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The influence of financial innovation on the performance of banks in Tunisia: Insights from a survey

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***Abstract*---**This study was conducted to analyze the impact of financial innovation on bank performance, motivated by the low profitability and subsequent closures of certain banks due to the COVID-19 pandemic. Determinants of financial innovation were identified and included in the analysis to understand their relationship with bank profitability. Financial innovation encompasses the creation of new financial instruments, the adoption of new financial technologies, and the development of financial institutions and markets. An empirical study was carried out with a sample of 150 individuals at Banque Nationale Agricole Tunisia using a survey. The results indicate that Banque Nationale Agricole has taken significant steps to adopt new financial products and services, thereby strengthening its capital base and becoming a source of funding for research and development.

Keywords*---financial innovation, banking performance, BNA Tunisia*

Introduction

Trends toward financial globalization and regional integration have accelerated in recent years, driven by technological advances and the quest for risk diversification and operational efficiency. These factors are likely to encourage banking consolidation on an international scale. However, national disparities persist, leading to regulatory and informational barriers, often linked to cultural and institutional differences. These forces and constraints manifest differently

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depending on whether access to a new market is achieved through creation or acquisition. In the Tunisian context, banks have undergone significant changes in recent years, notably due to regulatory developments, the opening of borders, and free trade agreements with developed countries. These factors have increased certification requirements for banking products and services. For banking institutions, financial innovation has become a crucial strategic issue, aimed at capitalizing on technological opportunities. In a highly competitive environment, it is essential for maintaining performance. Consequently, it has garnered considerable attention from both practitioners and researchers who are striving to understand this innovation process. Financial innovation generally manifests in the introduction of new products and services in the financial market. While we often expect a clean break from existing products, it is important to note that innovation can also involve modifications to existing financial products. In other words, whether through the creation of new products or the enhancement of existing ones, banks are securing their future by adopting effective strategies to compete in an increasingly intense market. Innovation encompasses both the introduction of new financial products and services and the adoption of new financial technologies. In the wake of recent financial crises, the adoption of financial innovation by banks has become a necessity rather than a choice. Financial innovation is now seen as a key element for banks to remain competitive. In light of this, we decided to explore the concept of 'financial innovation', evaluate its measurement, and analyze its influence on the performance of National Agricultural Bank Tunisia. Our research aims to answer the following question: What is the impact of financial innovation on banking performance in Tunisia?

To address this question, our work is structured as follows: Section 2 provides a literature review. In Section 3, we outline the study's methodology and results. Section 4 concludes the study.

The importance of financial innovation in the banking sector

In today's banking landscape, competition is fiercer than ever, prompting banks to make crucial strategic choices to ensure their survival. Financial innovations have become key strategic levers for banks, enabling them to diversify their offerings and secure their long-term market presence. These innovations help overcome operational challenges, fostering lasting and stable relationships with customers. Technological advances, particularly in information and telecommunications, have lowered barriers to entry in banking markets, promoting greater scale and accelerating the adoption of financial innovations. Changing customer needs have also reshaped the competitive landscape, urging banks to adapt quickly to remain relevant. Evidence shows that banks adopt innovations in response to competitive and institutional challenges. The primary objective of any financial innovation is to achieve financial equilibrium or generate profits, thereby ensuring the sustainability and continued development of the banking sector.

The link between financial innovation and financial performance

In a globalized context marked by technological advances, the pursuit of risk diversification, and the optimization of efficiency, financial innovation has become a key driver of consolidation in the banking sector. This trend underscores the vital role of financial innovation in stimulating economic growth and generating substantial wealth. Despite its significant impact, few studies have directly examined the relationship between innovation and banking performance. The evolving demands of economic actors have led to transformative changes in financial services, reshaping the economic landscape. Tunisia, for instance, began implementing a comprehensive modernization program for its financial system in 1997, driven by banks' desire to enhance performance and gain a competitive edge through innovation. Financial innovations can improve banking performance in various ways, influencing multiple performance dimensions such as output, market presence, and profitability. Research by Walker (2004) highlights that innovation enhances market position, translating into competitive advantages and superior performance. Numerous studies have found a positive correlation between financial innovation and improved banking performance, often due to innovative banks' ability to self-finance their projects, linking profitability with innovation. The Tunisian banking sector, having undergone a growth phase due to deregulation and financial liberalization, has seen the emergence of new products (e.g., savings products and currency hedging), new markets (e.g., consumer credit), new activities (e.g., financial engineering), and new players (e.g., specialized financing institutions). These developments have increased competition, positively impacting banking performance by driving economic benefits. Despite extensive research in the United States and other developed countries on banking performance and economic development, studies focusing on banks in developing countries, particularly Tunisia, are limited. Notable research, such as Chaffai (1998), has analyzed the efficiency of Tunisian commercial banks, emphasizing the positive impact of financial liberalization. Other studies, including Rajhi (2008), have explored the role of new technologies in enhancing banking performance, revealing their crucial role in sector evolution and competition. Reforms in the Tunisian banking sector, along with the introduction of international institutions, have intensified competition, prompting banks to improve efficiency to stay competitive. In summary, these studies highlight the importance of efficiency and innovation in Tunisia's banking sector, driven by structural and technological reforms that foster a competitive environment conducive to growth and diversification in banking activities.

Literature Review

Atukunda et al. (2024) examined the effect of financial innovations on the profitability of commercial banks in Uganda, using data from 24 banks collected via questionnaires. They found a positive and significant correlation between both process and product innovations and the banks' profitability. Chimanga and Kawimbe (2023) investigated the impact of mobile banking on the financial performance of commercial banks in Zambia through a descriptive research design involving 101 respondents from FNB Bank in Lusaka. Their results highlighted the substantial potential of mobile banking, though it has yet to be fully exploited, suggesting that strategic integration of mobile banking services could enhance financial performance. Schipor and Duhnea (2021) studied consumer acceptance of digital banking services in Romania, focusing on students' attitudes towards fintech. They found a link between financial knowledge and fintech preferences, underscoring the growing significance of financial technology among the younger generation. Reshid (2020) assessed the impact of financial innovations, including mobile banking, internet banking, and ATMs, on the operational performance of commercial banks in Ethiopia. The study confirmed that these innovations positively and significantly impact operational performance. Kiplangat and Tibbs (2018) analyzed the effects of financial innovations on the financial performance of commercial banks in Kenya, using a sample of 170 individuals. Their research emphasized that innovations, particularly mobile banking, significantly boost financial performance. Cherotich et al. (2015) also found a strong correlation between financial innovations and the financial performance of banks in Kenya. Similarly, Domeher et al. (2014) noted that the alignment of innovations with customer needs and the level of customer education positively affect the adoption of online banking in Ghana. Lerner and Tufano (2011) argued that financial innovations, such as venture capital, equity funds, mutual funds, exchange-traded funds, and securitizations, play a crucial role in financial deepening and growth.

The literature indicates that financial innovations have a generally positive impact on bank performance, particularly in terms of profitability and operational efficiency. However, the success of these innovations is influenced by customer acceptance, education, and regulatory environments. Further research is needed to explore the long-term implications and contextual variations in the effectiveness of financial innovations.

Methodology, Results and Discussion

This section analyzes the impact of financial innovation on the performance of Banque Nationale Agricole (BNA). It concludes by identifying the challenges and opportunities associated with innovation within the bank. We conducted a survey of 150 BNA customers in Sousse, Tunisia, using a questionnaire with 13 questions. The key findings from this survey are summarized below:

Table1
Descriptive analysis of the sample

Characteristics of the sample		%
Gender	Male	33.6%
	Female	66.4%
Age	Less than 18 years	7%
	Between 18-23 years	35%
	Between 23-30 years	32%
	Between 30-40 years	15%
	More than 40	11%
Educational profile	Secondary education	19%
	Bachelor’s degree	42%
	Master’s degree	31%

	Doctoral degrees	8%
Customer Tenure	Less than a year	29%
	Between 1-3 years	34%
	Between 3-5 years	24%
	More than 5 years	13%
Service usage frequency	Daily	17%
	Weekly	34%
	Monthly	27%
	Rarely	22%
Impact of Financial Innovation on Performance	1	2%
	2	3.3%
	3	25.3%
	4	36%
	5	33.3%
Impact on Customer Experience	Not improved at all	16%
	Slighlty improved	38.7%
	Moderately improved	26.7%
	Greatly improved	18.7%
Perceived Contribution to Service Quality	Yes	82.7%
	No	17.3%
Perception of BNA’s financial innovations	Mobile banking	42.7%
	Fintech	37.3%
	Artificial intelligence	52%
	Blockchain	27.3%
	Other	5.3%
BNA’s Competitive Position	Very advanced	28.7%
	Ahead	37.3%
	Average	28%
	Behind	5.3%
	Very behind	0.7%
The Importance of Innovation for BNA	1	1.3%
	2	6.7%
	2	17.3%
	4	39.3%
	5	35.3%
The level of engagement with BNA’s new financial services or products	Yes	76.7%
	No	23.3%

Source: author’s compilating using the questionnaire

The data shows that BNA serves a wide range of age groups, demonstrating its appeal and accessibility to both younger and older customers. A significant portion of BNA's customers are young adults, with 67% of respondents aged between 18 and 30. This suggests that BNA's products and services are particularly attractive to younger demographics. The lower percentage of customers under 18 and over 40 might indicate potential areas for BNA to expand its reach and tailor specific products for these age groups. These insights highlight BNA's strong presence among young adults and suggest potential growth opportunities to further engage other age segments.

A substantial majority of BNA’s clients have higher education qualifications. Specifically, 42% of respondents hold a bachelor’s degree and 31% have a master’s degree. This indicates a highly educated customer base. While higher education degrees are predominant, there is still a significant portion of clients with secondary education (19%) and doctoral degrees (8%), indicating a diverse educational background among the clientele. The data suggests that BNA has successfully engaged a well-educated and youthful demographic, which can be leveraged to further innovate and tailor financial solutions that meet the evolving needs of this key customer base.

A significant portion of BNA's customers (29%) have been with the bank for less than a year, indicating a strong influx of new clients. This suggests successful customer acquisition strategies and growing interest in BNA's offerings. The largest group of respondents (34%) have been clients for 1 to 3 years, showing that a significant number of customers are in the early stages of their relationship with the bank, potentially indicating room for further engagement and loyalty-building activities. 24% of customers have been with BNA for 3 to 5 years. This group represents a stable customer base that has likely experienced multiple banking services and products over time. 13% of respondents have been customers for more than 5 years, reflecting a loyal segment that has maintained a long-term relationship with BNA. This group can provide valuable insights into customer satisfaction and retention strategies.

A significant portion of clients, 34%, use BNA services weekly. This indicates that a substantial number of customers are actively engaging with the bank’s offerings on a regular basis. Frequent weekly use suggests a high level of satisfaction and reliance on BNA’s services, which may correlate with greater customer loyalty. With 27% of clients using BNA services monthly, this group demonstrates moderate engagement. They interact with the bank’s services on a less frequent basis than the weekly users but still maintain a regular relationship.

This segment might benefit from targeted marketing or personalized offers to increase the frequency of their service usage. 22% of clients use BNA services rarely. This indicates that while they are customers, they do not frequently engage with the bank’s offerings. Strategies could be implemented to understand why these clients use services infrequently and how BNA might increase their engagement. This could involve exploring the reasons for their rare use, such as dissatisfaction or a lack of need for frequent banking services. 17% of clients use BNA services daily, reflecting a high level of dependence on the bank’s offerings. This group likely includes individuals who require constant access to banking services for transactions or financial management. Daily users might benefit from advanced or premium services that cater to their frequent needs, enhancing their banking experience.

A significant number of respondents view financial innovation as having a substantial impact on BNA’s profitability: 33.3% rate its potential impact as a 5, indicating a strong belief in its profitability potential. 36% rate it as a 4, reflecting high confidence in its positive effect. 25.3% rate it as a 3, suggesting a moderate impact. 5.3% rate it as a 2 or lower, expressing some skepticism or concerns regarding the innovation's effectiveness.

The largest segment of respondents feels that BNA's financial innovations have resulted in only slight improvements to their customer experience. This suggests incremental benefits that may not be fully satisfying all customer needs. A smaller but notable percentage of respondents report significant enhancements to their customer experience due to BNA's innovations. This indicates that some innovations are well-received and have made a substantial impact on certain users. A quarter of respondents observe a moderate improvement, reflecting a positive, though not transformative, effect of the innovations on their overall experience. 16% of respondents feel that financial innovations have not made any difference to their customer experience. This group might be experiencing limited interaction with new features or may not perceive the changes as beneficial. The varied responses highlight that while many customers appreciate the improvements, there is a significant portion who either see minimal benefit or no change. This suggests that the impact of innovations is not uniform across all customer segments. The range in responses indicates room for further enhancement of financial innovations. Addressing the needs of those who see only slight or no improvement could be crucial for maximizing overall customer satisfaction. For those who reported significant or moderate improvements, it is important to identify which specific innovations were most impactful and leverage this information to refine and expand successful features.

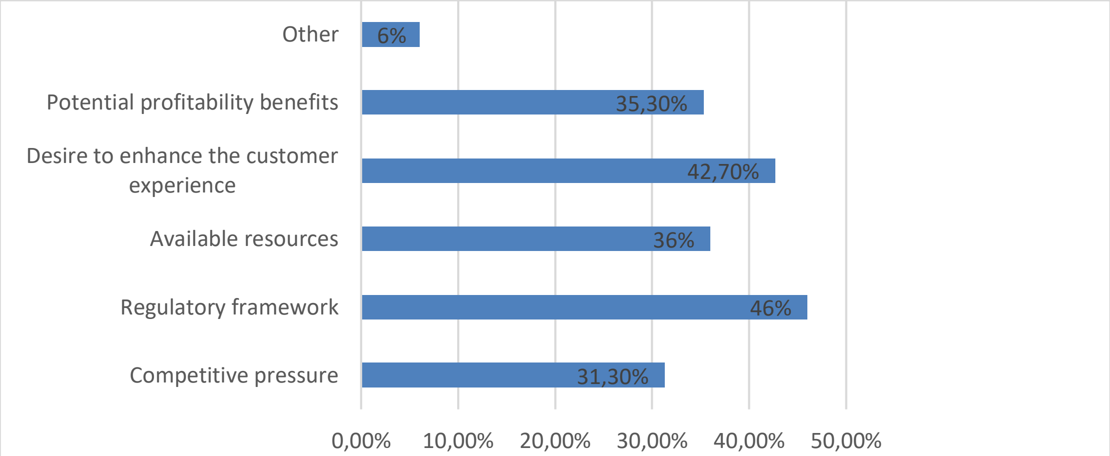
A clear majority (82.7%) of respondents have noticed an improvement in service quality since the introduction of new financial initiatives or products. This is a strong indicator of positive reception towards the innovations, although 17.3% of respondents have not experienced any noticeable enhancement in service quality.
The findings indicate that BNA's focus on artificial intelligence is most recognized by respondents, followed by mobile banking and fintech solutions. Blockchain is also noted, though to a lesser extent, and a small percentage of respondents did not express a clear opinion. With 52% of respondents identifying artificial intelligence as a major innovation, it is clear that AI is the most recognized and possibly the most impactful technology introduced by BNA. This suggests a strong public awareness and appreciation of AI-driven features or services. Mobile banking is highlighted by 42.7% of respondents, indicating that it is a significant area of focus for BNA. This reflects the growing importance of mobile platforms in the banking sector and their relevance to a substantial portion of BNA's customer base. Fintech is recognized by 37.3% of respondents as a key innovation, showing that BNA's efforts in this area are notable but slightly less prominent compared to AI and mobile banking. Fintech solutions are likely contributing to the bank's modern approach to financial services. Blockchain Recognition: At 27.3%, blockchain technology is acknowledged by a smaller, yet still significant portion of respondents. This indicates that while blockchain is an important innovation, it may not be as widely adopted or understood as AI and mobile banking. The 5.3% of respondents who had no opinion on the types of innovations suggest that there is a small segment of the customer base that is either unfamiliar with or indifferent to BNA's innovations.

The survey results show that 28% of clients consider BNA's financial innovations to be on par with industry standards. 37.3% of clients view BNA as ahead of its competitors in terms of innovation. 28.7% of clients believe BNA's innovations are significantly more advanced than those of its competitors. These findings suggest that a substantial portion of clients perceive BNA's financial innovations as either ahead of or significantly more advanced compared to the competition, indicating a strong competitive edge in innovation.

This figure shows that 35.3% of respondents view financial innovation as extremely important for BNA. 39.3% consider it to be important. 17.3% rate it as moderately important. 6.7% believe it is of lesser importance. These results highlight that a significant majority of respondents recognize financial innovation as a crucial factor for BNA, underscoring its strategic value in driving the bank's success and competitive edge.

The results show that a significant majority of respondents (76.7%) actively utilize the new financial services or products provided by BNA. In contrast, 23.3% of respondents do not engage with these new offerings.

The primary factors influencing BNA's decision to adopt financial innovations

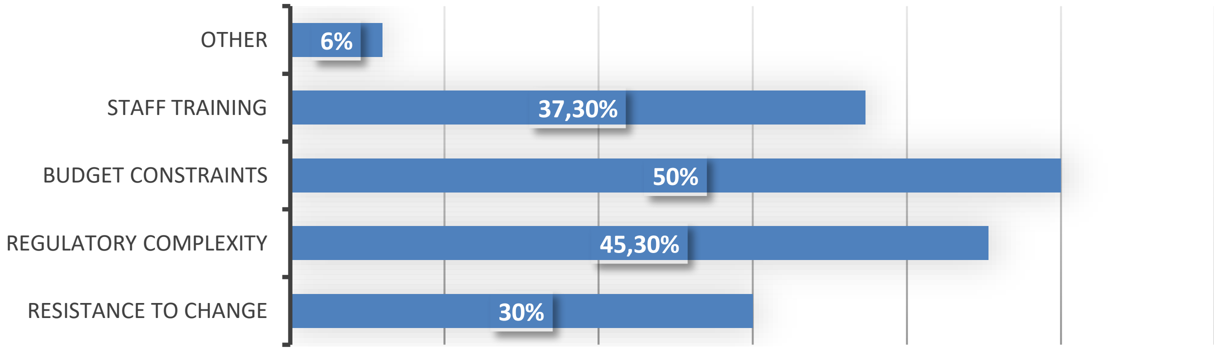


Source: Author

Figure 1. Key Factors Influencing BNA's Decision-Making

The survey results reveal that 42.7% of respondents identified enhancing the customer experience as a major factor driving BNA's adoption of financial innovations. 46% pointed to the regulatory framework as a significant influence on BNA's decision-making process. 36% noted that the availability of resources plays a key role in shaping BNA's innovation strategies. 35.3% highlighted the potential for profitability as an important factor in adopting new financial innovations. 31.3% mentioned competitive pressure as a contributing factor to BNA's innovation decisions. 6% of respondents cited additional, unspecified factors influencing BNA's innovation choices.

The main challenges associated with implementing financial innovations at BNA



Source: Author

Figure 2. Primary Challenges in Implementing Financial Innovations at BNA

The survey data reveals 50% of respondents identified budget constraints as a major obstacle to implementing financial innovations. 45.3% highlighted the complexity of regulatory requirements as a significant challenge. 37.3% noted that inadequate staff training is a key issue in the adoption of new innovations. 30% pointed out resistance to change as a notable barrier. 6% of respondents mentioned various other factors not specified in the survey. These insights suggest that BNA faces considerable hurdles in financial innovation, with financial limitations, regulatory hurdles, and the need for staff development being the most prominent challenges.

Conclusion and Recommendations

The global economy today is marked by intense competition and rapid technological advancements, which are significantly transforming the financial sector and influencing banking performance. This study examines the impact of financial innovation on the performance of the National Agricultural Bank (BNA) in Tunisia. Our findings reveal that banks embracing innovation typically achieve higher profitability, gain a competitive advantage, and capture a larger market share. Additionally, effective adoption of financial innovations enhances financial efficiency and facilitates the integration of new technologies. In conclusion, the National Agricultural Bank places a strong emphasis on integrating financial innovation into its products and services. Our empirical results indicate that proactive adoption of new financial products and services boosts capital and supports research and development initiatives. To enhance profitability and reduce costs, Tunisian banks should actively promote and invest in financial innovations. Staying competitive in an evolving financial landscape requires increased engagement with innovation and greater public awareness of its benefits. To address current challenges and opportunities, we recommend the following actions:

- Develop Specialized Training: Address the knowledge gap among the 21% of respondents who lack understanding of financial innovation by creating tailored training programs. These should cater to various demographic groups, including different age ranges and educational levels.

- Enhance Communication Materials: Improve the clarity and appeal of communication materials regarding financial innovations. Use diverse media formats such as videos, infographics, and webinars to engage a wider audience effectively.
- Showcase Success Stories: Provide case studies and success stories that demonstrate the tangible benefits of financial innovation. Highlight real-world examples of how these innovations have positively impacted BNA's performance and customer experience.
- Focus on Urban and Rural Areas: While continuing to leverage innovations in urban settings, ensure that services are accessible and beneficial to all clients, including those in rural areas. Develop targeted strategies to promote financial inclusion in these regions, such as mobile banking units, partnerships with local organizations, and outreach programs.
- Collaborate with Government and Fintech Companies: Work with government agencies and regulatory bodies to align innovation strategies with broader financial inclusion and economic development goals. Explore partnerships with fintech companies to integrate advanced technologies and expand BNA's service offerings.

By adopting these strategies, Tunisian banks can enhance their performance, foster financial inclusion, and remain competitive in the dynamic financial landscape.

Author Contributions

Arij BEN MAHMOUD: Conceptualization, Data curation, Formal Analysis, Resources, Software, Visualization, Writing – original draft.

Jihene KHALIFA: Conceptualization, Investigation, Methodology, Resources, Supervision, Validation, Writing – review & editing.

Conflicts of Interest

The manuscript has not been published elsewhere and is not under consideration by other journals. The authors declare no conflicts of interest.

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