https://doi.org/10.7251/EMC2603640A

UDK: 330.322(497.5):[005.334:336.71

Datum prijema rada: 6. februar 2026.
Submission Date: February 6, 2026
Datum prihvatanja rada: 25. avgust 2026.
Acceptance Date: August 25, 2026

Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review

Godina/Vol. **XVI** • Br./No. **III**
str./pp. 640-655

ORIGINALNI NAUČNI RAD / ORIGINAL SCIENTIFIC PAPER

FINANCIAL INNOVATIONS IN THE CROATIAN BANKING SECTOR: THE PERCEPTION OF BANK MANAGERS[1]

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Abstract: In the dynamic environment of the modern financial sector, innovations play an increasingly important role in shaping the business strategies and services of financial institutions. This particularly applies to the banking sector, which is continuously and significantly adapting to technological changes and market demands, thus creating the potential for strengthening financial inclusion. Due to the increasing importance of this topic, the paper clarifies the concept of financial innovations and presents the results of qualitative research based on data obtained through structured interviews with high-level managers of the six largest banks in the Croatian banking sector. The collected data enabled a comparison and analysis of the perception of financial innovations in different banks, which provides a clearer insight into the diversity of bank managers' attitudes in this area, and consequently contributes to understanding the impact of their perception on the formation of business models. The above also contributes to increasing the reliability and credibility of the results obtained. The aim of the research is to determine, based on the analysis conducted, the dynamics and manner in which financial innovations are implemented in banking operations and what their impact is on existing bank business strategies. The results of the research conducted indicate a deep integration of financial innovations into banks' business models and their significant impact on business strategy, internal processes and financial services distribution channels in the Croatian banking sector, which consequently affects the strengthening of the availability of financial services to end users. Financial innovations have also significantly shaped consumer expectations regarding the availability, speed and personalization of financial services. The main conclusion of the paper is that financial innovations are necessary and

1 *This research is part of the FININC project funded by the European Union – NextGenerationEU within the framework of the Call IIP-581-2025.*
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desirable, but their successful implementation requires stronger regulatory support and special attention within the risk management system.

Keywords: financial innovation, digitization, risks, Fintech, financial inclusion

JEL classification: G20, G21, O31, O33

INTRODUCTION

The financial market is characterized by dynamic change and the need for continuous adaptation. Technological progress (digitalization) is associated with the emergence of numerous disruptive innovations which, among other effects, have significantly transformed banking operations and caused changes in the behavior of end users of financial services. In response to these developments, banks worldwide, including those operating in the Croatian banking market, are actively adjusting their business models in order to provide financial services that meet contemporary market demands, thereby also influencing trends in financial inclusion. This includes the development and implementation of financial innovations, which are increasingly becoming a key tool for maintaining competitiveness and relevance in the financial sector, as well as for enhancing the accessibility of financial services. Financial innovations do not represent a temporary response to technological changes, but rather a permanent and growing trend that has recorded strong growth in recent years in both global and national financial markets, and consequently must be taken into account when shaping business strategies.

In the context of the Croatian banking market, the largest banks are introducing innovative digital solutions to respond to market challenges and opportunities, strengthen competitiveness, and attract new customers. However, although the application of financial technologies and other related innovations in banking operations is associated with higher levels of operational efficiency, improved customer experience, and greater customer satisfaction, their effective implementation also requires particular attention to the adequate identification and management of digitalization-related risks, including risks related to financial technology, within governance frameworks, as well as appropriate regulatory coverage. Through the development and implementation of financial innovations, banks are able to respond in a timely and precise manner to the increasingly complex and changing needs of their customers, ultimately maintaining competitiveness in the market. Nevertheless, it should be emphasized that each bank possesses different resources and pursues different strategic objectives, which ultimately influences the specific approaches adopted in the development and introduction of financial innovations into business models and strategies.

This paper therefore focuses on exploring key challenges and opportunities, as well as the specific circumstances that accompany the process of developing and implementing financial innovations within traditional business models. Special emphasis is placed on analyzing the impact of financial services consumers' behavior on the development and implementation of financial innovations, which in a digital environment plays a crucial role in shaping banking products and services with the aim of maintaining or increasing competitiveness. Digitalization, and particularly the digital transformation of banking operations, also leads to rising expectations among financial services users, forcing banks to continuously improve their digital solutions in this context in order to retain existing and/or attract new clients, as well as potentially include those who are insufficiently served by traditional financial services. To fully understand the challenges and specific features of the development and implementation of financial innovations in banking, it is also necessary to consider the broader context in which they emerge and evolve. Accordingly, by analyzing the processes of development and introduction of financial innovations in the banking sector based on data collected through structured interviews with senior managers of large banks operating in Croatia, this paper contributes to a deeper understanding of their functionality and effectiveness, as well as the benefits and limitations and the risks arising from them, while taking into account the perspectives of all relevant stakeholders (banks, clients, and regulators).

The paper is structured into five sections. Following the introductory section, the second section reviews previous research on the effects of financial innovations in banking operations and discusses the theoretical aspects of financial innovations. The third section explains the data sources and methodology used in the research. An overview of the research results, along with critical analysis and discussion, is presented in the fourth section. The fifth section provides concluding remarks.

INNOVATIONS AND FINANCIAL INNOVATIONS: THEORETICAL OVERVIEW AND LITERATURE REVIEW

Innovation is a broad and complex concept encompassing various approaches and interpretations; however, there is no single definition that precisely delineates the innovation process. The term “innovation” originates from the Latin word innovatus, referring to something new, a novelty, or a change in the existing state (Tolić, Sabljić, & Sabljić, 2022). In literature, innovation is defined in various ways, but it is most understood as a new or significantly improved product, marketing practice, or organizational process. Innovations encompass a wide range of activities, spanning scientific and technological as well as financial and market-related activities, which result in the creation of new or technologically enhanced products and services (Galović, 2016). The purpose of innovation is reflected in the application of new solutions and investments in new research, particularly in the field of financial innovations, with the aim of improving the overall efficiency and organization of business systems. Accordingly, innovations are essential for business modernization and the preservation of competitive advantage in the market.

According to (Đokić, Rašić, & Slijepčević, 2022), an innovation represents a new or improved product, process, or a combination thereof that differs significantly from previous solutions and is either available to potential users or already in use. Moreover, innovations may relate to technological advancement, the introduction of new products and services, as well as changes in management practices and business processes. Knowledge and investment in innovative processes constitute fundamental determinants of competitive advantage. Therefore, firms seeking to maintain market relevance must continuously develop innovations and invest in knowledge. The development of innovations largely depends on effective knowledge exchange, with such dynamics directly influencing the design of products, services, organizational structures, and business models. Furthermore, to ensure that employees are willing and able to experiment, it is necessary to build an environment that fosters innovative behavior (Rončević & Ostojić, 2022).

Within the innovation process, the distinction between innovation and invention is often emphasized. According to (Tidd & Bessant, 2020), invention represents the initial stage involving the development of an idea, whereas innovation is achieved only when that idea is transformed into a practically applicable solution. Additionally, within innovation policy, a prevailing view has long been that innovations develop as the result of a linear process in which they are seen as a direct outcome of investments in research and development (Mršić & Petković, 2020). However, contemporary approaches increasingly emphasize the importance of interactions among various stakeholders, as well as the role of knowledge and technology. In this context, knowledge and technology transfer activities are recognized as key drivers of innovation creation (Muizniece & Cepilovs, 2017). Emphasis is also placed on business model innovation, which is considered one of the most important sources of competitive advantage for organizations aspiring to survive and grow in the contemporary market environment. Consequently, business success is based on an understanding of all elements of the business model, while innovations can be achieved through improvements in content, interconnections, and the management of business activities, for example by introducing new activities (Milovanović, Srhoj, & Krišto, 2017).

Innovations in the financial sector based on modern technologies are increasingly influencing banking operations, whereas academic debate on the impact of Fintech has gained momentum only in more recent years. These changes are closely linked to new patterns of behavior and evolving needs of financial services users. According to the Croatian National Bank (CNB, Bezgotovinske platne transakcije 2024, 2023), an increase in both the number and total value of cashless transactions has been observed, largely driven by more frequent use of payment cards, growth in online payments, and the use of digital wallets. Nevertheless, traditional payment methods, such as credit transfers and direct debits, continue to hold a dominant position in total payment traffic. (Bračun & Turkalj, 2020). emphasize that Croatian banks recognize both the opportunities and threats arising from digital transformation, noting that clients increasingly use digital financial services because of continuous improvements in Fintech products. Accordingly, banks have shifted a significant portion of their operations toward mobile applications tailored to both individual and corporate customers (Klobučić, 2019), which have long been recognized as an effective tool for strengthening financial inclusion (Claessens & Rojas-Suarez, 2016).

The adoption of sustainable business practices and corporate social responsibility as imperatives of modern business further encourages operations that take social factors into account, including the achievement of social objectives (Sopta Čorić & Čulo, 2025), among which financial inclusion plays an important role. In this context, procedures and decision-making processes related to investments in innovation have been shown to be a significant factor in corporate growth (Sopta, Upravljanje digitalnom transformacijom državnog poduzeća, 2020). (Ulrich-Deiner, Dvoulety, & Špaček, 2023) point out that although the digitalization of banking operations brings greater speed, lower costs, and improved service accessibility, its effects cannot be compared to the deeper and more disruptive changes introduced by the Fintech sector. According to (Parminder, Shivinder, Sood, Grima, & Rupeika-Apoga, 2022), the most pronounced impact of the Fintech sector is observed in retail banking, where an increasing number of users rely on services provided by digital banks such as Revolut.

Consequently, banks are increasingly adopting technologies that enable greater automation, efficiency, and reductions in operating costs. Furthermore, banks are among the largest investors in Fintech solutions, as they perceive them as an opportunity to develop business models that are competitive and aligned with actual market needs (CBA, 2019).

The digitalization of business operations also includes the transfer of customer data to digital storage solutions such as cloud environments, raising concerns related to data security and regulatory requirements in digitalization risk management (information and communication technology risks, Fintech risks, security risks, and others). (Haddad & Hornuf, 2023) therefore warn of legal uncertainty arising from the fact that Fintech companies often operate outside the strictly regulated frameworks applicable to traditional banks. In addition, (Tomić, 2019) highlights security as one of the key challenges associated with financial innovations, with particular emphasis on personal data protection and cybersecurity. Moreover, the Croatian National Bank (CNB, 2019) stresses that while Fintech solutions bring numerous benefits to the financial system, they also pose risks such as fraud, data misuse, and potential threats to the stability of the financial and monetary system. Despite these challenges, in order to maintain competitiveness and ensure business continuity, banks are compelled to adapt their business models and strategies to new market requirements and user needs in terms of developing and implementing financial innovations. However, for these innovations to be effective, it is essential to adequately integrate the risks arising from financial innovations, digitalization, and digital transformation into governance systems, as well as to ensure an appropriate regulatory framework.

DATA AND RESEARCH METHODOLOGY

This section of the paper presents an analysis of bank managers' perceptions of the role, importance, and effects of financial innovations in contemporary banking operations. For conducting this empirical research, the structured interview method was applied in order to obtain insights into the attitudes of senior managers employed in large banks within the Croatian banking sector (large banks defined as banks with a share of assets exceeding 5% of the total assets of the banking sector). At the time of the interviews, the respondents were actively involved in the process of introducing financial innovations within the banks in which they were employed. Accordingly, the research participants consisted of managers from six large banks whose combined assets account for approximately 90% of the total assets of the Croatian banking sector (EUR 76.5 billion out of a total of EUR 84 billion; (CNB, Statistics – Table SV1-h: Data on the Operations of Credit Institutions, as of 31 December 2024, 2025), of which five banks are privately owned and predominantly foreign-owned, while one bank is in domestic state ownership (CNB, 2024 and Table 1).

Table 1. Share of Large Banks in the Total Assets of the Croatian Banking Sector as of 31 December 2024 and Basic Information on the Respondents

	Share of Assets in the Total Assets of the Banking Sector, %	Respondents
B1	25,2	A.N. – senior manager
B2	20,2	Ž.LJ. – senior manager
B3	18,0	I.S. – senior manager
B4	10,2	R.M. – senior manager
B5	9,4	M.V. – senior manager
B6	8,1	V.V. – senior manager
TOTAL B1-B6	91.1%	-

Note: B (1–6) – large banks
Source: authors' based on (CNB, Statistics – Table SV1-h: Data on the Operations of Credit Institutions, as of 31 December 2024, 2025); data collected through interviews

The interviews were conducted using digital communication platforms, Skype and Microsoft Teams, as well as via telephone calls. The interview period lasted from 1 August to 1 December 2024. Personal data obtained during the interviews, including the respondents' names and surnames, length of service within the bank, and specific job descriptions, were protected. The respondents answered previously prepared questions designed to elicit as concrete and precise responses as possible, focusing on the analysis of the impact of financial innovations on banking operations, as well as the potential risks and consequences that such innovations have brought to the market. The collected responses were presented comparatively using comparative analysis in order to facilitate clearer insights and to identify similarities and differences in the respondents' views, with the aim of drawing well-founded conclusions on the subject under study.

The first question required respondents to express their views on current financial innovations present in the banking market, highlighting the prevalence of various financial innovations, their functionalities, and their level of acceptance among users. The second question focused on identifying financial innovations that respondents consider essential for contemporary banking operations. Furthermore, the third question aimed to determine the extent to which financial innovations have transformed banking operations. The fourth question examined the challenges associated with implementing financial innovations within banks' business models, while the fifth question sought to assess the extent to which banks operating in the Republic of Croatia follow global trends in the field of financial innovations. The final, sixth question aimed to identify which financial innovations have been implemented in banks and to determine their effects on banking operations.

RESEARCH RESULTS AND DISCUSSION

The respondents' answers are summarized and comparatively presented in Table 2 and are further elaborated upon in the following sections. The results of the interviews conducted with managers of six leading banks operating in the Croatian banking market reveal a consensus regarding the key role that financial innovations play in contemporary banking operations. The respondents agree that digital applications and platforms significantly facilitate access to payment services, contribute to business digitalization, and that Croatian banks follow global Fintech trends, with some respondents emphasizing the importance of transaction security and compliance with regulatory requirements.

Based on the research conducted, it can be concluded that the respondents demonstrated a high level of awareness of current developments in the field of financial innovations in the banking sector, with their perceptions being closely linked to their personal experiences and the business practices of the banks in which they are employed.

Table 2. Comparative Overview of Respondents' Answers to the Six Key Questions of the Conducted Interview

	AB1	AB2	AB3	AB4	AB5	AB6
Q1 Which current financial innovations are present in the banking market?	Neobanks with advanced information systems and mobile banking applications (with emphasis on the development of information systems as support for decentralization of cryptocurrencies, e.g. Revolut and Wise), as well as payment transaction applications such as KEKS Pay.	Innovations aimed at risk transfer, credit risk profiling, and flexibility of financial products.	Innovations focused on the development of digital technologies to improve the user experience of payment services and similar applications (KEKS Pay, George, Revolut, and Wise), enabling the personalization of financial services.	Mobile banking applications, other fintech applications/ information systems such as neobanks, with emphasis on investment stimulation (e.g. Revolut, which enables core banking services and direct access to global capital markets and cryptocurrencies).	Mobile banking applications; smart home management or control (digital currencies); adapted credit approval conditions.	Mobile banking applications; emphasis on the universalization/ usability effects of numerous features that offer business users faster alternatives for payment transactions (highlighting the growing popularity of KEKS Pay and Aircash).
Q2 In your opinion, which financial innovation has become indispensable in contemporary banking operations?	Mobile banking.	Financial technology innovations (mobile banking, digital currencies).	Mobile banking.	SEPA systems for cashless payments and P2P digital lending platforms.	Mobile banking for retail customers and internet banking for corporate clients; smart contracts based on blockchain technology.	Advanced software solutions in transaction processing with the aim of data protection and security in transaction execution (e.g. blockchain technology).
Q3 To what extent have financial innovations transformed banking operations?	Financial innovations have enhanced the quality of banking services and facilitated entry for neobanks and ICT firms, resulting in risk management challenges related to digitalization, while also encouraging continuous innovation development.	Financial innovations and digitalization are closely interconnected and have contributed to the transformation of traditional banking into modern banking.	Significant transformation of contemporary banking operations, accompanied by the development of financial innovations particularly emphasized after 2007./2008. crisis, and later further accelerated by the rise of cryptocurrencies and innovation in general.	Financial innovations have changed business models of banks and traditional service delivery methods (banks no longer provide services exclusively through branches, but increasingly through digital financial services).	Traditional methods of transaction execution and service provision are being replaced by more advanced service offerings that exclude traditional bank branches.	Modern banking is shaped by the development of financial innovations, which have led to improvements in efficiency and competitiveness, as well as changes in user behavior regarding financial services.

Q4 Can you describe the challenges of implementing financial innovations in banking operations?	A complex and demanding implementation process.	Continuous monitoring and involvement of management in professional education on the latest Fintech industry trends and their potential positive and negative effects.	Key challenges are encountered at the early stages of digitalization of banking operations; a contemporary challenge is banks' ability to effectively integrate Fintech solutions into business models.	A complex and structured implementation process—the implementation of processes that are "already underway".	A systematic and long-term implementation process that significantly depends on the level of economic development.	Destabilized financial markets in recent years; difficulties in assessing the effectiveness of innovations; complex implementation processes (large investments in infrastructure and employee education).
Q5 Do you believe that banks operating in the Republic of Croatia follow global trends in financial innovations?	Yes, through improving application functionalities in mobile banking, adapting operations to competition, and anticipating the growing popularity of KEKS Pay and Aircash in payment services.	Yes, even though no Fintech solution is considered decisive for banks' dominance in providing the same services (banks are less the sole alternative providers of financial services).	Yes, although scope for further development exists with the aim of maintaining competitiveness, primarily in relation to the presence of Fintech solutions (e.g. international payment solutions such as KEKS Pay).	Yes, but often constrained by financial resources required to conduct comprehensive studies and simulations that would support the assessment of the potential impact of innovations.	Yes, but Fintech companies offer improved solutions at lower prices and with better anonymity in transactions.	Yes, because there is a dedicated department responsible for research, development, and testing of Fintech products and the development of financial innovation projects.
Q6 Which financial innovations were introduced in the bank where you are employed, and how have they influenced banking operations?	Enhancement of mobile application functionalities (e.g. constant communication with a personal banker, use of copper, commodities, and capital market instruments, etc.) and mobile applications for business users (access to tokens, locations, business contacts, exchange rate lists). The innovations are continuous and include risk management related to digitalization and digital literacy.	Improvement of mobile banking application functionalities (contactless payments via Google Pay and Apple Pay applications), expansion of cashless payment options (withCASH savings with withSAVE, money transfers with withPAY, use of digital signatures with withSIGN). Innovations have led to risk mitigation related to digitalization, as well as to the loss of technological personnel (Fintech competition).	Development of mobile banking and modern investment solutions (applications such as George and KEKS Pay), integration of Fintech and RPA solutions. Fintech applications are intended for small entrepreneurs, crafts, and other business entities, resulting in a significant increase in the number of business users.	Improvement of mobile banking application functionalities and OTP e-trader solutions; brokerage services, 3D Secure. Active investment in continuous development in line with market trends, with an emphasis on the importance of quality risk integration into digital risk management systems.	Improvement of existing digital services and mobile banking applications (e.g. opening accounts via mobile applications), introduction of the SuperSmart PBP account, contactless payment enhancements via eCommerce options, online sub-accounts for savings and credit cards, which attracts new clients and increases customer satisfaction.	Improvement of mobile banking application functionalities, enabling contactless payments (e.g. RaiPay) and mobile payments via Apple devices, development of digital wallets, introduction of eBroker services. Digitalization and automation have led to a reduction in the number of jobs.

Note: AB (1–6) – answers of respondents from the sample of large banks; Q (1–6) – questions posed during the interviews
Source: authors

In responses to the first question, *"Which current financial innovations are present in the banking market?"*, although the answers were multifaceted, a clear dominance of financial innovations related to payment transactions can be observed, particularly those based on digital technologies (applications/advanced information systems/ software solutions for mobile payments). The basic payment services enabled by these innovations primarily include the execution of payment transactions (including bill payments, parking services, etc.), cash withdrawals at ATMs, contactless payments, and similar services. At the same time, neobanks offering these services in combination with other advanced applications were identified as key financial innovations due to their ability to facilitate transactions at low cost (AB1). Half of the respondents particularly emphasized the growing popularity of applications such as KEKS Pay for payment transactions (AB1, AB3, and AB6; additionally, Aircash – AB6), primarily due to their cost advantages (e.g. enabling bill payments without additional fees, as well as transaction execution, ATM cash withdrawals, contactless payments, and parking fee payments). The application has achieved wide acceptance among users, partly due to the early openness of its parent bank to cooperation with Fintech companies (since 2016), with the aim of leading the introduction of innovations in banking operations in the Croatian market. It is therefore considered the Croatian counterpart to global Fintech products such as Revolut and Wise (AB3). In addition to basic payment services and easier access to them, these applications also offer access to capital markets and cryptocurrency markets (AB1, AB3, and AB4), with particular emphasis placed on the role of financial asset decentralization enabled through cryptocurrencies and advanced information systems. Nevertheless, the popularity of neobanks providing such services—largely driven by affordable pricing—could be adversely affected by stricter regulation, potentially resulting in higher fees and threatening the sustainability of their business models (AB1). On the other hand, in addition to offering the aforementioned payment and/or investment access services, mobile and/or internet banking applications increasingly incorporate innovative “smart contract” services (AB5; enabling loan approvals via mobile and internet banking applications and utilizing blockchain technology), as well as innovations related to the transfer of credit risk in line with the financial capacity of intermediaries, increased profitability and flexibility of financial products, and the stimulation of long-term investments (AB2). Furthermore, platforms enabling “cloud-based operations” (e.g. digital wallet services) are highlighted as increasingly important financial innovations (AB5), following trends in the development of digital currency markets. In conclusion, cooperation with Fintech companies plays a crucial role in adapting banks’ business models (including neobanks) to consumer demands and in the development of financial innovations. Banks operating in the Republic of Croatia largely follow global trends in financial innovations, as evidenced by the availability and widespread user acceptance of the aforementioned payment applications. In 2024, the number of consumers using mobile banking increased by 10.9%, while the number of internet banking users rose by 11.6% compared to the previous year (CNB, Statistics – Table SV1-h: Data on the Operations of Credit Institutions, as of 31 December 2024, 2025).

In responses to the second question, *“In your opinion, which financial innovation has become indispensable in contemporary banking operations?”*, certain content-related differences can be observed, reflecting variations in respondents’ perceptions when identifying and weighting risks on the one hand, and the profitability and efficiency of innovations on the other. More than half of the respondents identified and emphasized mobile banking as a key driver of modernization in banking operations, given its leading role in the provision of banking services today. As a result, the scope of activities previously performed by counter staff, as well as the need for physical branches, has been significantly reduced (AB1, AB2, AB3, and additionally internet banking – AB5). More broadly, financial technology innovations in payment services (mobile banking, digital wallets, etc.) were highlighted as enabling banks to serve a larger number of customers without physical contact (AB2), thereby increasing operational efficiency. In this context, one of the most important innovations contributing to the modernization of banking operations in the Republic of Croatia is the SEPA system (Single Euro Payments Area), launched in 2013 as a matter of national interest. The SEPA system enables cashless euro-denominated transactions for individuals, businesses, and public authorities across 36 countries, using unified models and procedures, standardized payment instruments—SEPA credit transfers and SEPA direct debits—a common legal framework, and shared IT infrastructure for processing payment orders (AB4). The benefits provided by SEPA are particularly significant for corporate clients managing a large number of payment transactions. In addition, P2P (peer-to-peer) digital lending platforms were identified as another important innovation that has disrupted traditional banking business models. As a result, banks have inevitably turned to service optimization, increased engagement of IT specialists, and a stronger focus on service personalization for customers (AB4). Furthermore, the importance of innovations in the form of software solutions that follow market trends and address security risks in payment transactions and investments (e.g. data protection and transaction security) was emphasized, particularly given the ongoing trend toward a cashless society and the digitalization of money (electronic payments and the development of digital currencies). Several respondents noted that cash (banknotes and coins) is expected to gradually disappear from use over the coming decades (AB6). These trends have also been recognized as positive drivers of enhanced financial inclusion for users of financial products and services. In this context, blockchain technology was highlighted as the most important innovation, both as a foundation for the secure development of (centralized) digital currencies (AB6) and as an enabler of smart contract services (AB5). In conclusion, respondents emphasized the importance of timely adaptation of banks' operations to technological changes. Such adaptation not only supports the maintenance of competitiveness, improved management, and increased operational efficiency in terms of profitability, but also enables more effective management of ICT (information and communication technology) and security risks. Ultimately, this contributes to mitigating risks that could otherwise threaten the stability of the financial system (AB3).

In responses to the third question, *"To what extent have financial innovations transformed banking operations?"*, there is broad consensus among most respondents that digitalization and financial technology innovations have been the driving forces behind the transformation from traditional to modern banking over the past three decades, with a more pronounced impact following the 2007/2008 financial crisis. Technological progress in finance has not only transformed traditional banking into contemporary banking, but has also altered the behavior (habits, demands, and expectations) of financial services users. Through digital (and financial) literacy, users increasingly exert pressure for continuous change, improvements, and innovation, thereby further shaping adjustments in banking operations. A frequently highlighted example is the displacement of cheques from use, once a widely applied payment instrument (AB6). Periods of crisis often act as catalysts for innovation due to pressures to reduce operating costs. Accordingly, the momentum of the modern transformation of banking operations and the development of financial innovations—primarily aimed at reducing operating costs and decentralizing transactions—was further intensified after the 2007/2008 crisis and the emergence of cryptocurrencies (AB3). Financial innovations have exerted the strongest influence on changes in banks' business models, shifting from traditional models based on the provision and distribution of basic financial products and services (e.g. deposits, withdrawals, and fund transfers) in physical bank branches requiring direct contact between customers and bank employees, toward modern models. In this context, a clear trend of moving away from counter-based banking is observed (AB5). Through software-based solutions (applications) and digital communication channels, these modern models enable the growing trend of digital payment transaction execution, the digital provision of an expanding range of financial services, and changes in user behavior. Examples include the replacement of traditional savings instruments such as fixed-term deposits with alternative forms of savings or investments that are now accessible through banking applications (AB4), as well as the emergence of cryptocurrencies and their growing role in payments and investments (AB3). In this manner, financial innovations have significantly enhanced the scope and quality of banking products and services and improved their alignment with user needs. Consequently, respondents emphasized the necessity of continuous investment in the development of financial services in line with contemporary trends and the integration of innovations into existing banking business models (AB1). Furthermore, digitalization enables more efficient monitoring of customer satisfaction (e.g. surveys conducted within mobile applications; AB4). At the same time, however, it exposes neobanks (and their software) to risks inherent in digitalization, such as cyberattacks and data theft (ICT and security risks). Therefore, investment in the protection of information systems is essential to ensuring a high level of operational security and data protection, which in turn justifies the pricing of digital financial services (AB1). Fintech companies are not perceived as a threat to banks, but rather as an opportunity for cooperation. Banks possess sufficient capacity to invest in new technologies and often find it more cost-effective to acquire already tested Fintech solutions than to develop their own, thereby increasing operational efficiency through lower costs, faster and simpler payment processes, and improved customer experience (AB2). It is also expected that increased regulation and restrictions on Fintech companies' independent operations will lead to the sale of technological solutions to banks, as Fintech firms may lack the capacity for autonomous long-term operation (AB1). In conclusion, respondents agree that banking operations (traditional banking) have undergone substantial changes since the 1990s (e.g. continued globalization, re-regulation/deregulation, liberalization of operations, internationalization, etc.). Within the context of this study, modern banking—characterized by the departure from counter-based banking, digitalization of business processes, and digital provision of financial services—has undoubtedly been strongly shaped by the emergence of the internet and the development of financial technology innovations. These developments have enabled both digitalization and the subsequent digital transformation of banking operations, significantly influencing efficiency, competitiveness, and the quality of banking services. In this regard, Fintech companies do not threaten banks' operations or their survival but instead offer opportunities for cooperation and further development of banking activities, while Fintech solutions have unequivocally increased the efficiency of banking operations.

Responses to the fourth question, *"Can you describe the challenges of implementing financial innovations in banking operations?"*, also indicate a consensus that the implementation of financial innovations represents a complex and highly structured process, which is often financially demanding and time-consuming. The degree and pace of introducing financial innovations within banks are closely linked to the level of economic development of the country in which banks operate. In this regard, the Republic of Croatia is currently at a turning point. The turbulence in financial markets caused by the current geopolitical situation, combined with rising inflation and the consequent restrictive monetary policy in recent years, has slowed the previously dynamic development and implementation of innovations aimed at addressing specific user demands and needs. These needs are already largely met—or can be adjusted to individual users—through financial technologies that enable rapid and efficient processing of large volumes of data and the application of artificial intelligence. As a result, the primary focus of banking operations has shifted toward preserving financial stability amid tighter lending conditions and rising interest rates (AB6). In this context, the emergence of digital platforms offering credit services (P2P lending) over the past several years, as one of the more significant recent Fintech innovations, does not currently pose a serious threat to bank lending activity. However, it has highlighted the importance of continuously monitoring market trends and investing in the development and implementation of financial innovations (AB6), with continuity in this process being clear (AB4). The momentum of financial innovation development and the transformation from traditional banking models—particularly pronounced over the past fifteen years—required substantial initial infrastructure investments and extensive employee education in the context of digitalization. During this period, the key barriers to implementing financial innovations were largely overcome (AB3). Today, however, the main challenge lies in assessing innovation potential and making informed decisions regarding which innovations are cost-effective to implement within banking business models, with efficiency being measured as the ratio between investment costs and the resulting benefits and profitability (AB6), as well as the ability to integrate innovations into existing business models (AB3). The process of developing and implementing financial innovations is therefore assessed as highly complex and structured (AB1, AB4, and AB6), systematic, and often long-term—lasting months or even years—and frequently dependent on the level of economic development (AB3). This process includes conducting market research, whereby specialized teams initially perform in-depth analyses of Fintech market developments, followed by the preparation of studies or implementation strategies that define the necessary steps. Subsequently, strategic decisions regarding financial investments are made, IT experts are engaged (most often through outsourcing), and substantial time and resources are allocated to employee training related to new technologies and innovative products, most commonly through seminars or team-building activities (AB1 and AB4). In this process, particular emphasis is placed on the importance of continuous monitoring and active participation of management in professional training programs focused on the latest Fintech industry trends and their potential impacts—both positive and negative, especially regarding risks and their implications for financial system stability (AB2). Following this, decisions are made concerning the way the innovation will be distributed, while the final stage includes data collection and analysis of the innovation's effects on both bank performance and customer satisfaction (AB1). In conclusion, the implementation of financial technology innovations is a highly complex process, and decision-making in this area—based on a high-quality assessment of innovation potential, expected efficiency, and continuous monitoring of trends in the financial innovation market — remains one of the greatest challenges for banks. The financial intensity of implementation is often a limiting factor, which can be particularly challenging for banks facing budgetary constraints.

Responses to the fifth question, *"Do you believe that banks operating in the Republic of Croatia follow global trends in financial innovations?"*, likewise indicate a consensus among respondents that banks in the Republic of Croatia largely keep pace with global trends in the development and implementation of financial innovations. This is evidenced, for example, by the establishment of dedicated departments responsible for researching and monitoring current Fintech products, as well as for project development and the implementation of financial innovation processes (AB6). However, limited financial resources often prevent the execution of more comprehensive studies and simulations assessing the potential effects of financial innovations, such as those conducted by leading global banks. An illustrative example is the U.S. investment bank J.P. Morgan, which has introduced AI assistants for its employees, reflecting a strong orientation toward digital transformation and innovation in banking operations (AB4). The continuous development and upgrading of mobile banking applications — which, in addition to payment services, enable customers to conclude contracts such as consumer loans (including the use and monitoring of overdraft facilities) and offer various savings and investment products (fixed-term deposits, investments in mutual funds, etc.; AB1) — represent banks' response to the introduction and widespread adoption of Fintech solutions such as KEKS Pay and Aircash. These applications play an increasingly important role in payment transactions and continue to expand through new functionalities. For example, KEKS Pay enables bill payments with partner entities without fees, offers savings options, and includes loyalty programs for users who conduct transactions via the application (AB3). This demonstrates the successful adaptation of banks' business models to technologically advanced financial products and confirms the maintenance of competitiveness and business sustainability in line with market conditions and evolving customer requirements (AB1). Furthermore, it was emphasized that to date, no Fintech solution has significantly undermined banks' leading position or popularity in providing comparable financial services, not even during the COVID-19 pandemic, which triggered increased interest in the cryptocurrency market and contributed to its rapid growth. Users continue to place greater trust in banks than in alternative financial service providers (AB2). Nevertheless, Fintech companies have been particularly successful because they offer more favorable services than banks — at least until stricter regulation, which will likely result in higher prices, as already emphasized in responses to the first question (AB1). In addition, Fintech solutions enable a higher degree of transaction anonymity, which is appealing to many users, especially those who prefer decentralized transactions (AB5). In conclusion, monitoring trends related to financial innovations is essential, and their implementation is inevitable for maintaining competitiveness, ensuring business sustainability, and supporting the continued transformation of banking operations, while simultaneously strengthening financial inclusion.

Ultimately, the responses to the sixth question, "*Which financial innovations has the bank in which you are employed introduced, and how have they affected the* *bank's operations?"*, also reveal similar perspectives, given that the respondents represent large banks that compete intensely with one another, making their shared interest in financial innovations unsurprising. In addition to the traditional range of financial services, mobile banking applications stand out in terms of enhanced functionalities, particularly the introduction of contactless payments (e.g. RaiPay), the development of digital wallets, and the implementation of eBroker services, which additionally enable users to monitor real-time stock price movements on the Zagreb Stock Exchange (AB6). According to AB4, particular emphasis is placed on the improvement of functionalities within the OTP mobile banking application ("OTP-ica"), with the OTP-go! campaign launched to promote mobile banking usage. The application also includes a loyalty program, whereby users collect points through app usage that can later be redeemed for retail discounts. Furthermore, the OTP e-trader application enables users to trade various types of financial instruments across nearly all major financial markets. To enhance transaction security, especially in the context of online purchases, the 3-D Secure service has been introduced as an additional layer of customer protection. In AB1, improvements in the functionality of the m-zaba mobile application are highlighted as a means of increasing customer satisfaction, including options such as virtual meetings with a personal banker, taking queue numbers in advance for branch visits, and access to capital market trading. Additionally, enhanced functionalities of a new mobile application tailored to business users are emphasized, providing access to m-token authentication, branch locations, contacts, exchange rate lists, and personalized settings aligned with user priorities. Furthermore, AB2 underscores improvements to mobile banking applications through the introduction of contactless payments via Google Pay and Apple Pay, cardless cash withdrawals using the #withCASH option, automated savings that round purchase amounts up to the nearest unit or multiple of ten through #withSAVE, money transfers to contacts directly from users' contact lists via #withPAY, and the use of digital signatures (#withSIGN), allowing clients to conduct banking services without visiting a physical branch. Similarly, AB3 emphasizes a strong orientation toward anticipating innovations as well as evolving customer demands and needs, particularly in the development of mobile banking and modern digital solutions (George and KEKS Pay applications). For business users, cooperation with FINA led to the development of a Fintech application intended for small entrepreneurs, tradespeople, and other business entities. This solution attracted many new business clients by enabling invoices and offer creation, expense and incoming invoice tracking, integration with bank accounts (automatic display of balances and transactions directly within the application interface), and integration with web shops — allowing automatic generation of invoices and offers based on completed orders and transactions. As a result, business administration is optimized, time savings are achieved, and everyday operations are simplified.

CONCLUSION

The analysis of perceptions held by senior managers employed in the largest banks within the Croatian banking sector enables the formulation of several conclusions that contribute to a deeper understanding of the role and effects of financial innovations in contemporary banking operations. The respondents are aware of the importance of financial innovations for maintaining competitiveness and adapting to changing market demands, with particular emphasis placed on the role of digital technologies in transforming banks' business models and incorporating sustainability considerations into operations, including their contribution to financial inclusion. Financial innovations are not limited exclusively to technological solutions; rather, they also encompass organizational, process-related, and strategic changes within institutions themselves. The research identified numerous ways in which banks integrate innovations into their day-to-day operations, including the development of mobile applications, digital wallets, cashless payment platforms, and software solutions for analyzing customer behavior and personalizing services. In addition, attitudes toward cooperation with Fintech companies were examined, revealing that respondents recognize the potential of such partnerships while simultaneously emphasizing the need for a clear regulatory framework to ensure the security and stability of the financial system. Furthermore, most respondents perceive digital transformation not as a threat to banks, but as an opportunity for further development, increased efficiency, enhanced customer experience, and strengthened financial inclusion. Respondents also identified changes in consumer behavior as a key driver of innovation, particularly the growing demand for greater accessibility, speed, and simplicity of financial services. Although certain threats arising from the Fintech sector exist, most respondents believe that Croatian banks actively follow global trends and successfully maintain their market positions.

Accordingly, financial innovations are not merely a response to current market trends, but rather a long-term process that shapes the way financial services are provided and the nature of relationships between banks and clients, contributing to the creation of a more transparent and user-oriented financial system. Respondents highlighted the necessity of continuous investment in employee education and monitoring global trends as key prerequisites for successful digital transformation. Moreover, the need for strategic consideration of the long-term effects of financial innovations on the stability and resilience of the banking system was emphasized. In conclusion, financial innovations represent an indispensable element of modern banking, and banks that successfully implement financial innovations while maintaining security, trust, and regulatory compliance have the greatest potential for sustaining competitive operations over the long term.

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