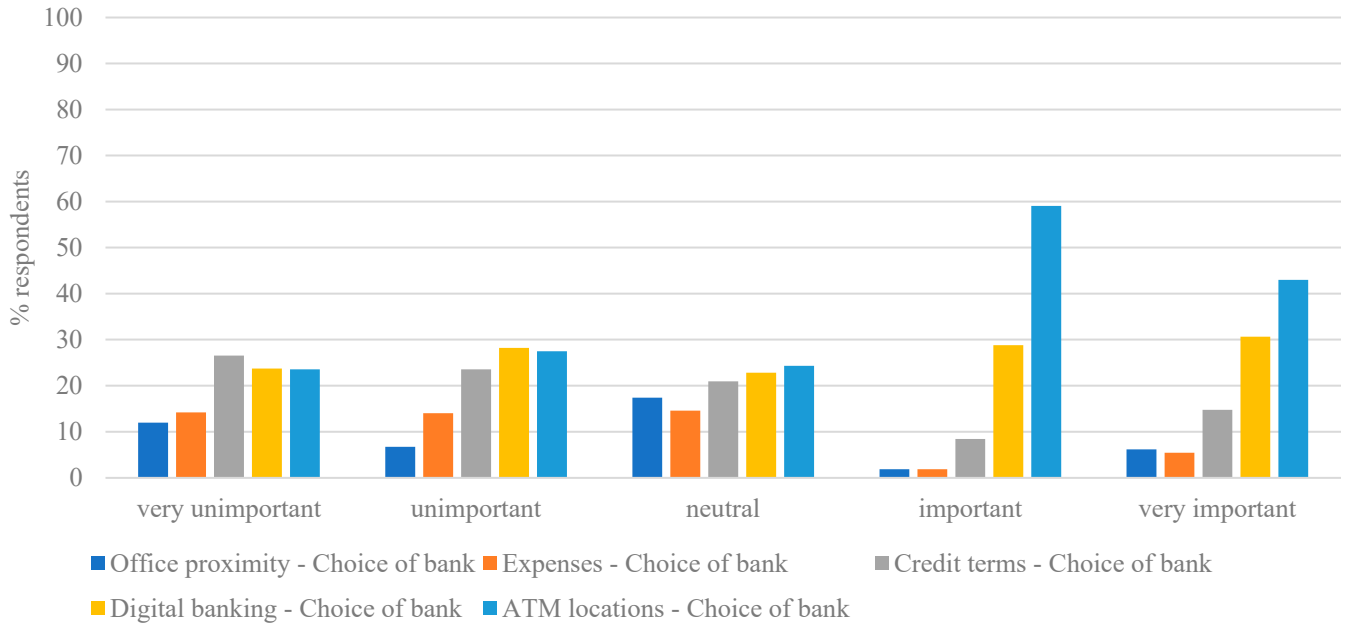

Figure 1. Distribution of answers to the question *What is crucial for choosing the bank to open an account* regarding five factors: proximity of the branch, transaction and account management costs, favorable lending conditions, developed digital banking services, and ATM location. Source: Author's research.

Looking at Figure 1, the *proximity of the branch* is very important for a quarter of the respondents, the same number finds it important, another quarter has a neutral attitude, and the last quarter assesses this factor as unimportant or very unimportant. So, every second respondent assesses this factor as important, but the number of those who are undecided is not to be overlooked either.

The *costs of transactions and account management* are considered by about 55% of the respondents to be very important and important; a quarter have a neutral attitude, while one in five respondents consider this factor to be unimportant and very unimportant.

For a quarter of respondents, *favorable loan conditions* are very important when choosing a bank; for the same number they are important, one in five respondents is neutral, and for every third respondent, this factor is irrelevant or very unimportant.

By reviewing Figure 1, it can be stated that about 60% of respondents assess the *developed digital banking services* as very important when choosing a bank: 30% as important, 8% have a neutral attitude, while a minority consider them unimportant (4%). It can be said that this factor is the most important.

From Figure 1, it can be stated that about 75% of respondents assess the *location of ATMs* as very important or important when choosing a bank; 15% have a neutral attitude, while every tenth respondent evaluates this factor as unimportant or very unimportant.

If we look at the previous five factors that were considered when choosing a bank (*proximity to the branch*; *transaction and account management costs*; *favorable lending conditions*; *developed digital banking services* and *ATM location*), we can conclude that the respondents saw the newly developed *digital banking services* as the most important factor when choosing a bank. Out of the total number of respondents, 60% of them chose *digital banking services* as a very important factor for bank selection, which is almost 20% more than the next important factor (*ATM location*). If we consider the respondents for whom *digital banking services* are important, then the percentage rises to almost 90%. These results are consistent with several previous digital banking studies (Kaur et al. 2021; Rakočević and Rakić 2023;

Melnychenko et al. 2020; Kaushik and Rahman 2015; Nguyen 2020). Although Nguyen (2020) used the attitude towards the service as the main dependent variable, the results of this study are in line with our findings. Nguyen (2020) found that (1) attitude towards the service has a positive impact on the intention to use, (2) convenience does not affect the intention to use digital banking services, (3) perceived usefulness factor has a positive effect on the attitude towards the service, (4) the perceived risk has a negative impact on the attitude towards the service, (5) trust has no effect on the attitude towards the service, (6) ease of use has a positive impact on perceived usefulness, (7) trust has a positive effect on perceived risk.

The next part of the paper focuses on testing research hypotheses. The results of the one-factor analysis of variance are presented.

Hypothesis H1: *The observed characteristics of digital banking services (e.g., costs, time savings, simplicity, and flexibility) lead to significant differences in customer satisfaction levels: has been partially confirmed.*

Table 2 presents a comparison of three groups of respondents according to satisfaction with the use of digital banking services (group 1—dissatisfied; group 2—satisfied; group 3—very satisfied) in terms of assessing the importance of digital banking services' features.

Table 2. Customer satisfaction levels in terms of the observed characteristics of digital banking services.

		Sum of Squares	Df	Mean Square	F	*p*
Lower costs	Between Groups	6.011	2	3.006	1.596	0.204
	Within Groups	992.217	527	1.883		
	Total	998.228	529			
Time-saving	Between Groups	3.750	2	1.875	3.261	0.039
	Within Groups	302.997	527	0.575		
	Total	306.747	529			
Use simplicity	Between Groups	7.258	2	3.629	4.562	0.011
	Within Groups	419.225	527	0.795		
	Total	426.483	529			
Flexibility of time and place	Between Groups	7.964	2	3.982	6.040	0.003
	Within Groups	347.434	527	0.659		
	Total	355.398	529			

Notes: df—degrees of freedom; F—statistic; *p*—statistical significance. Source: Author's calculations.

Based on the ANOVA, we can see that the results indicate that there are no statistically significant differences in customer satisfaction in terms of assessing the importance of the lower costs feature of digital banking services ($F(2,527) = 1.596$, $p = 0.204$). Digital banking in Serbia is listed in Appendix A, Figure A1 in Appendix B lists the average scores of the characteristics of *Lower Cost services* according to customer satisfaction with the use of digital banking services.

The results of the ANOVA indicate that there are statistically significant differences between customer satisfaction in terms of assessing the importance of the *Time-saving* feature of digital banking services ($F(2,527) = 3.261$, $p = 0.039$). Subsequent tests for multiple comparisons (Tuckey HSD) found that the respondents who were dissatisfied differed statistically significantly in assessing the importance of saving time ($M = 4.51$) compared to those who were satisfied ($M = 4.73$). More satisfied customers rate this feature as more

important. Figure A2 in Appendix B presents average scores characteristics of *Time-saving services* according to customer satisfaction with using digital banking services.

In addition, statistically significant differences were found between respondents in terms of assessing the importance of the feature *Use simplicity* ($F(2,527) = 4.562$, $p = 0.011$). Subsequent tests for multiple comparisons (Tuckey HSD) found that respondents who were dissatisfied differed statistically significantly in terms of assessing the importance of the characteristic (M = 4.26) compared to those who were satisfied (M = 4.53) and very satisfied (M = 4.60). More satisfied respondents rate this feature as more important. Figure A3 in Appendix B displays average scores of the *Use simplicity* service characteristics according to customer satisfaction with the use of digital banking services.

Furthermore, statistically significant differences were found between respondents in terms of assessing the importance of the characteristics *Flexibility of time and place* ($F(2,527) = 6.040$, $p = 0.003$). Subsequent tests for multiple comparisons (Tuckey HSD) found that respondents who were dissatisfied differed statistically significantly when assessing the importance of the characteristic (M = 4.34) compared to those who were satisfied (M = 4.66) and very satisfied (M = 4.64). More satisfied customers rate this feature as more important. A display of average scores of the characteristics of *Flexibility of time and place* services according to customer satisfaction with the use of digital banking services is given in Figure A4, Appendix B.

The results of the statistical analysis have confirmed the H1 hypothesis in terms of assessing the importance of digital banking characteristics—*Time-saving*, *Use simplicity*, and *Flexibility of time and place*. However, it has not been confirmed in terms of *Lower costs*. Such results indicate that time-saving characteristics, ease of use of digital banking services, and flexibility in terms of the use of services in relation to place and time lead to significant differences in customer satisfaction levels. Those results are similar to and consistent with several previous papers (Pavithra and Geetha 2021; Abdurrahman 2024; Abdennebi 2023; Akturan and Tezcan 2012; Rahman et al. 2024).

Pavithra and Geetha (2021) found that respondents of various age groups prefer digital banking over traditional and that, generally, customers are satisfied with digital banking services. Abdennebi (2023) extended the Technology Acceptance Model by introducing trust, satisfaction, and perceived security. According to Abdennebi (2023), satisfaction is a complex emotional response to a consumption experience, and a precondition for positive customer satisfaction is their rich experience with digital banking services. This result is in line with our findings. Additionally, Kaur et al. (2021) filled the gap in the literature on understanding the intensity of the risk factors that influence customers' satisfaction. They found that customers are satisfied with the quality of digital banking services, which is in line with our findings. For users of banking services in Serbia, the lower cost of using digital services is a factor that, compared to other characteristics, does not affect the level of satisfaction when using digital banking services. The reason for this might be that the costs of using digital services are generally the same for all banks, as defined by the central bank. Our assumption is that they are generally not criteria for choosing a bank and, therefore, do not affect customers' satisfaction. Additionally, a possible explanation may be that the costs of maintaining a bank account do not change depending on whether customers use digital banking services or not.

Hypothesis H2: *The perceived risks associated with digital banking lead to significant differences in customer satisfaction levels: has been confirmed partially.*

Table 3 presents a comparison of three groups of respondents according to the impact of digitalization of products and services on bank satisfaction (group 1—does not affect; group 2—affects; group 3—affects a lot) in terms of assessing the perceived risks of digital banking services.

Table 3. Comparison of three groups of respondents (satisfaction with the use of digital banking services) in terms of assessing the perceived risks of digital banking services.

Risks		Sum of Squares	Df	Mean Square	F	*p*
Safety of personal and financial data	Between Groups	10.883	2	5.441	3.188	0.042
	Within Groups	908.070	532	1.707		
	Total	918.953	534			
Insufficient knowledge of digital banking	Between Groups	12.376	2	6.188	4.088	0.017
	Within Groups	805.194	532	1.514		
	Total	817.570	534			
Nonfunctional app	Between Groups	3.326	2	1.663	0.944	0.390
	Within Groups	936.868	532	1.761		
	Total	940.194	534			
Risk of fraud	Between Groups	11.447	2	5.724	3.623	0.027
	Within Groups	840.523	532	1.580		
	Total	851.970	534			
Regulatory restrictions risk	Between Groups	0.882	2	0.441	0.283	0.753
	Within Groups	827.967	532	1.556		
	Total	828.849	534			

Notes: df—degrees of freedom; F—statistic; *p*—statistical significance. Source: Author's calculations.

The results of the ANOVA test indicate that there are statistically significant differences between customer satisfaction in terms of risk assessment of digital banking services—*Safety of personal and financial data* (F(2,532) = 3.188, $p = 0.042$). Subsequent tests for multiple comparisons (Tuckey HSD) found that customers who state that digital banking affects bank satisfaction differ statistically significantly in terms of assessing the stated risk (M = 3.21) compared to those who state that it affects bank satisfaction (M = 2.89). Customers who are more satisfied with the bank estimate the risk to be lower. Figure A5 in Appendix B presents average scores of the characteristic *Safety of personal and financial data* according to user satisfaction with the impact of digitalization of products and services.

Also, statistically significant differences were found between customer satisfaction in terms of risk assessment of digital banking services and *Insufficient knowledge of digital banking* (F(2,532) = 4.088, $p = 0.017$). Subsequent tests for multiple comparisons (Tuckey HSD) found that respondents who state that digital banking affects bank satisfaction differ statistically significantly in terms of assessing the stated risk (M = 2.83) compared to those who state that it affects bank satisfaction (M = 2.49). Customers who are more satisfied with the bank estimate the risk to be lower. Figure A6 in Appendix B displays average scores for *Insufficient knowledge of digital banking* characteristics according to user satisfaction with the impact of digitalization of products and services.

The results of the ANOVA test indicate that there are no statistically significant differences in customer satisfaction in terms of assessing the importance of the *Nonfunctional app* feature of digital banking services (F(2,532) = 0.944, p = 0.390). Average scores of *Nonfunctional app* service characteristics according to user satisfaction with the impact of digitalization of products and services are given in Figure A7, Appendix B.

In addition, statistically significant differences were found in customer satisfaction in terms of the risk assessment of digital banking services *Risk of fraud* (F(2,532) = 3.623, p = 0.027). Subsequent tests for multiple comparisons (Tuckey HSD) found that respondents who state that digital banking affects bank satisfaction differ statistically significantly in terms of assessing this risk (M = 3.17) compared to those who state that it affects bank satisfaction (M = 2.89). Respondents who are more satisfied with the bank estimate this risk to be lower. Figure A8 in Appendix B displays average scores of the characteristics of services' *Risk of fraud* according to user satisfaction with the impact of digitalization of products and services.

The results of the ANOVA test indicate that there are no statistically significant differences in customer satisfaction in terms of assessing the importance of the *Regulatory restrictions risk* of digital banking services (F(2,532) = 0.283, p = 0.753). Presentation of average scores of the characteristics of services' *Regulatory restrictions* according to user satisfaction with the impact of digitalization of products and services is given in Figure A9, Appendix B.

The results of the statistical analysis have confirmed the H2 hypothesis in terms of assessing the risks of digital banking services—*Safety of personal and financial data*, *Insufficient knowledge of digital banking*, and *Risk of fraud*. However, it has not been confirmed in terms of *Nonfunctional app* and *Regulatory restrictions risk*. Such results indicate that concerns regarding *Safety of personal and financial data*, *Insufficient knowledge of digital banking*, and *Risk of fraud* lead to significant differences in customer satisfaction levels, while the risks of *Nonfunctional App* and *Regulatory restrictions* do not affect satisfaction in using digital banking services. Results regarding *Safety of personal and financial data* are in line with several studies such as (Saputra et al. 2022; Alzoubi et al. 2022; Cele and Kwenda 2024) regarding operational risks (cyber-attacks, system failures, and downtime and timeout services) from digital banking services. Also, results that are in the same line for *Safety of personal and financial data* are found in numerous papers. For example, Ghelani et al. (2022) argue that management of big data has become more critical since cyberbanking is evolving and becoming increasingly digital. Our research is in line with their results, especially keeping in mind that the banking system needs the best architecture for easy access and the safest means to protect data from various threats. Cele and Kwenda (2024) pointed out that the most significant cybersecurity threats that hinder the adoption of digital banking are identity theft, malware attacks, phishing, and vishing.

Hypothesis H3: *Expectations from the digitalization of banking services lead to (significant) differences in customer satisfaction levels: has been confirmed partially.*

Table 4 presents a comparison of three groups of respondents according to the impact of digitalization of products and services on bank satisfaction (group 1—does not affect; group 2—affects; group 3—affects a lot) in terms of assessing expectations from the digitalization of banking services.

Table 4. Comparison of three groups of respondents (satisfaction with the use of digital banking services) in terms of assessing expectations from the digitalization of banking services.

		Sum of Squares	Df	Mean Square	F	*p*
More digital products and services	Between Groups	27.649	2	13.824	17.207	<0.001
	Within Groups	427.409	532	0.803		
	Total	455.058	534			
Better security of digital banking	Between Groups	0.842	2	0.421	0.454	0.635
	Within Groups	492.904	532	0.927		
	Total	493.746	534			
More simple app	Between Groups	5.282	2	2.641	2.867	0.058
	Within Groups	490.094	532	0.921		
	Total	495.376	534			
New functionalities	Between Groups	13.482	2	6.741	10.359	<0.001
	Within Groups	346.189	532	0.651		
	Total	359.671	534			

Notes: df—degrees of freedom; F—statistic; *p*—statistical significance. Source: Author's calculations.

The results of the ANOVA indicate that there are statistically significant differences between customer satisfaction in terms of assessing expectations from the digitalization of banking services' *More digital products and services* (F(2,532) = 17.207, p <0.001). Subsequent tests for multiple comparisons (Tuckey HSD) found that customers who state that digital banking does not affect bank satisfaction at all differ statistically significantly in terms of assessing expectations (M = 3.81) compared to those who state that it affects satisfaction (M = 4.22) and affects it very much (M = 4.48). Also, there is a statistically significant difference between the respondents who point out that digital banking affects and greatly affects satisfaction with the bank in terms of assessing expectations. Respondents who are more satisfied with the bank have higher expectations. Figure A10 in Appendix B displays average scores of characteristics of *More digital products and services* according to user satisfaction with the impact of digitalization of products and services.

Furthermore, the results of the ANOVA indicate that there are no statistically significant differences between customer satisfaction in terms of assessing expectations from the digitalization of banking services' *Better security of digital banking* (F(2,532) = 0.454, p = 0.635). Display of average scores of the characteristic of *Better security of digital banking* services according to customer satisfaction with the impact of digitalization of products and services is given in Figure A11, Appendix B.

Additionally, the results of the ANOVA indicate no statistically significant differences between customer satisfaction in terms of assessing expectations from the digitalization of banking services' *More simple app* (F(2,532) = 2.867, p = 0.058). Figure A12 in Appendix B presents average scores characteristics of *More simple app* services according to user satisfaction with the impact of digitalization of products and services.

Also, statistically significant differences were found between customer satisfaction in terms of assessing expectations from the digitalization of banking services' *New functionalities* (F(2,532) = 10.359, p < 0.001). Subsequent tests for multiple comparisons (Tuckey HSD) found that customers who state that digital banking does not affect bank satisfaction at all differ statistically significantly in terms of assessing expectations (M = 4.13) compared to those who state that it affects (M = 4.47) and affects very much (M = 4.62). Respondents who are more satisfied with the bank have higher expectations. Average scores of characteristics

of *New functionalities* according to user satisfaction with the impact of digitalization of products and services are given in Figure A13, Appendix B.

The results of the statistical analysis confirm hypothesis H3 in terms of estimating respondents' expectations from digital banking services for *More digital products and services* and *New functionalities*. It has not been confirmed in terms of *Better security of digital banking* and *Simpler app*. Such results indicate that the observed expectations from the digitalization of banking services; *More digital products and services*, and *New functionalities* lead to significant differences in satisfaction levels among respondents. Results regarding *New functionalities* are similar to those found in several other studies (Windasari et al. 2022; Sinha and Singh 2023; Bhatnagr et al. 2024; Ankit 2011) and the bank's readiness to respond to respondents' expectations regarding *More digital products and services* could be found in (Gazi et al. 2024; Ogundipe et al. 2024). Additionally, customer expectations regarding *Better Security of Digital Banking* and *More simple App for Digital Banking* do not affect satisfaction in using digital banking services. However, Bhatnagr et al. (2024) argue that the successful implementation of AI in digital banking largely depends on AI features. These authors point out that AI design will become a fundamental factor in the very near future. The questionnaire is composed of a wide variety of questions that do not examine a single construct. Therefore, we have calculated Cronbach's alpha coefficient for individual questions, which serves to test the internal consistency of the scale, i.e., the degree of relatedness of the items that make up the scale. These are questions that contain a larger number of items and whose results are expressed on a scale. The magnitude of this coefficient indicates whether all the values of an instrument measure the same construct. A confidence coefficient above 0.7 is considered acceptable, above 0.8 is desirable, and above 0.9 indicates high confidence. The alpha confidence coefficient is sensitive to the number of items (the reliability is higher for questionnaires/questions with a larger number of items) and the results obtained are expected. Cronbach's alpha coefficient is presented in Table 5.

Table 5. Cronbach's alpha confidence coefficient of questions in the questionnaire.

Questions	Cronbach's Alpha	Number of Items
What is crucial for choosing the bank with which you have an account?	0.598	5
You use digital banking services for the following reasons	0.786	4
What do you consider are the disadvantages or risks of using digital banking?	0.701	5
What are your expectations from the digitalization of banking services?	0.786	4

Note: Cronbach's Alpha—internal consistency coefficient.

For the given number of items (5) in the first question (*What is crucial for choosing the bank with which you have an account?*), the reliability of scores is unacceptable ($\alpha = 0.598$). The value of the other questions is satisfactory; the reliability of question (4) '*You use digital banking services for the following reasons*' is $\alpha = 0.786$; question (5) '*What do you consider to be the disadvantages or risks of using digital banking?*' has a reliability of $\alpha = 0.701$; and question (4) '*What are your expectations from the digitalization of banking services?*' has reliability coefficient of $\alpha = 0.786$.

5. Conclusions

The financial services sector has experienced significant disruption with the emergence and development of digital technologies. Bank customers have certain expectations of technology development and digitalization. With the development of new innovative

technologies, new players are entering the arena of banker's products and services. In order to stay competitive, banks must meet those expectations. To this end, the banking sector started creating new products and services and looking for new channels through which to offer those services in a way that meets customers' uplifted expectations.

The aim of this paper is to analyze user expectations of digital banking and to gauge how these expectations affect their satisfaction with digital banking services. In this paper, the authors analyze the differences in the levels of satisfaction among customers in terms of the characteristics of digital banking services, the risks of digital banking, and the expectations of digital banking. For that purpose, an empirical survey was conducted, using an online questionnaire. The participants in the study were individuals with a bank account and experience with digital banking services. Questionnaire responses were analyzed by means of both descriptive and inference statistics.

One of the questions in the questionnaire related to the factors which most influence respondents when choosing a bank. The respondents were given five options: *proximity to the branch*, *transaction and account management costs*, *favorable lending conditions*, *developed digital banking services*, and *ATM location*. *Developed digital banking services* were identified as the most important factor when choosing a bank. Out of the total number of respondents, 60% chose *digital banking services* as a crucial factor for bank selection, almost 20% more than the next important factor (*ATM location*). If we consider the respondents for whom digital banking services are important, then the percentage rises to almost 90%. These previous findings state that customers today find developed digital banking services crucial when choosing a bank for the management of their personal and business finances.

The results from the statistical analysis of the influence of digital banking characteristics on the level of satisfaction of customers for using digital banking services show that *time-saving* characteristics, *ease of use of digital banking services*, and *flexibility in terms of the use of services in relation to place and time* lead to significant differences in customer satisfaction levels. These results are completely in line with the socio-demographic data, especially bearing in mind that most of the respondents have high education levels and are between 36 and 45 years old. For users of banking services in Serbia, the cost of using digital services is a factor that, compared to other aspects, does not affect the level of satisfaction when using digital banking services. Our assumption is that costs are generally not criteria for choosing a bank and, therefore, do not affect customers' satisfaction. Additionally, a possible explanation may be that the costs of maintaining a bank account do not change depending on whether customers use digital banking services or not. Bearing in mind that our respondents are under 50 years old, we argue that there is no doubt that they are digitally literate and that the use of digital banking products and services has already become the norm for them.

The research also analyzed the risks of digital banking services. The results showed that the risks of *Safety of personal and financial data*, *Insufficient knowledge of digital banking*, and *Risk of fraud* lead to significant differences in customer satisfaction levels, while the risks of *Nonfunctional App* and *Regulatory Restrictions* do not affect satisfaction in using digital banking services. Since the participants in the study are educated people, we assume that they are aware of potential risks, and that it is important for them that the bank takes all necessary steps to minimize risks.

This study also examined the estimation of client expectations from digital banking services. Results from the study indicate that the observed expectations of *More digital products and services* and *New functionalities* from the digitalization of banking services lead to significant differences in satisfaction levels between clients. On the contrary, customer expectations regarding *Better Security of Digital Banking* and *Simpler App for Digital Banking* do not affect satisfaction in using digital banking services. Since respondents were of a

younger age, it was expected that innovative solutions (e.g., more products, new functionalities) would make a difference in their satisfaction levels regarding online banking services and products.

This paper contributes to the literature and general practice in several ways. First, we contribute to the literature on digital banking services. We also contribute to research that attempts to understand customer satisfaction with digital banking services. Moreover, we analyzed in detail the risks associated with digital banking that lead to significant differences in customer satisfaction levels. Finally, we contribute to research on customer expectations of digital banking and their influence on customer satisfaction.

This research may not only add to the literature on this highly debated subject but also help practitioners in the banking sector prepare for the changing needs of their customers and pave the way for new digital products and services, as well as new ways to offer digital products. This is especially important for fintech companies and other non-financial players entering banking services.

Our study has several limitations, and we propose several future research agendas. The first limitation of this study is its methodology. Although we started with theoretical models, the study of customer satisfaction might be more captivating by using an experimental approach in collecting real-time customer data. Second, since this study is limited to examining customer satisfaction, another possible area of future research is measuring customer loyalty and customer intentions to use digital banking services. Third, we are aware of the potential existence of multicollinearity when it comes to the characteristics of digital banking services. However, we believe that potential multicollinearity does not undermine the validity of data, but it should certainly be considered in further work on this topic. Despite the limitations, the findings can offer more insights into how digital banking services can increase customer satisfaction.

One of the future research directions could be to reveal which perceived characteristics and expectations of digital banking services create the highest levels of satisfaction of customers when using digital banking services. Further research might also reveal what types of risks of using digital banking services most commonly affect customers' satisfaction and what new risk types will emerge. Finally, the geographical scope of the research area could be broadened in the future.

Author Contributions: Conceptualization, S.B.R. and N.R.; methodology, S.B.R. and N.R.; software, S.B.R.; validation, S.B.R., N.R. and R.R.; formal analysis, S.B.R.; investigation, S.B.R., N.R. and R.R.; resources, R.R.; data curation, R.R.; writing—original draft preparation, S.B.R.; writing—review and editing, R.R.; visualization, S.B.R.; supervision, R.R.; project administration, R.R.; funding acquisition, R.R. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Data is contained within the article.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Digital Banking in Serbia from the Customer's Perspective
(Part of the original questionnaire that relates to this research)

Gender	Female Male
Age	<25 25–35 36–45 46–55 56–65 >65
Education	Secondary school College Degree Master diploma PhD
Employment	Entrepreneur Employed in the public sector Employed in an NGO Employed in a private company Founder/Owner of the Company Employed in the financial sector
What's your monthly income?	Up to RSD 40,000 From RSD 40,000–60,000 From RSD 60,001–80,000 From RSD 80,001–100,000 Over RSD 100,000
You use digital banking services for the following reasons (multiple responses are possible at the same time): (Rate on a scale from 1 (least important) to 5 (very important))	Lower transaction costs Time-saving Ease of use Flexibility in the use of services (place and time)
What do you think are the risks of using digital banking? (Score on a scale from 1 (lowest risk) to 5 (highest risk) of digital banking)	Safety of personal and financial data in the execution of transactions Insufficient knowledge of digital banking A non-functional digital banking app Increased possibility of financial fraud Regulatory restrictions on the use of digital banking
Rate your satisfaction with the use of digital banking services in your bank	1—very dissatisfied; 5—very satisfied
To what extent does the digitalization of products and services affect, in general, your satisfaction with the bank	1—does not affect at all; 5—greatly affects
What are your expectations from the digitalization of banking services: (Rate on a scale from 1 (low expectations) to 5 (very high expectations))	Increasing the number of digital products and services Greater security in making transactions Easier use of digital banking applications Development of new digital banking functionalities

Appendix B

Figures of the ANOVA results (all figures are results of the Author's research).

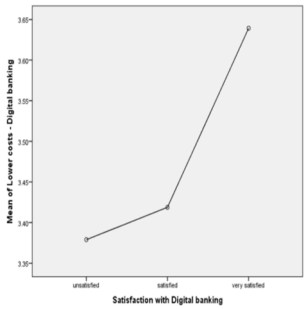

Figure A1. Average scores of the characteristic of *Lower Cost services* according to customer satisfaction with the use of digital banking services.

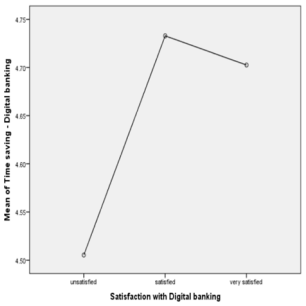

Figure A2. Average scores of the characteristic of *Time-saving services* according to customer satisfaction using digital banking services.

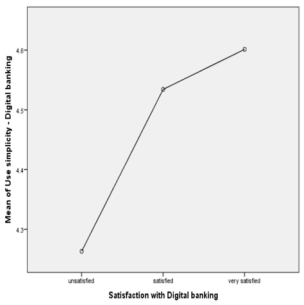

Figure A3. Average scores of the characteristic of *Use simplicity service* according to customer satisfaction with the use of digital banking services.

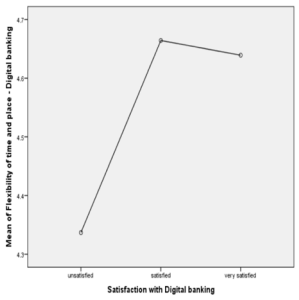

Figure A4. Average scores of the characteristic of *Flexibility of time and place* services according to customer satisfaction with the use of digital banking services.

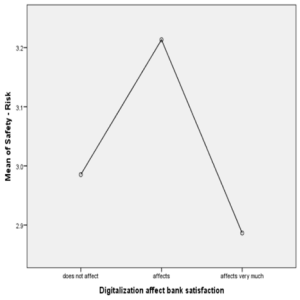

Figure A5. Average scores of the characteristic of *Safety service* according to user satisfaction with the impact of digitalization of products and services.

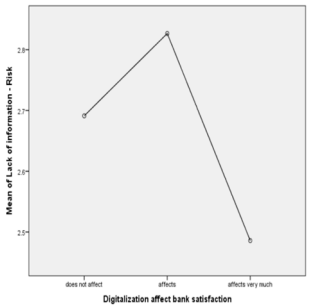

Figure A6. Display of average scores the characteristic of *services' Lack of information* according to user satisfaction with the impact of digitalization of products and services.

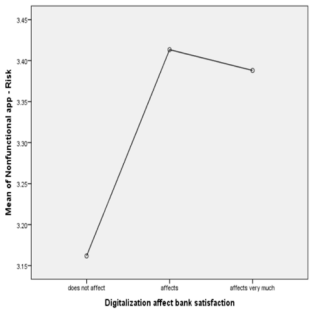

Figure A7. Average scores of the characteristic of *Nonfunctional app service* according to user satisfaction with the impact of digitalization of products and services.

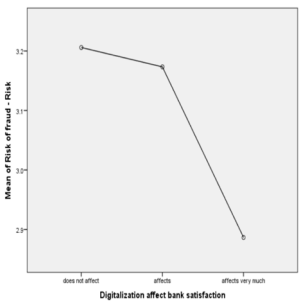

Figure A8. Average scores of the characteristic of *services' Risk of fraud* according to user satisfaction with the impact of digitalization of products and services.

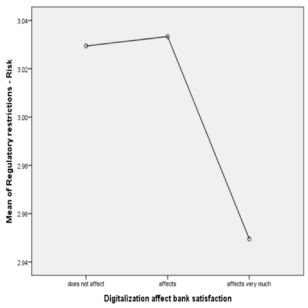

Figure A9. Average scores of the characteristic of services' *Regulatory restrictions* according to user satisfaction with the impact of digitalization of products and services.

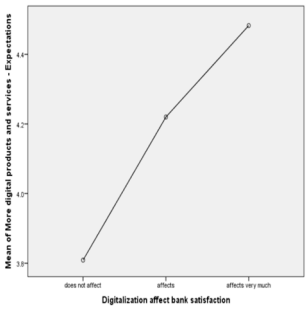

Figure A10. Average scores of the characteristic of services' *More digital products and services* according to user satisfaction with the impact of digitalization of products and services.

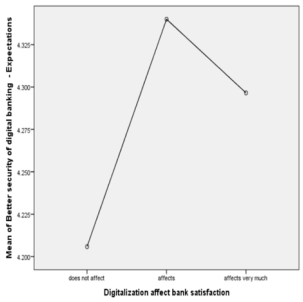

Figure A11. Average scores of the characteristic of *Better security of digital banking* services according to customer satisfaction with the impact of digitalization of products and services.

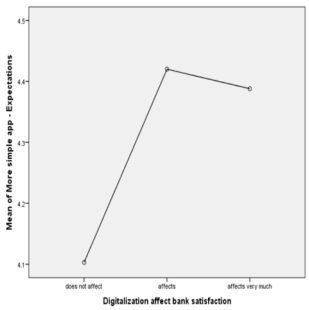

Figure A12. Average scores of the characteristic of *More simple app* services according to user satisfaction with the impact of digitalization of products and services.

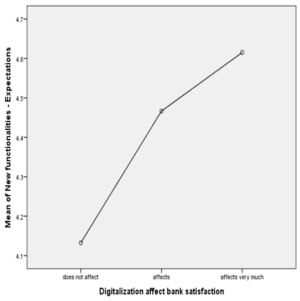

Figure A13. Average scores of the characteristic of *New functionalities* in services according to user satisfaction with the impact of digitalization of products and services.

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