


Leveraging Robo-Advisory Services for Bank Competitiveness: A Case Study of First National Bank Botswana

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Abstract

This study investigates the capacity of robo-advisory services to improve financial institutions like First National Bank Botswana's (FNBB) competitiveness within a changing digital financial environment. While AI-driven financial advisory services are gaining popularity globally, their implementation in developing nations is still constrained. This research utilises a mixed-methods approach, integrating semi-structured interviews with 15 FNBB management and surveys of 29 FNBB customers to evaluate awareness, desire to accept, and concerns related to robo-advisory services. Due to participant availability limits, purposive and convenience sampling were used to engage respondents who actively utilise digital banking services and may provide relevant views. The results indicate that FNBB may bolster client retention, augment operational efficiency, and secure a competitive edge through the adoption of robo-advisory services. Obstacles to adoption include confidence in AI-driven decision-making, regulatory ambiguity, and data security threats must be resolved. This research enhances the existing literature on artificial intelligence in African financial services and provides pragmatic advice for banks contemplating the use of robo-advisory services, especially in developing economies.

Keywords

Digital Banking, Robo-Advisors, AI in Finance, Financial Technology, Financial Inclusion, Competitive Strategy

1. Introduction

1.1. Background and Research Motivation

The financial services sector is experiencing a fast digital revolution, propelled by

innovations in artificial intelligence (AI), machine learning (ML), and big data analytics (Arner et al., 2022; Jung et al., 2023). As client expectations evolve towards more personalised, efficient, and cost-effective financial services, banks and financial institutions are progressively embracing fintech technologies to maintain competitiveness (Huang et al., 2023). Robo-advisory services have emerged as a disruptive force in wealth management and financial planning conversations, enabling people to get automated, data-driven investing advice with minimum human participation (Nguyen et al., 2023).

Robo-advisory systems use sophisticated algorithms and AI-driven risk evaluations to provide tailored investment suggestions, often at a far lower cost than conventional financial advisers (Chen et al., 2023). Their advantages include continuous availability, diminished management expenses, improved portfolio diversification, and more accessibility for individual investors (Ghelani et al., 2022). The benefits of robo-advisors have led to their widespread adoption in developed countries, with prominent global companies like Betterment, Wealthfront, and Vanguard effectively incorporating AI into their financial management services (Fan & Chatterjee, 2020). The implementation of robo-advisory technology in emerging markets, such as Botswana, is still in its early stages due to regulatory ambiguities, deficiencies in technological infrastructure, cybersecurity issues, and consumer scepticism regarding AI-based financial decision-making (Chen et al., 2023; Poel & Kudina, 2022).

Africa's fintech industry is seeing fast expansion, particularly in Nigeria, Kenya, and South Africa, where there is notable development in mobile banking, digital lending, and AI-enhanced financial services (Arner et al., 2022). Nevertheless, the adoption of robo-advisory services remains minimal across the continent, as financial institutions contend with trust deficits, insufficient financial literacy among prospective customers, and inadequate AI regulatory frameworks (Ringe & Ruof, 2021). Botswana, while one of the most economically stable nations in Sub-Saharan Africa, has comparable issues. Despite the increasing popularity of mobile money platforms and digital banking services in the nation, there is little to no incorporation of robo-advisory services inside conventional banking operations (ICS, 2022).

1.2. FNBB and the Prospects for Robo-Advisory Services

First National Bank Botswana (FNBB), a leading and technologically advanced commercial bank in Botswana, has been a trailblazer in digital banking. In the last ten years, FNBB has launched mobile banking, and improved digital payment systems, establishing itself as a frontrunner in Botswana's fintech landscape (FNBB, 2022). Nonetheless, despite its achievements in digital banking innovation, FNBB has yet to provide robo-advisory services, resulting in a notable deficiency in AI-driven wealth management solutions within Botswana's financial sector.

This research examines whether financial institutions can use robo-advisory technology to improve client engagement, operational efficiency, and market

competitiveness. Financial institutions may augment customer experience and boost cost efficiency, broaden market penetration, and acquire a competitive edge by using robo-advisory services. However, financial institutions must also address key challenges, including customer skepticism, regulatory barriers, cybersecurity risks, and other issues.

1.3. Research Aims and Importance

The objective of this research is to:

- Assess client impressions of robo-advisory services.
- Evaluate financial institutions preparedness for the implementation of AI-driven financial advising solutions.
- Identify the regulatory, technical, and operational hurdles that might affect adoption.
- Offer strategic ideas for financial institutions to effectively incorporate robo-advisory services within its banking framework.

This research addresses these objectives by enhancing the existing literature on AI-driven financial services in Africa, offering insights that may inform fintech policy development, strengthen financial inclusion initiatives, and direct digital transformation strategies within the banking sector.

2. Literature Review

2.1. Theoretical Framework for Robo-Advisory Services

There are many theoretical perspectives that may be used to understand the acceptance and efficacy of robo-advisory services in banking. These include the areas of financial decision-making, technology adoption, and the use of artificial intelligence (AI) in financial services. This section describes three important theoretical frameworks that provide a systematic understanding of how robo-advisors affect client behaviour, the competitiveness of banks, and the regulatory environment.

2.1.1. Technology Acceptance Model (TAM)

One of the most often utilised models for understanding how users accept technology-driven services is the Technology Acceptance Model (TAM), which was established by Davis in 1989. According to the Technology Acceptance Model (TAM), there are two main elements that influence the acceptance of new technology: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) (Venkatesh & Davis, 2000).

PU, in the context of robo-advising services, relates to how much clients trust that AI-driven financial advisory systems may help them make better investing choices, increase portfolio diversification, and lower advisory costs (Nguyen et al., 2023). On the other hand, PEOU refers to how clients perceive the ease and intuitiveness of using robo-advisors in comparison to conventional financial advising services (Huang et al., 2023). If clients believe that robo-advisory systems are sim-

ple to use and help them make better investing decisions, they are more inclined to start using them.

TAM has been used in several studies in the fintech sector, which have shown that customers who are more digitally literate and have a positive attitude towards AI-based services are more likely to adopt robo-advisors (Chen et al., 2023). Nevertheless, there are obstacles to wider adoption, including a lack of confidence in decision-making driven by artificial intelligence, worries about security, and ambiguities around regulations (Ghelani et al., 2022).

2.1.2. Theory of Diffusion of Innovation (DOI)

Rogers' Diffusion of Innovation (DOI) Theory (Rogers, 2003) offers another important viewpoint for examining how robo-advisory services are adopted in the banking industry. The DOI divides customers into five adoption groups: Innovators, Early Adopters, Early Majority, Late Majority, and Laggards (Rogers, 2003).

In many countries, including Botswana, robo-advisory services are still in the early stages of development within the banking sector. The Innovators and Early Adopters, who are usually knowledgeable about technology and finance, are more open to trying out investing platforms that use artificial intelligence (Huang et al., 2023). On the other hand, the Early Majority and Late Majority tend to wait for regulatory clarity, established security measures, and more client testimonials before they accept financial planning services that are powered by artificial intelligence (Jung et al., 2023).

The DOI also highlights five important characteristics that affect the adoption of technology:

Relative Advantage: Robo-advisors are more cost-effective, efficient, and offer ongoing financial monitoring as compared to human advisors (Nguyen et al., 2023).

Compatibility: consumers who are already acquainted with online banking and AI-powered suggestions tend to adopt these technologies at a greater rate. This is especially true for consumers who are financially competent and technologically literate (Chen et al., 2023).

Complexity: If clients find robo-advisors difficult to use, they are less likely to embrace them. This highlights the need of having user-friendly interfaces and financial education initiatives (Ghelani et al., 2022).

Trialability: Financial institutions that provide demo versions or trial-based access to robo-advisors may promote wider adoption (Huang et al., 2023).

Observability: Positive experiences and testimonies from early adopters may encourage mainstream acceptance (Jung et al., 2023).

2.1.3. Ethical Considerations of AI and Trust Theory

According to the Trust Theory in financial services, trust is the most important factor in making financial decisions, especially when it comes to investments led by artificial intelligence (Mayer, Davis, & Schoorman, 1995). Customers need to have faith that robo-advisors powered by artificial intelligence would operate in

their best financial interests, keep their data private, and give investment recommendations that are reliable and free of prejudice (Jung et al., 2023).

Three components of trust theory in Robo-advisory adoption include:

Competence Trust: Customers must have faith that AI-based systems can make trustworthy investment judgements and that they have the technical precision to do so (Nguyen et al., 2023).

Integrity Trust: Financial institutions must guarantee that their AI decision-making is transparent and that they comply with ethical banking rules to prevent algorithmic biases (Chen et al., 2023).

Benevolence Trust: Robo-advisory platforms need to put the interests of their customers ahead of their own profits. This will help them avoid conflicts of interest that might occur in investment management that is powered by artificial intelligence (Huang et al., 2023).

Ethical issues are also an important factor in the development of trust and regulatory laws around robo-advisory services. There has been an increase in discussions on the need of hybrid models that combine human financial advisers with AI-driven platforms. This is due to problems such as algorithmic biases, a lack of human oversight, and possible mistakes in investment strategies that are driven by AI (Ringe & Ruof, 2021).

2.2. Robo-Advisory Adoption in Emerging Markets

The adoption of robo-advisory services has been significantly faster in developed economies due to a well-established digital banking ecosystem, clear AI regulations, and high consumer trust in automated financial services (Fan & Chatterjee, 2020). Financial institutions in the United States, Europe, and parts of Asia have successfully integrated AI-driven financial planning tools, offering low-cost, 24/7 investment advisory solutions to retail and institutional clients. In these regions, the success of robo-advisors is driven by several key factors, including mature fintech infrastructure, strong cybersecurity frameworks, and widespread digital literacy (Nguyen et al., 2023).

However, the same level of success has not been replicated in Sub-Saharan Africa, where the adoption of AI-driven financial services remains limited. Studies suggest that regulatory gaps, consumer skepticism, and technological infrastructure constraints continue to hinder the integration of robo-advisors in African banking systems (Chen et al., 2023; Arner et al., 2022). Unlike developed economies, where AI is widely accepted as a decision-making tool, African consumers often lack confidence in fully automated financial systems, preferring the reassurance of human financial advisers (Poel & Kudina, 2022).

Despite the rapid digital transformation in African banking, robo-advisory services have not yet gained widespread traction, highlighting the gap between fintech potential and actual market adoption (Chen et al., 2023). A comparative analysis of Kenya and South Africa, two of Africa's leading fintech markets, provides valuable insights into the barriers and opportunities for AI-driven financial

services in Botswana.

2.2.1. Kenya: Mobile Banking Success vs. Robo-Advisory Challenges

Kenya is one of Africa's most advanced digital banking markets, largely due to the widespread success of mobile money platforms like M-Pesa (Arner et al., 2022). M-Pesa has transformed financial inclusion, allowing millions of previously unbanked individuals to access financial services, make transactions, and receive credit through mobile banking. The adoption of mobile fintech solutions has outpaced traditional banking, demonstrating the high demand for digital financial services in the country (Fan & Chatterjee, 2020).

However, despite Kenya's fintech success, robo-advisory services have not yet achieved the same level of adoption. Research suggests that several socio-economic factors limit AI-driven investment advisory services in Kenya (Chen et al., 2023). Studies indicate that many consumers in Kenya lack the financial education needed to engage with AI-driven investment platforms, preferring simpler, transaction-based fintech solutions like mobile banking (Arner et al., 2022). Unlike mobile payments and lending services, which are transactional in nature, investment planning requires long-term financial commitment and trust. Many Kenyans prefer direct interactions with human financial advisors, viewing them as more reliable than algorithm-driven recommendations (Ghelani et al., 2022). Kenya has made significant progress in regulating digital banking, but robo-advisory services remain in a grey area. The lack of clear regulatory frameworks for AI-driven financial planning tools has led to uncertainty among banks and fintech firms (Poel & Kudina, 2022).

These challenges highlight a key research gap in Kenya's success in mobile banking proves that fintech can thrive in Africa, the same model does not necessarily translate to robo-advisory adoption. More research is needed to determine how financial literacy programs, consumer trust-building strategies, and regulatory reforms can drive AI adoption in wealth management.

2.2.2. South Africa: Hybrid Robo-Advisory Models and Consumer Trust Issues

South Africa represents a more structured and diversified financial market compared to Kenya, with a stronger emphasis on wealth management and investment services (Nguyen et al., 2023). Unlike Kenya, where mobile banking dominates the fintech sector, South Africa's financial ecosystem includes a mix of traditional banking institutions, investment firms, and digital financial platforms. This has created a more favorable environment for AI-driven financial planning tools, leading to the introduction of hybrid robo-advisory models. Several wealth management firms in South Africa have experimented with hybrid advisory services, where AI-driven recommendations are combined with human financial oversight (Nguyen et al., 2023). This model is designed to address consumer concerns about algorithmic decision-making while leveraging AI's cost-efficiency and automation capabilities.

However, despite these efforts, robo-advisory adoption in South Africa remains limited, particularly among older, conservative banking customers. Studies show that South African consumers, especially those over the age of 40, are reluctant to trust AI-driven investment models. Many associate investment managers with personal relationships, leading to low adoption rates for purely AI-driven advisory platforms (Jung et al., 2023). While South Africa has developed comprehensive fintech regulations, authorities remain cautious about fully regulating AI-driven financial decision-making. This has resulted in banks and fintech firms being hesitant to scale robo-advisory services due to compliance concerns (Poel & Kudina, 2022). Wealthier investors are more willing to experiment with hybrid robo-advisors, but low- and middle-income clients still rely on traditional banking institutions for financial planning (Chen et al., 2023).

South Africa's experience suggests that a fully AI-driven investment model may not be viable in markets where trust in digital financial decision-making is still evolving. Instead, hybrid advisory models—which retain human involvement while integrating AI-driven recommendations—may serve as a better alternative for emerging markets.

These gaps suggest that while AI-driven financial services hold promise for Botswana, their success will depend on how well they are adapted to local market conditions. Future studies should focus on consumer attitudes toward AI in financial planning, trust-building mechanisms, and the impact of hybrid advisory models on adoption rates.

2.3. Challenges Hindering Robo-Advisory Adoption in Africa

Despite the rapid growth of fintech in Africa, the adoption of robo-advisory services remains low, primarily due to regulatory gaps, consumer skepticism, and structural financial barriers (Chen et al., 2023; Arner et al., 2022). While digital banking and mobile money services such as M-Pesa in Kenya and MTN MoMo in Ghana have successfully expanded financial inclusion, the adoption of AI-driven wealth management tools has lagged. Studies suggest that this slow adoption is largely due to trust issues, lack of financial literacy, and an underdeveloped AI governance framework (Ghelani et al., 2022; Fan & Chatterjee, 2020).

One of the most significant barriers to robo-advisory adoption in Africa is the lack of clear regulations governing AI-driven financial services (Poel & Kudina, 2022; Arner et al., 2022). Unlike developed economies where fintech regulation has evolved alongside technological advancements, many African countries still operate under traditional banking laws that do not explicitly address AI-based financial advisory models (Chen et al., 2023). Studies indicate that the absence of specific AI compliance frameworks creates legal ambiguity for banks and fintech firms, discouraging them from fully integrating robo-advisory services (Nguyen et al., 2023). Regulators in South Africa and Nigeria have made progress in defining fintech guidelines, but AI-driven investment tools remain under-regulated,

leading to uncertainty about accountability and compliance (Gomber et al., 2018). The lack of AI-specific regulations raises concerns about liability issues—for example, who bears responsibility if a robo-advisor provides misleading financial recommendations or fails to anticipate market risks? (Ringe & Ruof, 2021). While some scholars argue that self-regulation by financial institutions could fill this regulatory gap, others warn that without external oversight, the risk of unethical AI-driven financial practices increases (Bruckes et al., 2022). Future research should explore how African regulators can develop AI governance policies that ensure innovation while protecting consumer rights.

With the increasing digitization of financial services, consumer data privacy and cybersecurity risks have become major barriers to robo-advisory adoption (Chen et al., 2023; Ghelani et al., 2022). AI-driven investment platforms rely on extensive consumer data to make personalized financial recommendations, raising concerns about unauthorized access, data breaches, and financial fraud (Ringe & Ruof, 2021). A study by Arner et al. (2022) found that African consumers are particularly cautious about sharing their financial data with AI-driven platforms, fearing hacking risks and misuse of personal information. Unlike Europe, where regulations like the General Data Protection Regulation (GDPR) protect consumer financial data, many African countries lack strict data protection laws, leading to uncertainties about how financial institutions handle AI-driven decision-making processes (Nguyen et al., 2023). Research highlights past incidents of cyber fraud in African fintech, reinforcing consumer skepticism about digital financial tools (Gomber et al., 2018). While some African countries have introduced data protection policies, such as Kenya's Data Protection Act (2019) (Government of Kenya, 2019) and Nigeria's NDPR (National Data Protection Regulation) (National Information Technology Development Agency, 2019), enforcement remains weak. Studies suggest that banks must take proactive measures to ensure AI-powered financial platforms comply with international security standards (Bruckes et al., 2022; Chen et al., 2023). A key research gap in this area is the lack of empirical studies on consumer attitudes toward AI-driven financial data processing in Africa. Further investigation is needed to determine what cybersecurity measures would best increase trust in robo-advisory services among African consumers.

Another major challenge to robo-advisory adoption in Africa is the low level of financial literacy, particularly regarding automated investment tools (Nguyen et al., 2023; Poel & Kudina, 2022). While mobile money services have helped increase financial inclusion, they typically involve basic transactions rather than complex investment decision-making (Fan & Chatterjee, 2020). Studies indicate that many consumers in emerging markets struggle to understand how AI-driven financial tools function, leading to hesitation in trusting robo-advisors for wealth management (Ringe & Ruof, 2021). Research by Ghelani et al. (2022) found that, in South Africa and Kenya, even financially active individuals showed reluctance to use robo-advisors, largely due to uncertainty about how AI algorithms make invest-

ment decisions. Additionally, AI models tend to assume that investors have a basic understanding of financial planning, yet many African consumers lack access to structured financial education, further widening the adoption gap (Bruckes et al., 2022). This financial knowledge gap suggests that even if AI-powered investment tools become available, many consumers may not know how to effectively use them (Chen et al., 2023).

The challenges discussed above highlight significant gaps in research on AI-driven financial services in Africa. While existing studies provide valuable insights into regulatory, privacy, and financial literacy barriers, further research is needed to explore practical solutions for overcoming these challenges. These research gaps suggest that while robo-advisory services have significant potential in Africa, their success will depend on how well financial institutions address regulatory barriers, enhance data security, and educate consumers on AI-driven financial planning. While fintech continues to evolve in Africa, AI-driven robo-advisory services face unique adoption barriers due to regulatory uncertainty, privacy concerns, and low financial literacy. The absence of specific AI governance policies raises compliance risks, making financial institutions reluctant to fully integrate robo-advisors into their offerings (Poel & Kudina, 2022; Arner et al., 2022). Additionally, consumer concerns about cybersecurity and data misuse highlight the need for banks to implement stronger data protection frameworks (Chen et al., 2023). Finally, the lack of financial literacy initiatives tailored to AI investment tools suggests that banks must develop strategic educational programs to increase trust and adoption rates (Nguyen et al., 2023).

2.4. Ethical Considerations in AI-Driven Financial Services

As artificial intelligence (AI) revolutionizes financial services, it brings both opportunities and challenges. Robo-advisory platforms offer cost efficiency, accessibility, and automation, but they also raise ethical concerns about algorithmic bias, transparency, and data privacy (Poel & Kudina, 2022; Arner et al., 2022). If these concerns are not addressed, they could undermine consumer trust, deepen financial inequalities, and hinder AI adoption in emerging markets like Botswana (Ringe & Ruof, 2021; Ghelani et al., 2022).

Despite the promise of AI-driven financial decision-making, these systems are not immune to bias or ethical shortcomings. Historical data patterns and unclear algorithmic models often mean that AI-driven financial tools replicate existing financial inequalities rather than mitigating them (Nguyen et al., 2023). AI models are often praised for their objectivity, but the reality is far more complex. AI-driven financial models are only as unbiased as the data they are trained on (Ringe & Ruof, 2021; Jung et al., 2023). If past financial decisions were influenced by discriminatory lending practices, socio-economic inequalities, or historical banking exclusions, AI algorithms risk perpetuating these biases in investment recommendations.

Key manifestations of bias in robo-advisory services include the exclusion of

lower-income clients from premium financial opportunities, as AI-driven models tend to prioritize high-net-worth individuals, reinforcing wealth concentration and reducing access to higher-yield investments for middle- and lower-income clients (Bruckes et al., 2022). AI models also penalize clients with irregular income streams, as small business owners, gig workers, and informal sector employees often do not fit traditional banking profiles, leading AI models to classify them as high-risk, thereby restricting their access to long-term financial products (Poel & Kudina, 2022; Ghelani et al., 2022). Additionally, studies have found that gender-based financial data gaps can lead AI models to offer less aggressive investment portfolios to women, assuming lower risk tolerance, despite no clear evidence supporting such generalizations (Chen et al., 2023). The ethical challenge is clear, if AI models reinforce existing financial inequalities rather than reducing them, their role in promoting financial inclusion is fundamentally compromised.

One of the biggest barriers to consumer adoption of robo-advisory services is the lack of transparency in AI-driven financial decisions (Nguyen et al., 2023). Many AI models function as “black boxes”, making it difficult for customers—and even financial regulators—to understand how investment recommendations are made (Bruckes et al., 2022). This lack of clear lines in decision-making raises serious ethical and regulatory concerns such how customers can trust AI-generated financial advice, how it assigns their risk profile (Ringe & Ruof, 2021). The other concern is who takes the responsibility if an AI-driven investment portfolio performs poorly (Poel & Kudina, 2022). However, Ghelani et al. (2022) indicates that consumers are more likely to trust AI-driven financial planning tools if they understand how recommendations are generated. Explainable AI (XAI) offers a potential solution by making AI decisions more interpretable and user-friendly (Bruckes et al., 2022).

As financial services become more digitized, data privacy concerns continue to grow (Chen et al., 2023). Robo-advisory platforms rely on vast amounts of consumer data—including income patterns, spending habits, investment history, and even behavioural analytics—to make personalized recommendations. However, this heavy reliance on personal data creates significant cybersecurity risks (Nguyen et al., 2023). Key risks associated with AI-driven financial platforms include cyberattacks and financial fraud, as AI-driven banking platforms have increasingly become targets for hacking attempts, phishing attacks, and fraudulent transactions (Chen et al., 2023; Ringe & Ruof, 2021).

Unauthorized data sharing is also a concern, as in markets with weak regulatory oversight, customer data may be sold or shared with third-party financial institutions without explicit consent (Ghelani et al., 2022). Additionally, non-compliance with international data protection laws is a risk, as regions like Europe have implemented strong AI and data governance laws (e.g., GDPR), but many African countries lack comprehensive regulatory frameworks to protect consumer financial data (Arner et al., 2022).

2.5. Research Gaps

Despite the growing interest in AI-driven financial services, research on robo-advisory adoption in emerging economies is still limited. Most studies focus on Western markets, where digital banking infrastructure, AI regulation, and consumer trust in automation are more advanced (Arner et al., 2022; Chen et al., 2023). The African banking landscape presents unique challenges and opportunities that require further exploration. While some research has examined mobile fintech solutions in Africa, there is a significant gap in studies analyzing how robo-advisors can be adapted to the African financial context (Ghelani et al., 2022; Poel & Kudina, 2022). Trust barriers, regulatory uncertainties, and consumer adoption hesitations in Africa differ substantially from those in Western economies, necessitating localized research (Nguyen et al., 2023). Financial institutions like FNBB lack the necessary insights to tailor AI-driven investment solutions without Africa-specific data and case studies.

Another critical research gap is the lack of practical trust-building strategies for AI-driven financial decision-making in developing economies. Trust is consistently highlighted as a major obstacle to robo-advisory adoption, but few studies offer concrete, evidence-based solutions (Ringe & Ruof, 2021; Jung et al., 2023). Explainable AI models and algorithmic transparency are frequently proposed as solutions, but empirical research assessing their effectiveness in African markets is scarce (Bruckes et al., 2022). Additionally, African fintech regulation remains fragmented, with few clear guidelines on AI governance, consumer protection, and liability in algorithm-driven financial services (Chen et al., 2023). More research is needed to explore how emerging African economies can develop fintech-specific regulatory pathways that balance innovation with financial stability and consumer rights (Arner et al., 2022). Addressing these research gaps will enhance the banks' ability to integrate robo-advisory services effectively and contribute to a broader understanding of AI's role in shaping Africa's digital banking transformation. Context-specific approach, financial institutions can navigate the complexities of AI adoption while ensuring ethical, transparent, and inclusive financial services for all by developing a more informed.

3. Methodology

3.1. Research Design

The study adopts a mixed-methods approach to analyze how robo-advisory services impact FNBB's competitiveness and customer adoption behavior. The study ensures a balanced perspective on the strategic, operational, and consumer-related aspects of AI-driven financial advisory services by integrating qualitative and quantitative methodologies, (Creswell & Creswell, 2022; Bryman, 2016). The qualitative component involved semi-structured interviews with FNBB management and financial professionals, exploring the strategic feasibility of robo-advisors, regulatory considerations, and potential operational challenges. The quantitative component involved a customer survey distributed among FNBB clients, aimed

at capturing consumer perspectives on robo-advisory services. The study ensures that both institutional and customer perspectives are represented, strengthening the validity of findings through data triangulation and providing an understanding of robo-advisory feasibility in Botswana's banking sector by combining these approaches.

3.2. Sampling Technique and Sample Size

The study initially aimed to survey a larger sample of FNBB customers but, due to constraints, the final sample consisted of 29 clients. While smaller than planned, this sample is sufficient for an exploratory study, providing early-stage adoption trends and insights into customer perceptions of robo-advisory services (Mason, 2010). The study employed purposive sampling to select digitally engaged FNBB customers, ensuring relevant responses to the research objectives (Etikan et al., 2016). Convenience sampling was also used to recruit participants through FNBB's online banking forums and branch locations. This approach allowed for efficient data collection despite logistical constraints (Berndt, 2020).

The study's qualitative component included semi-structured interviews with 15 FNBB employees, comprising management and financial professionals. These interviews examined the strategic feasibility of robo-advisors, regulatory considerations, and potential operational challenges. The semi-structured format allowed for rich, context-specific data collection, ensuring that interviewees could elaborate on key themes while providing expert insights into the risks and opportunities of AI adoption in banking (Creswell & Creswell, 2022).

The research used a mix of purposive and convenience sampling to efficiently gather pertinent customer information. Purposive sampling was used to choose FNBB consumers who regularly utilise digital banking services, since these people were more likely to possess experience to fintech solutions and could provide informed insights on the uptake of robo-advisory services. The study focused on digitally connected customers to ensure that answers aligned with the research goals, enabling a concentrated review of AI-driven financial services. This methodology adheres to research best standards, since purposive sampling is often used to pick individuals possessing expertise or experience relevant to the study (Etikan et al., 2016).

Purposive sampling was similarly used to choose 15 participants from the management and financial advisory teams of FNBB employees. Employees were selected for their expertise in strategic planning, digital banking operations, and financial advice services, so guaranteeing that the research reflected institutional viewpoints on the integration of robo-advisory services.

In addition to purposive sample, convenience sampling was used to recruit FNBB users via online banking forums and branch locations, where questionnaires were disseminated. This method enabled researchers to include interested volunteers within the designated period, facilitating efficient data gathering despite practical limitations. Convenience sampling is often used in financial re-

search, especially when randomised sampling is unfeasible owing to constraints in participant accessibility (Berndt, 2020).

Although probability sample techniques like stratified random sampling might have enhanced generalisability, the chosen non-probability sampling approaches were better appropriate for this exploratory research. The study aims to discover early adoption trends and hurdles; hence, the use of purposive and convenience sampling successfully gathers significant insights from active digital banking users and financial experts, guaranteeing the results are relevant and practical.

3.3. Ethical Considerations

Ethical compliance was paramount throughout the study procedure, guaranteeing the complete respect of participant rights, data protection, and informed permission. All participants were thoroughly informed about the research aims and their rights before to participation. They were apprised of their right to resign at any point without repercussions, so assuring voluntary participation and maintaining ethical research norms (Creswell & Creswell, 2022).

To ensure anonymity, all survey answers and interview data were anonymised, with no identifying personal information recorded. This method was essential for safeguarding participant privacy, especially considering the sensitive nature of financial information and apprehensions around AI implementation. The research complied with FNBB's data privacy regulations, ensuring that all obtained data was managed in compliance with institutional and international data protection requirements.

Ethical compliance was a central priority, ensuring participant rights, data security, and informed consent were fully respected (Creswell & Creswell, 2022). The research upheld integrity and transparency, ensuring credible and unbiased findings by implementing these ethical safeguards (Bryman, 2016).

4. Results and Discussion

After This section highlights the results from the quantitative survey administered to 30 FNBB customers and the qualitative interviews performed with 15 FNBB staff. The findings are examined to evaluate the viability, adoption obstacles, and strategic factors of robo-advisory services at FNBB. The analysis rigorously assesses these results within the framework of current literature, making comparisons to analogous research in both developing and established financial systems.

4.1. Customer Perceptions of Robo-Advisory Services

4.1.1. Awareness and Understanding of Robo-Advisory Services

The survey findings reveal that client knowledge of robo-advisory services is minimal. Only 27% of respondents indicated previous awareness of AI-driven financial advising models, whilst the majority (73%) had little or no experience with these services. These results correspond with other research indicating that the adoption of financial technology in developing nations is often impeded by insuf-

ficient knowledge and digital literacy (Nguyen et al., 2023).

Customers with varying degrees of awareness mostly acquired knowledge about robo-advisory services from digital banking engagements and financial technology news, however a minimal number had firsthand contact with AI-driven financial planning tools. This indicates that FNBB must execute customer education initiatives to enhance knowledge and illustrate the advantages and security attributes of robo-advisory platforms.

The limited knowledge of robo-advisory services is a substantial obstacle to adoption. Research indicates that customers in developing nations exhibit a delayed adoption of AI-driven financial solutions owing to limited exposure and insufficient digital literacy (Arner et al., 2022). In contrast to South Africa, where hybrid robo-human advice models are in early-stage adoption, Botswana seems to be at a nascent stage of fintech acceptability (Nguyen et al., 2023). Consequently, FNBB must contemplate marketing campaigns that elucidate AI-driven investment methods and inform clients of their benefits.

4.1.2. Willingness to Adopt Robo-Advisory Services

56% of respondents indicated a willingness to use robo-advisory services if included into FNBB's digital banking platform although they had little understanding. Nonetheless, 31% expressed scepticism, highlighting apprehensions around algorithmic decision-making and the absence of human financial counsellors, while 13% were entirely opposed to the concept.

The results indicate that consumer interest in robo-advisors is motivated by accessibility and cost, aligning with worldwide trends in the adoption of AI-driven financial services (Jung et al., 2023). Nonetheless, the lack of confidence in AI-driven decision-making continues to be a significant barrier to implementation (Ringe & Ruof, 2021). Research in Kenya and South Africa indicates that financial customers in developing nations choose hybrid advice models, whereby AI-generated insights are corroborated by human advisers (Arner et al., 2022). This reinforces the notion that FNBB should first use a hybrid approach instead of a completely automated robo-advisory system.

4.2. Employee Perceptions of Robo-Advisory Services

4.2.1. Institutional Readiness and Strategic Viability

Research conducted among FNBB workers indicates a robust internal demand in robo-advisory services; yet, hurdles to implementation persist. A majority (73% of workers) agreed that robo-advisory services are consistent with FNBB's digital transformation plan, highlighting advantages such as cost effectiveness, scalability, and enhanced client engagement potential. Nonetheless, 60% voiced apprehensions over FNBB's capability to provide the requisite technological infrastructure for comprehensive AI-driven investment advice services. Employees recognised that FNBB has effectively executed mobile banking innovations; nonetheless, many interviews underscored that robo-advisory services need more investment in AI, improvements in cybersecurity, and adherence to changing regulatory

standards.

The results align with other studies demonstrating that financial institutions in developing nations often have challenges with AI infrastructure preparedness (Chen et al., 2023). Research from fintech leaders in advanced countries indicates that effective deployment requires a robust AI strategy and substantial IT investment (Ghelani et al., 2022). Consequently, FNBB should first implement robo-advisors on a limited scale, ensuring that its digital infrastructure and security measures are adequately prepared for AI-driven financial decision-making.

4.2.2. Employee Concerns about Customer Trust and Adoption Barriers

A prevalent issue among FNBB personnel was client confidence in AI-based decision-making. 82% of workers contended that consumers would find it challenging to completely trust an AI-driven financial adviser, with a significant 67% asserting that elderly and high-net-worth clients choose human financial advisors.

An FNBB financial strategist observed: “*Numerous clients prioritise interpersonal connections in financial advisory.*” They are used to individualised consultations. Robo-advisors must exhibit dependability and openness to get complete acceptance.

Moreover, 40% of staff saw financial literacy as a significant obstacle, indicating that many FNBB customers lack the requisite expertise to make intelligent AI-driven investment choices. Employees suggested that FNBB implement financial education programs to guarantee customers comprehend the operation of robo-advisory services and the process of making investment choices.

These results correspond with international studies demonstrating that customer trust is a significant obstacle to AI adoption in financial services (Bruckes et al., 2022). Research indicates that explainability in AI-based financial planning substantially affects customer trust (Nguyen et al., 2023). To rectify this, FNBB need to contemplate:

- Incorporating explainability elements into its robo-advisory system, enabling clients to assess investment justifications.
- Offering hybrid financial advice frameworks in which human advisers authenticate AI-generated suggestions.
- Creating educational initiatives to enhance financial literacy, especially for clients unacquainted with AI-based financial instruments.

4.3. Regulatory and Compliance Challenges

65% percent of FNBB workers voiced apprehensions over the absence of AI-specific banking rules in Botswana. Interviewees emphasised that existing banking laws do not clearly include robo-advisory services, resulting in ambiguous compliance.

A compliance officer remarked: “*The regulatory framework for fintech in Botswana is still developing.*” Prior to the adoption of robo-advisors by FNBB, it is essential to confirm adherence to prospective AI governance regulations.

This issue corresponds with larger African fintech studies, indicating that regulatory uncertainty is a significant obstacle to the adoption of AI-driven financial services (Poel & Kudina, 2022). Research indicates that banks need to collaborate with regulators proactively to influence policy dialogues and guarantee compliance (Arner et al., 2022). FNBB need to engage proactively with financial authorities to establish AI compliance guidelines.

4.4. Comparative Analysis: Robo-Advisory Services versus Alternative Fintech Innovations in Banking

The results from FNBB workers and consumers indicate that robo-consulting services had considerable potential to revolutionise financial advisory practices in Botswana. In the expansive fintech sector, several more AI-driven financial technologies have emerged, such as AI-powered chatbots, blockchain-based digital payments, and digital lending platforms. This section analyses the comparison between fintech solutions and robo-advisory services, emphasising their benefits, drawbacks, and overall influence on the banking industry.

4.4.1. AI-Driven Chatbots: Enhancing Customer Service but Lacking Investment Expertise

AI-powered chatbots have emerged as a prevalent digital banking instrument, providing round-the-clock automated client care and immediate financial help. FNBB personnel recognised that chatbots had markedly enhanced operational efficiency, especially in managing routine enquiries, providing transaction support, and issuing fraud detection warnings. Customers expressed significant satisfaction with chatbot-driven services, as 68% of survey participants said that they found FNBB's chatbot beneficial for common banking enquiries.

Nonetheless, chatbots have distinct limits regarding investing consulting services. In contrast to robo-advisors, which use advanced algorithms to assess financial objectives, risk appetite, and market dynamics, AI chatbots are mostly intended for customer support roles. Employees observed that FNBB's chatbot is incapable of delivering personalised financial planning or adaptive investment suggestions, since it functions primarily on rule-based replies instead of predictive analytics.

The research indicates that while AI-powered chatbots improve user engagement and service accessibility, they do not possess the analytical depth necessary for intricate financial advice functions (Jung et al., 2023). Research demonstrates that chatbots are proficient in delivering rapid, uniform replies; yet, clients desiring investment guidance continue to choose human engagement or AI-based analytical instruments (Bruckes et al., 2022). For FNBB, robo-advisory services will enhance chatbots by extending AI functionalities beyond client support, providing tailored wealth management solutions.

4.4.2. Blockchain-Based Digital Payments: Security Advancements without Financial Advisory Functions

Blockchain-based digital payments have emerged as a safe and decentralised al-

ternative to conventional financial transactions. FNBB personnel underlined that digital payment solutions have increased transaction security and fraud protection, with consumers benefitting from speedier cross-border transactions and lower payment processing costs. Seventy-four percent of poll respondents saw blockchain-based transactions as more secure than traditional payment methods. Despite these advantages, blockchain does not immediately effect financial planning or investment advice services. Employees recognised that while digital payments enhance banking security and efficiency, they do not aid consumers in making educated investing choices. In contrast to robo-advisors that use AI-driven data analytics to recommend best investing strategies, blockchain technology mainly emphasises transaction verification and data encryption.

The current study indicates that blockchain technology improves confidence in digital transactions, especially in fraud prevention and decentralised banking (Chen et al., 2023). Nonetheless, the use of blockchain in investment advising services is constrained, since cryptographic security protocols cannot substitute for financial decision-making frameworks (Arner et al., 2022). The study's results affirm that while blockchain is a significant fintech breakthrough, it does not replace AI-driven wealth management solutions. For FNBB, the best fintech approach would entail combining robo-advisory services with safe digital payment technologies, offering a smooth and secured digital banking experience.

4.4.3. Digital Lending Platforms: Expanding Financial Access without Investment Guidance

Another significant fintech advancement in developing nations is digital lending platforms, which use AI-driven credit assessment algorithms to provide alternative finance choices. FNBB personnel acknowledged that digital lending has enhanced financial inclusion, especially for small company owners and underprivileged customers who may otherwise have difficulties in securing conventional loans. Among questioned clients, 62% indicated interest in digital financing, citing shorter approval periods and more accessibility compared to traditional bank loans.

Digital lending platforms mainly emphasise loan availability rather than investment strategy. In contrast to robo-advisory services that assist clients in optimising savings, allocating assets, and strategising long-term investments, digital lenders evaluate creditworthiness and provide customised loan packages. Employees highlighted that while AI-driven credit scoring is very efficient for risk assessment, it lacks predictive financial insights customised for personal wealth management.

The research indicates that digital lending platforms have transformed loan accessibility, especially in developing nations where financial exclusion persists (Nguyen et al., 2023). Research demonstrates that AI-based credit models have enhanced loan accessibility and diminished default rates; yet, they do not provide the same financial advice function as robo-advisors (Bruckes et al., 2022). The results indicate that FNBB may use robo-advisory technology as an adjunct to digital

lending, assisting consumers in both obtaining loans and managing their money prudently after loan approval.

4.5. Synopsis of Comparative Analysis

The findings as seen in **Table 1** suggest that while AI-driven chatbots, blockchain-enabled payments, and digital lending platforms provide unique advantages, they do not replace the roles of robo-advisory services. FNBB workers and clients acknowledge that robo-advisors provide distinct benefits in financial decision-making, especially in investment optimisation and long-term wealth management.

Table 1. Comparative analysis of fintech innovations.

Fintech Innovation	Primary Benefit	Limitations Compared to Robo-Advisory Services
AI-Powered Chatbots	Improves customer service efficiency	Lacks personalized investment analysis
Blockchain-Based Digital Payments	Enhances transaction security	Does not provide financial planning insights
Digital Lending Platforms	Expands credit access through AI-driven models	Focuses on loans rather than investment guidance

4.6. Strategic Implications for Financial Institutions

Considering the comparative benefits and limits of various fintech solutions, financial institutions should implement a comprehensive digital transformation plan that incorporates robo-advisory services in conjunction with current fintech advances. Based on the study's conclusions, financial institutions should consider:

- 1) Integrating AI-Enhanced Chatbots with Robo-Advisory Services
 - Chatbots ought to manage fundamental banking enquiries, whilst robo-advisors should provide more profound investing insights.
 - FNBB may use chatbot-assisted financial education tools to familiarise consumers with AI-driven financial planning principles.
- 2) Incorporating Robo-Advisors with Blockchain Security Protocols
 - Robo-advisors must use blockchain encryption to guarantee data security and safeguard against fraud in financial planning.
 - This would bolster client trust in AI-driven investing services by guaranteeing data accuracy.
- 3) Integrating Robo-Advisory Services with Digital Lending Platforms
 - Financial institutions might include robo-advisory capabilities into loan management systems, assisting borrowers in formulating post-loan financial strategies.
 - AI-driven financial advisers may recommend investment plans for borrowers, optimising financial development after loan availability.

Financial institutions can optimize the advantages of digital banking technolo-

gies, securing a competitive edge in Botswana's dynamic financial environment by implementing a cohesive fintech strategy.

The results indicate that while several fintech technologies enhance banking efficiency, robo-advisory services provide unique benefits in financial planning and investment optimisation. FNBB workers acknowledge that chatbots enhance customer service, blockchain fortifies transaction security, and digital lending promotes financial inclusion; yet none of these technologies serve the same function as robo-advisors in assisting consumers with wealth management choices.

Financial institutions must portray robo-advisory services as a complementing option rather than a substitute for current fintech advances to ensure effective implementation. A phased deployment approach using AI-powered chatbots for fundamental financial education, blockchain for safe investment transactions, and digital lending integration for financial growth planning will guarantee sustained uptake and client confidence in AI-driven financial services.

5. Conclusions and Strategic Recommendations

5.1. Summary of Findings

The research indicates that robo-advisory services may substantially improve financial institutions' competitiveness by providing economical, AI-based financial guidance. In contrast to conventional human advising models, AI-driven financial planning offers scalable, tailored investment suggestions, enhancing the accessibility and affordability of wealth management for financial institutions' clientele. Nonetheless, despite these benefits, issues about algorithmic bias, customer trust, and regulatory ambiguity must be resolved before achieving broad implementation.

A primary obstacle to adoption is the absence of confidence in AI-facilitated financial decision-making. Clients express scepticism over the complete reliance on algorithms for investing advice, apprehensive that robo-advisors may lack human discernment, emotional acuity, and individualised attention. Furthermore, algorithmic bias poses a significant issue, since AI models developed on biased datasets may inadvertently prioritise certain consumer categories, resulting in uneven investment possibilities (Ringe & Ruof, 2021; Nguyen et al., 2023). Resolving this problem requires AI fairness audits and ongoing scrutiny of robo-advisory algorithms to guarantee that financial suggestions remain impartial, inclusive, and transparent.

The research underscores regulatory ambiguity as a significant obstacle. The financial regulatory framework of Botswana does not specifically address AI-driven financial advising services, resulting in legal uncertainties for banks contemplating the use of robo-advisory systems. FNBB staff articulated apprehensions that the absence of explicit standards may impede AI implementation due to compliance issues. This conclusion aligns with international fintech studies, indicating that banks must actively engage with financial authorities to guarantee AI services comply with evolving governance regulations (Arner et al., 2022).

Moreover, client education has become a pivotal element affecting the acceptance of robo-advisory services. A significant number of assessed FNBB clients exhibited insufficient knowledge and comprehension of AI-driven investing services, resulting in their reluctance to accept automated financial suggestions. The research emphasises the need for specialised financial literacy initiatives to address the knowledge disparity and enhance customer trust in AI-based financial planning instruments. These initiatives should concentrate on informing clients about the advantages of robo-advisory services, techniques for risk reduction, and measures for data protection to promote increased acceptance and adoption.

5.2. Strategic Recommendations

To effectively integrate robo-advisory services while tackling significant hurdles, financial institutions that adopt robo-advisory must use a multifaceted strategic approach. The subsequent proposals aim to augment client uptake, fortify regulatory compliance, and boost cybersecurity measures.

5.2.1. Client Education Initiatives

The study's results highlight the need for financial literacy initiatives to enhance awareness and comprehension of robo-advisory services. A significant number of clients are unacquainted with AI-driven financial planning, resulting in reluctance and doubt. Banks need to create focused teaching initiatives using digital material, interactive tutorials, and face-to-face financial seminars to elucidate robo-advisors and emphasise their advantages, security protocols, and transparency attributes.

These activities must be included into the banks's digital banking systems, guaranteeing that clients may access educational materials in real time while using online banking and investing services. Studies indicate that consumer education significantly impacts fintech acceptance, as knowledgeable customers are more inclined to use AI-driven financial technologies (Nguyen et al., 2023). Banks may enhance customer trust and enable a more seamless transition to AI-driven financial advising services by emphasising educational initiatives.

5.2.2. Adoption of Hybrid Models

Considering prevalent trust issues among FNBB customers, the research advocates for the implementation of a hybrid advising model, integrating AI-driven robo-advisory services with human financial advisors. This strategy mitigates consumer hesitance by guaranteeing the availability of human knowledge for intricate financial choices, while using AI for standard investment suggestions and portfolio management.

Hybrid models have been effectively used in several markets, notably in South Africa, where wealth management businesses have integrated AI-driven insights with human supervision to bolster consumer confidence (Arner et al., 2022). Banks may use a similar technique, guaranteeing that clients who favour conventional advisory services may continue engage with human advisers, while those at

ease with AI-driven models can entirely leverage robo-advisory tools.

This incremental transition method will assist banks in establishing trust in AI-driven financial planning, illustrating how automation augments rather than supplants human competence. As client trust increases, banks may enhance automation while preserving optional human interaction for high-net-worth and cautious investors.

5.2.3. Collaborative Regulation

Due to the absence of definitive AI governance frameworks in Botswana's financial industry, banks must actively collaborate with regulators to influence policy debates and guarantee adherence to evolving regulatory norms. The survey underscores FNBB workers' resistance about compliance risks and data privacy ambiguities, indicating that proactive collaboration with financial regulators is essential.

Banks must collaborate with the Bank of Botswana and other financial authorities to establish explicit standards for robo-advisory services, focussing on critical problems such as algorithmic responsibility, consumer protection, and financial data security. Studies indicate that banks actively participating in fintech regulatory dialogues are more inclined to sway policy results to their advantage (Poel & Kudina, 2022).

Financial institutions should ensure that their robo-advisory services comply with regulatory standards by promoting AI governance frameworks, therefore mitigating legal risks and facilitating adoption. Moreover, engaging with regulators will enhance consumer trust, since clients are more inclined to use AI-driven financial instruments when they are regulated by explicit, transparent guidelines.

5.2.4. Enhancements in Cybersecurity

The report emphasises cybersecurity as a crucial factor due to the reliance of robo-advisory services on extensive amounts of sensitive consumer data. FNBB staff articulated apprehensions over the susceptibility of AI-driven financial systems to hacks, fraud, and unauthorised data access. Customers identified data security threats as a significant obstacle to adoption, highlighting the need for robust protection measures.

Financial institutions should invest in advanced encryption technology, artificial intelligence-driven fraud detection systems, and multi-factor authentication processes to mitigate these threats. Implementing real-time AI-driven cybersecurity measures will enable banks to monitor suspicious activity, block unauthorised transactions, and protect consumer financial data (Chen et al., 2023).

Furthermore, banks need to synchronise their cybersecurity approach with worldwide best practices, including the General Data Protection Regulation (GDPR) and other foreign data protection frameworks. Adhering to international security standards would safeguard client assets and enhance confidence in AI-driven financial services, hence increasing user willingness to utilise robo-advisory platforms.

5.3. Conclusion

The research highlights the revolutionary potential of robo-advisory services for banks, offering economical, scalable, and data-informed investing solutions. To ensure effective adoption, banks must tackle critical difficulties with consumer trust, regulatory compliance, and cybersecurity threats.

The suggestions provide a systematic framework for execution. Financial institutions need to prioritise consumer education initiatives to improve financial literacy and knowledge of AI-driven advising services. Moreover, using a hybrid approach will assist banks in facilitating the shift by integrating AI-driven investing insights with human financial acumen. To address regulatory and cybersecurity issues, banks should engage with financial authorities and invest in sophisticated data protection strategies. Banks can establish themselves as a fintech leader in Botswana, enhancing financial inclusion, augmenting client engagement, and fortifying their competitive stance in the banking sector by executing these objectives.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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