ANALYSING THE EFFECT OF FINANCIAL TECHNOLOGY ON FINANCIAL BEHAVIOUR IN NAMIBIA: A GENDER PERSPECTIVE

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ABSTRACT

Despite advancements in Financial Technology (fintech), there is a notable reluctance among individuals, including those in Namibia, to adopt internet banking services. The main objective of this study is to investigate the effect of fintech on financial behaviour in Namibia, specifically the study aims to (1) examine gender disparities in the adoption of mobile money services (fintech) in Namibia overall and by gender and (2) evaluate the effect of fintech adoption on saving and borrowing behaviours overall and by gender. To achieve these objectives, the study employs the 2021 Global Findex Data for Namibia, the probit model to analyse the determinants of fintech adoption and a control function approach to assess the effect of fintech adoption on saving and borrowing behaviours. The findings indicate no significant gender disparities in fintech adoption in Namibia. Furthermore, results reveal that fintech adoption has a significant positive effect on both borrowing and saving behaviours. Findings equally indicate that effect of fintech is stronger on saving compared to borrowing. These results highlight fintech's potential to enhance financial inclusion and improve financial behaviour in Namibia. Policymakers may consider initiatives to promote fintech adoption and utilisation, particularly among underserved populations.

Keywords: Fintech adoption, gender, savings, borrowing, Namibia

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DECLARATION

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LIST OF ABBREVIATIONS AND ACRONYMS

ATMs	Automated Teller Machines
BoN	Bank of Namibia
FinTech	Financial Technology
GDP	Gross Domestic Product
IMF	International Monetary Fund
MFS	Mobile Financial Services
NBFI	Non-Banking Financial Institutions
PIN	Personal Identification Number
SMS	Short Messaging Service

CHAPTER ONE: INTRODUCTION

1.1 Introduction

The rapid advancement of Financial Technology (fintech) has transformed the global financial landscape, reshaping how individuals and businesses interact with financial services. Innovations such as mobile banking, digital payments, blockchain, and robo-advisors have enhanced accessibility, efficiency, and financial inclusion. This study examines how fintech influences financial behaviour in Namibia, with a specific focus on gender dynamics. This chapter outlines the study's background, problem statement, research objectives, significance, and scope.

1.2 Orientation of the Study

In regions with limited financial inclusion, individuals and households in developing countries often resort to informal saving methods. These include storing money in unsecured locations, investing in valuable assets such as jewellery or livestock, and participating in informal savings groups like merry-go-rounds, where members contribute funds in a rotating system (Steinert et al., 2018). However, Financial Technology (fintech) has significantly transformed the financial landscape, providing alternative solutions that enhance access, security, and efficiency in financial transactions. By leveraging digital financial services, individuals can reduce their reliance on informal mechanisms, thereby minimizing risks associated with theft, loss, and asset depreciation. Additionally, fintech solutions enable seamless transactions that foster greater economic participation and financial security.

Namibia, like many other Sub-Saharan African nations, faces challenges in financial inclusion. According to the Namibian Ministry of Finance and Public Enterprises, the

2017 FinScope survey found that while mobile money penetration stood at 76%, only 29% of individuals aged 15 and above actively used the service. Additionally, despite the availability of online banking services provided by all commercial banks in Namibia, adoption remains relatively low (Amukeshe, 2021). Factors influencing the reluctance to use fintech solutions, including mobile money and internet banking, remain underexplored, creating a gap in understanding customer behaviour in Namibia's financial sector. Understanding the barriers to fintech adoption—such as digital literacy, trust issues, regulatory constraints, and accessibility—can provide valuable insights into how financial institutions and policymakers can design strategies to improve usage and integration.

Beyond mobile money, Namibia has seen an expansion in various fintech services, such as online banking platforms, digital credit facilities, and electronic wallets like Standard Bank Namibia's BlueVoucher, Nedbank's MobiMoney Wallet, and Bank Windhoek's EasyWallet. These platforms enable users to conduct a range of financial activities, including deposits, withdrawals, transfers, and payments through secure digital channels. However, while these services have the potential to enhance financial inclusion, there is limited research on how they influence financial behaviour, particularly across different demographic groups. The extent to which different income levels, educational backgrounds, and geographic locations affect fintech adoption remains an area requiring further investigation to tailor financial services to diverse user needs.

Existing studies on fintech adoption in Africa have highlighted its role in improving financial access, increasing household savings, reducing transaction costs, and expanding access to credit (Jack & Suri, 2014; Suri & Jack, 2016). At a macroeconomic level, the

integration of fintech services has been linked to job creation, poverty reduction, and economic growth (Jack et al., 2013). However, Namibia-specific evidence remains scarce, particularly regarding gender disparities in fintech adoption and usage. Given the observed global trends and the country's evolving financial landscape, it is crucial to analyse how fintech influences financial behaviour in Namibia. This study aims to bridge this knowledge gap by examining the role of financial technology in shaping financial behaviour, with a specific focus on gender dynamics. By exploring gender-based differences in fintech adoption, the study seeks to uncover potential inequalities and suggest targeted policy interventions to promote inclusive financial growth.

Furthermore, the role of government policies and regulatory frameworks in shaping fintech adoption and usage in Namibia remains underexplored. While some regulatory measures have been introduced to facilitate digital financial services, such as consumer protection laws and digital banking guidelines, challenges related to cybersecurity, fraud prevention, and interoperability persist. Addressing these regulatory concerns is essential in fostering trust and encouraging widespread adoption of fintech solutions. Policymakers must work closely with fintech companies, financial institutions, and consumer advocacy groups to ensure a secure, transparent, and efficient digital financial ecosystem.

Lastly, digital financial literacy is crucial in fintech adoption and usage, particularly among rural and marginalised communities. Many individuals lack awareness of available digital financial services or the skills required to navigate them effectively. Educational initiatives aimed at increasing digital and financial literacy can significantly enhance fintech uptake and enable individuals to make informed financial decisions. By integrating fintech education into community programs, schools, and vocational training centres,

Namibia can create a more financially inclusive society that leverages technology to drive economic empowerment and sustainable development.

1.3 Statement of the Problem

Limited access to formal financial institutions has led many individuals in developing nations to rely on informal savings mechanisms that are often unsafe, inefficient, and unreliable (Adan, 2016; Batista & Vicente, 2017). These informal methods expose individuals to risks such as theft or loss due to unforeseen circumstances, and they also increase the likelihood of spending on non-essential or "temptation" goods (Ky, Rugemintwari, & Sauviat, 2017). The rapid advancement of Financial Technology (FINTECH) has significantly influenced financial service accessibility, particularly through mobile money, which enables users to save and borrow with ease (Cook & McKay, 2015). Mobile money applications offer secure, convenient, and efficient financial management by providing instant access to savings and reducing risks associated with informal saving methods (Prina, 2015). Additionally, mobile money adoption has been linked to increased savings, expenditure, formal banking usage, and economic decision-making within households (Suri & Jack, 2016). However, despite these advantages, there remains a significant research gap regarding the factors influencing the intention to adopt and actual usage of online banking, particularly in developing nations. Namibia, as a developing country, faces similar challenges. While all commercial banks in Namibia provide online banking services, a considerable number of citizens remain hesitant to embrace these platforms. Due to the scarcity of research on online banking adoption in developing countries, Namibian banks lack comprehensive insights into the factors driving their customers' digital banking preferences (Amukeshe, 2021).

Gender disparities have been recognised as crucial in discussions on financial access and inclusion. Women, in particular, constitute a substantial proportion of the unbanked population, emphasizing the need to address gender-specific barriers to financial services (Demirgüc-Kunt et al., 2018; Wanjala, 2014). Understanding these disparities is essential, as financially disadvantaged women are expected to leverage savings and credit access to enhance their entrepreneurial success and economic empowerment. Emerging financial technologies, such as mobile money services, have provided new opportunities for previously unbanked populations, particularly women, to access savings, credit, and other essential financial services (Adaba & Ayoung, 2017).

Given the above, investigating the influence of FINTECH on financial behaviour, with a particular emphasis on gender, can provide valuable insights into financial inclusion and gender equality debates. While empirical evidence suggests that mobile money usage enhances savings and borrowing behaviours, this remains an underexplored area in Namibia. This study aims to bridge this research gap by analysing the complex relationships between mobile money adoption and financial behaviour, with gender as a focal variable. The findings are expected to contribute to more informed policy discussions and decision-making processes concerning financial inclusion and gender equity in Namibia.

1.4 Research Objectives

The main objective of the study is to investigate the impact of Fintech on financial behaviour in Namibia overall and by gender. The corresponding specific objectives of the study are:

- To examine if there exist gender disparities in the propensity of adopting mobile money services (Fintech) in Namibia.
- To evaluate the effect of Fintech adoption on the probability of borrowing overall and by gender in Namibia.
- To investigate the effect of Fintech adoption on the probability of saving overall and by gender in Namibia

1.5 Hypotheses

Hypothesis 1:

- **Null Hypothesis (H0):** There is no significant difference in the probability to adopt fintech services between women and men.
- **Alternative Hypothesis (H1):** Women have a higher probability to adopt fintech services compared to men.

Hypothesis 2:

Null Hypothesis (H0): Fintech adoption has no significant effect on borrowing behaviour in Namibia.

Alternative Hypothesis (H1): Fintech adoption has a positive and significant effect on borrowing behaviour in Namibia, with the impact being stronger among women than men.

Hypothesis 3:

Null Hypothesis (H0): Fintech adoption has no significant effect on saving behaviour in Namibia.

Alternative Hypothesis (H1): Fintech adoption has a positive and significant effect on saving behaviour in Namibia, with the effect being stronger among women than men.

1.6 Significance of the Study

The study's results are anticipated to contribute to the development of enhanced financial services. Consequently, Fintech facilitates the emergence of specialist financial institutions, such as banks, that offer customised goods and services aligned with consumer preferences. The research findings might potentially provide valuable insights for the Namibian government and authorities, such as the Central Bank, in developing policies aimed at enhancing the efficiency and service quality of financial sector participants, including banks and other financial institutions. Furthermore, this investigation holds significance for policymakers who are contemplating measures to enhance the well-being of individuals using financial inclusion. It also serves as a valuable point of reference and literature review resource for forthcoming academic investigations in this area.

1.7 Limitations of the Study

The statistical model (Probit regression model) relies on assumptions (e.g., normality, homogeneity of variance), however, if these assumptions are violated, this can lead to inaccurate results, hence this is a limitation to the study. This was overcome using validated and reliable measurement tools. Overfitting or Underfitting can be a limitation of this study. Overfitting occurs when a model is too complex and captures noise rather than the underlying pattern, while underfitting occurs when a model is too simple to capture the complexity of the data. Another limitation of this research is the reliance on the 2021 survey as the most recent available data. While efforts have been made to justify its continued relevance in 2025, the rapidly evolving nature of financial technology and potential shifts in economic conditions may introduce factors that were not captured in the

dataset. Consequently, the findings have been interpreted with caution, acknowledging that newer developments in financial inclusion and technological adoption may not be fully reflected.

1.8 Delimitations of the Study

The scope of the study is to examine the impact of Fintech on financial behaviour in Namibia only and no investigation has been extended to other countries outside Namibia.

1.9 Outline of the Study

The present dissertation has five primary Chapters. The introductory Chapter provides a comprehensive summary of the whole dissertation, followed by Chapter two, which is dedicated to the theoretical and empirical literature and framework of the study. The third Chapter provides a comprehensive description of the data and model definition. It covers several aspects such as the dataset, variables, estimation technique, and model specification. In the next Chapter four, the primary findings of the study and the deductions made from these findings in connection to the pre-existing theoretical frameworks are described in the results and discussion. The concluding Chapter five provides a concise overview of the study, highlighting its contribution to the field and identifying potential avenues for future research based on the findings and observed gaps.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

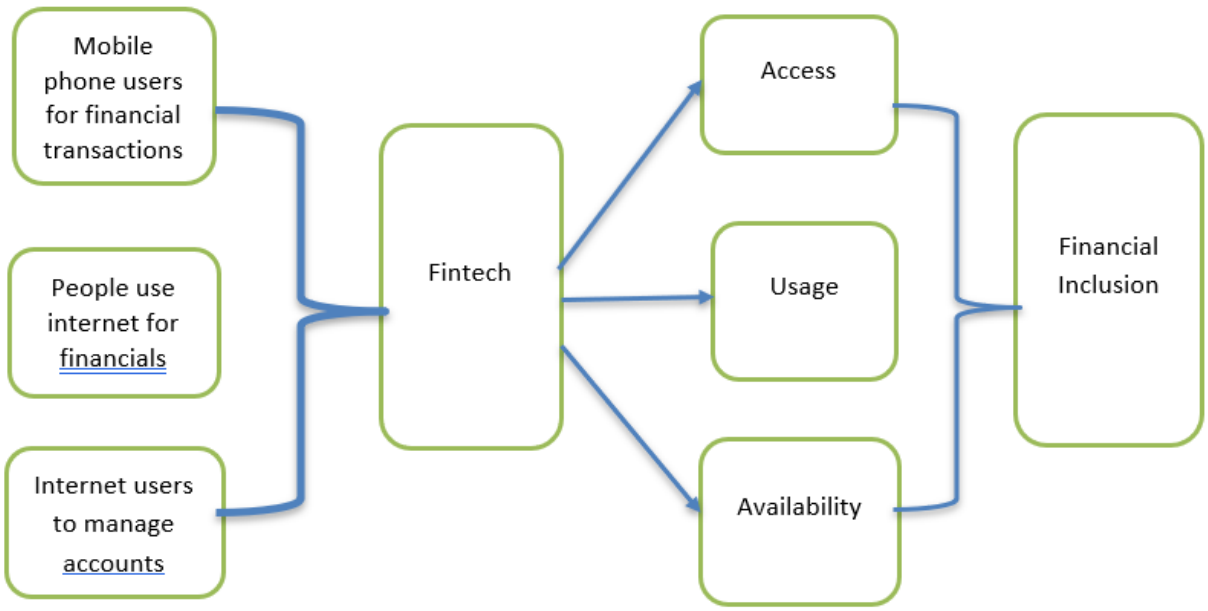
This Chapter provides a comprehensive literature analysis on the impact of Fintech on financial conduct within the context of Namibia. This Chapter provides a comprehensive review of existing literature on the impact of Fintech on financial behaviour in Namibia, specifically focusing on the impact of mobile money on individual savings and borrowing patterns. The primary objective is to situate this research within the broader literature context, to gain a deeper understanding of the research problem and to identify any existing gaps in the current body of research.

2.2 Conceptual Framework

According to Xiao (2018), financial behaviour refers to the entirety of human actions related to the management of monetary resources. Saurabh and Nandan (2018) define financial behaviour as the manner in which individuals handle their income and overall financial situation, including their attitudes and behaviours towards regular financial matters. Financial behaviour encompasses the ability of individuals to proficiently administer their financial assets to attain success in diverse domains of life. According to Andrianaivo and Kpodar (2012), as cited in Pradhan & Sahoo (2021), Fintech through mobile phones enhances financial behaviour through three main channels, namely, the attitude of consumers, the age, and gender of consumers. Initially, the utilisation of FinTech platforms like mobile money facilitates the accessibility of consumer's financial and credit histories, which were previously challenging to compile, Hence enabling credit providers and financial institutions to evaluate credit profiles with ease. Secondly,

FinTech significantly aids in the gathering of data on the credit behaviour of consumers to mitigate the information asymmetry problem in the form of adverse selection by financial institutions. Finally, the utilisation of technology in financial services enhances the execution of financial transactions, including payments for goods and services.

Figure 2. 1: Financial Technology and Financial Behaviour



Source: World Bank

2.3 Gender Disparities in Fintech Adoption

Fintech adoption is often seen as a key enabler of financial inclusion, yet gender disparities remain a significant challenge. Globally, women tend to face more barriers to adopting Fintech compared to men. These barriers include limited access to digital devices, lower levels of financial literacy, and socio-cultural constraints (Gine & Mansuri, 2022). Studies in other African countries, such as Kenya and South Africa, have found that women are

less likely to adopt mobile money services, often due to a lack of trust in digital platforms or concerns about security and privacy (Munyegera & Matsumoto, 2020).

In Namibia, however, the gender gap in Fintech adoption has been less well documented. While mobile money services like M-Pesa and e-wallets have become increasingly popular, little research has been conducted to explore the gendered barriers to Fintech adoption specifically in Namibia. According to a report by the Bank of Namibia (2023), mobile money services are widely used in urban areas, but rural women face greater challenges in adopting these services, including low literacy rates and lack of infrastructure. It is likely that these gender-specific barriers influence the overall adoption rates, with women being underrepresented in the digital financial space.

Financial technology (FinTech) has emerged as a transformative force within the financial sector, especially in enhancing financial inclusion. Financial inclusion refers to the access to and use of formal financial services by individuals, particularly those who are traditionally underserved by the conventional banking system. The advent of FinTech has provided opportunities for expanding access to financial services, especially for underserved populations, such as women, rural dwellers, and the low-income demographic. However, while there has been a surge in the deployment of FinTech solutions, the effectiveness and impacts of these technologies on financial inclusion, particularly in the context of gender disparities, are still areas of ongoing debate.

A key challenge in the literature is the under-exploration of methodological or data deficiencies in studies on FinTech's role in financial inclusion. Several works, such as those by Ozili (2021) and Munyegera & Matsumoto (2020), offer valuable insights into

the relationship between FinTech and financial inclusion. However, there remains a notable absence of longitudinal studies that track the impacts of FinTech on financial inclusion over extended periods. Additionally, while many studies rely on survey data or cross-sectional analysis, these approaches fail to capture the dynamic nature of FinTech adoption, particularly in regions with rapidly evolving technological ecosystems. The lack of comprehensive data, especially from rural or marginalised areas, raises questions about the generalizability of findings. As such, more nuanced and context-specific studies are necessary to provide a deeper understanding of how FinTech interacts with financial inclusion, especially concerning gender.

Regarding gender disparities in financial inclusion, some works have identified how FinTech can reduce the gender gap by enabling women to access financial services more easily. For example, Dinesh & Sen (2022) argue that mobile banking and digital wallets have facilitated easier access to credit, savings, and insurance products for women, thereby helping close the gender gap in financial inclusion. However, there is a critical need to explore the deeper behavioral and cultural foundations that influence this gap. Gendered cultural norms often dictate financial behaviors, and women's lower participation in formal financial systems can be attributed to a combination of financial literacy gaps, social biases, and restricted access to mobile phones or the internet in some societies. Studies by Burgess & Pande (2020) have suggested that while FinTech has the potential to close this gap, it has not been enough to overcome entrenched societal barriers that women face in many regions.

Moreover, some scholars have pointed out that the digital divide exacerbates gender disparities in FinTech adoption. For instance, Alhassan & Odusanya (2021) highlight that

in some low-income settings, women are less likely to own mobile phones or have access to internet services, which limits their ability to benefit from mobile money and digital banking platforms. This observation suggests that the financial inclusion benefits attributed to FinTech may be unevenly distributed along gender lines. Therefore, there is a need for a more in-depth analysis of the social and infrastructural barriers that inhibit women's full participation in the FinTech revolution.

In addition to gender disparities, another key issue that requires more critical attention is the impact of FinTech on financial literacy and consumer behaviour. Studies like Kikulwe et al. (2021) have shown that while FinTech tools are available, the level of understanding and effective use of these tools remains low among both men and women in some developing regions. This lack of financial literacy can exacerbate existing inequalities, as individuals may not fully understand the benefits or risks associated with digital financial products. A deeper exploration of the relationship between financial literacy, FinTech adoption, and financial outcomes could provide valuable insights into how FinTech can be better tailored to meet the needs of different demographic groups.

2.4 Theoretical Perspective

2.4.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (Davis, 1989) provides a useful framework for understanding Fintech adoption. According to TAM, perceived ease of use and perceived usefulness are the main factors that determine an individual's decision to adopt technology. In the context of gender, studies have shown that women tend to place greater emphasis on trust and security when adopting digital financial technologies (Venkatesh & Bala, 2020). Thus, the TAM framework can help explain why women may exhibit lower

levels of Fintech adoption compared to men, particularly in environments where digital financial systems are still relatively new and untested.

Financial technology has the potential to influence borrowing behaviours by providing easier access to credit, reducing transaction costs, and expanding financial services to underserved populations. However, the impact of Fintech on borrowing behaviours can vary by gender. Women, particularly in low- and middle-income countries, often face challenges in accessing traditional financial services, such as loans or credit, due to systemic gender biases and discriminatory practices (Hunt & Samman, 2020). Fintech platforms, which often rely on alternative credit scoring models and data from mobile phones, may offer women more equitable access to financial services.

In Namibia, the introduction of mobile money services and digital lending platforms may offer women greater opportunities for borrowing. For example, women who are excluded from formal financial systems due to lack of collateral or limited credit history may benefit from Fintech's alternative lending criteria (Zhu & Kim, 2021). However, it is important to consider the gender-specific barriers to borrowing that may still exist, such as socio-cultural norms around women's financial independence and control over financial decision-making.

2.4.2 Social Capital Theory

Social Capital Theory (Bourdieu, 1986) can help explain how gender-based differences in borrowing behaviours emerge in Fintech adoption. Social capital refers to the networks and relationships that individuals have within their communities. Women often face social and cultural limitations that restrict their access to these networks, which can hinder their

ability to borrow money. The incorporation of Fintech into borrowing practices, however, has the potential to bypass traditional social networks, allowing women to access credit more freely. This shift could significantly influence borrowing behaviours, especially if Fintech platforms offer more flexible and inclusive lending practices.

Saving behaviour is another financial aspect that can be influenced by Fintech adoption. Mobile money services and digital savings platforms have made saving more accessible to those who may not have access to traditional banking services. However, gender differences in saving behaviour may arise due to cultural and economic factors that influence men's and women's financial decision-making processes. Globally, women tend to save more than men, often driven by a desire for financial security for themselves and their families (Fisher & Alston, 2021). In Namibia, Fintech adoption may provide women with more opportunities to save, particularly in the face of economic instability or crises. However, research suggests that women may face more barriers in using digital platforms to save due to lower financial literacy or lack of trust in digital systems (Gine & Mansuri, 2022).

2.4.3 Planned Behaviour Theory

The Theory of Planned Behaviour (Ajzen, 1991) is particularly useful in understanding the saving behaviours influenced by Fintech adoption. This theory posits that an individual's intention to engage in a behaviour (such as saving money) is influenced by their attitudes, subjective norms, and perceived behavioural control. In Namibia, gender differences in financial attitudes and control over household finances may influence how men and women perceive the benefits of Fintech for saving. For instance, if women perceive mobile savings platforms as secure and beneficial, they may be more likely to use them. However, if societal norms discourage women from managing their own finances, this could limit their participation in digital saving behaviours.

2.5 Linkage between Financial Technology and Financial Behaviour

Preliminary findings indicate that the utilisation of Financial Technology (FinTech) is linked to enhanced budget management, loan repayment, and savings practices, as well as heightened credit accessibility. The presence of efficient and dependable financial systems plays a crucial role in promoting financial inclusion, reducing poverty, and fostering economic progress in emerging nations (Suri & Jack, 2016). FinTech, an abbreviation for Financial Technology, represents the rapidly expanding sector of start-ups in the global market. This innovation envisions alternative methods of delivering financial services and revolutionises how consumers engage with and perceive such services. The advent of new technologies has facilitated the utilisation of financial services by consumers through the convenience of mobile devices. Consequently, there has been a decrease in the frequency of interactions with commercial providers, as consumers are no longer obliged to visit physical banks or other financial institutions (Manyika et al., 2016). Mobile applications can monitor individuals' economic participation, enabling customers to conveniently track

and assess their financial behaviour and overall welfare using their smartphones. According to Manyika et al. (2016), these applications employ data and give users with valuable insights and solutions for managing their finances, including budgeting and bill payment. These functionalities largely encompass the services typically offered by a financial advisor.

The advent of FinTech products has exerted a significant impact on various domains within the financial services industry. According to Hove and Dubus (2019), the domains of finance that experience the greatest influence include savings, personal finance, investment and wealth management, lending, mortgages, payments, and insurance. The industry has also witnessed the efficacy of mobile wallets, peer-to-peer payments, and foreign exchange and remittance services. According to Manyika et al. (2016), mobile applications that facilitate person-to-person transactions for both consumers and businesses have gained significant popularity among users. The payments industry is currently undergoing a significant period of rapid transformation. The utilisation of these applications for money transfer offers significant time and effort savings to consumers. Individuals are now relieved of the obligation to issue cheques or visit automated teller machines (ATMs) to retrieve funds owed to acquaintances or commercial entities. The proliferation of FinTech choices is an ongoing trend, with increasing adoption rates. Several upcoming services in the financial sector encompass Real-time Payments, Digital Currency, Invoice Trading, and Community Shares (Hove & Dubus, 2019). What is the global response to the recent changes and innovations in the banking sector?

According to research conducted by the World Bank in 2014, there is evidence to suggest that individuals, particularly those who are younger, technologically adept, and possess

greater incomes, are rapidly adopting new financial technology. A significant proportion, specifically 45 per cent, of clients residing in the United States engage with a minimum of one financial technology service. According to the World Bank (2014), the most often utilised financial technology (FinTech) services by consumers are money transfers and payment tools, with savings and investment services following closely behind. The convenience and efficiency of FinTech solutions have garnered increased consumer interest, leading to rapid adoption.

Nonetheless, elevated transaction costs provide a significant obstacle to the efficiency of financial markets in these nations (Suri, 2015). Statistics indicate that over two billion individuals have restricted access to formal financial services, predominantly residing in developing nations characterised by low financial inclusion (World Bank, 2014). In this context, formal financial institutions refer to entities such as microfinance organisations and banks that are authorised and overseen by the government to conduct monetary and financial activities, including deposits, investments, savings, currency exchange, and loans.

Empirical research indicates that financial inclusion, as a significant catalyst for economic growth, might elevate the Gross Domestic Product (GDP) of emerging nations by 6% by 2025 (Manyika et al., 2016). Moreover, enhancing financial inclusion is deemed essential for achieving the Sustainable Development Goals, including poverty alleviation and the promotion of equality (United Nations, 2015). Subsequent research indicates that mobile money has significantly enhanced financial access and inclusion for vulnerable sociodemographic groups, including the impoverished and rural inhabitants, who previously experienced limited financial inclusion (Ouma et al., 2017).

2.6 The Financial Sector of Namibia

The financial system is robust, well-managed, and capable of withstanding credible macroeconomic shocks. Financial services industry has reached its maturity and is tremendously lucrative and well-capitalized. Additionally, the Non-Banking Financial Institutions (NBFI) sector has reached a high level of development. Exposure to the real estate industry (for banks) and financial markets both contribute to some of the macro risks that an organisation faces. Financially speaking, Namibia is considered to have one of the most advanced and well-developed systems in all of Africa. This includes a total of eight commercial banks, around thirty insurance firms, many pension funds, asset management businesses, and unit trust management companies, in addition to a few specialised lending institutions and microfinance organisations. Every one of the banks has substantial ties to South Africa, with three of them even having South African ownership of many of their shares. It would appear that each of the institutions has sufficient capital, is profitable, and is managed effectively.

Financial inclusion in Namibia refers to the access and usage of financial services by the broader population, especially marginalised groups. The Namibian government and various stakeholders have implemented policies and initiatives aimed at improving financial access. National Financial Inclusion Strategy: Namibia has developed a National Financial Inclusion Strategy (NFIS) to enhance access to financial services. According to the Bank of Namibia (2019), the NFIS outlines several strategic pillars, including expanding digital financial services and improving financial literacy. The regulatory framework includes oversight by the Bank of Namibia, which has introduced policies to enhance financial sector stability and consumer protection. Research indicates that while

urban areas have relatively high banking penetration, rural and low-income areas often face significant barriers. According to a study by Shigwedha and Mungunda (2021), the majority of Namibians still rely on informal financial services due to limited access to formal banking infrastructure. The growth of mobile banking and fintech solutions has been a significant factor in improving financial inclusion. Research by Naik and Venter (2020) highlights that mobile money services have expanded access, particularly for rural populations.

However, growth of financial services brings some benefits to the country but at the same time some challenges and barriers. One of the major challenges identified is the lack of financial infrastructure in remote areas. A report by the Financial Sector Deepening (FSD) Namibia (2022) points out that limited physical bank branches and ATMs in rural areas hinder access. Another significant barrier is low financial literacy. According to a study by Becker and Ndeed (2019), enhancing financial education is crucial for improving financial inclusion.

Several studies, including those by Othieno and Heine (2021), have found that increased financial inclusion contributes to economic growth and poverty reduction. The expansion of financial services has been linked to improved economic stability and entrepreneurial activity. Financial inclusion has also had positive social impacts, including improved access to credit and savings for women and small businesses. A study by Engelbrecht and Kuutti (2020) discusses how financial inclusion initiatives have empowered marginalised groups.

2.7 Factors Contributing to Wallet adoption and their Impacts on Financial Behaviour

The fast expansion of mobile money and electronic transfers in Namibia has been influenced by many key factors. Firstly, there is a significant level of mobile phone saturation inside the country. According to available data, the mobile subscriber penetration rate in 2021 stood at 45%, with a total of 1.2 million customers. This figure indicates a lesser level of mobile penetration compared to the 80% mobile penetration rate seen across Africa as reported by MTC Namibia in 2018. According to estimates made in December 2020, the level of mobile penetration was around 35%. The increase in mobile penetration in Namibia can be attributed to data provided by the Namibia Statistics Agency (NSA), which indicates that approximately 15% of mobile users in Namibia possess two or more SIM cards.

These SIM cards are obtained from either the same or different service providers, namely TN mobile or MTC, which are the dominant telecommunication networks in the country. One contributing aspect that is expediting the use of electronic money transfers is the accessibility of affordable recharge vouchers or data, which facilitates the execution of electronic transfers and payments. In a study conducted by Mbogo (2010), the impact of mobile payments on micro-businesses was investigated through the application of a technology acceptance model. The findings revealed that the ease of accessibility, affordability, robust security measures, and convenience associated with mobile money were significant factors that motivated micro-business owners to adopt electronic transfers. Furthermore, the utilisation of such technology facilitated the development of innovative start-up concepts, ultimately contributing to the overall success and expansion

of these micro-businesses. Before the implementation of mobile money in Namibia, a significant number of households depended on informal means to send remittances, including direct person-to-person transfers, informal channels such as bus services or drivers, reliance on friends, or utilising the postal service. However, these methods were associated with various drawbacks such as high costs, lack of security, delays in delivery, and increased risks of non-delivery or theft, among other issues. Nevertheless, it is worth noting that electronic transactions exhibit minimal prices and offer a heightened level of confidence and safety within a significantly reduced timeframe (Suri, 2015).

2.7.1 Customer Attitude

Individuals' positive and negative sentiments about doing the goal conduct are referred to as their attitudes towards it. Therefore, the more favourable attitude a person has towards a certain product or service, the greater the likelihood that person will purchase or utilise the product or service in question. To be more specific, attitudes are the major factors that impact an individual's acceptance or rejection of online banking services within the context of an online banking environment (Ahmad et al., 2020). It is vital to consider these attitudes when analysing the adoption of an online system.

2.7.2 Age

The age of the individual is a determining factor in the use of Fintech with the young generation being the one more into internet services than the elder group. Young people move faster with technology than the elders and they spend much of their time on social media and activities (Namahoot & Laohavichien, 2018).

2.7.3 Gender

Being male or female plays a role in the use of online financial services with statistics indicating that males in most African countries use more financial services than females as they are the one who goes to work (Lazard & King, 2020).

2.8 Behaviour of individuals about mobile money and savings

Individuals without access to conventional financial institutions, known as the unbanked, often rely on informal savings methods that are marked by their insecurity, inconvenience, and unpredictability (Adan, 2016; Batista & Vicente, 2017). While some informal saving methods, such as accumulating wealth through jewellery or cattle, or engaging in rotating savings groups, may provide ease for future financial objectives, they are not dependable in emergencies. Furthermore, these approaches frequently entail inherent dangers (Gugerty, 2007). Informal saving strategies, such as hiding liquid cash under a mattress, include inherent hazards, including the potential for theft or loss of assets.

The use of informal savings techniques introduces a range of concerns. In contrast, opting to save funds in a mobile money account offers enhanced safety, convenience, and reliability. The act of depositing funds into a mobile money account is deemed to be more convenient and efficient as compared to saving in a traditional financial institution, such as a bank. The proliferation of electronic money transfer services has experienced significant growth nationwide over the past decade, encompassing both rural and urban regions (Bank of Namibia, 2018). In the year 2021, it was observed that around 58.81% of the whole population of Namibia utilised electronic payment services for conducting transactions. These services included E-wallet, Nedbank money transfer, BlueVoucher, and EasyWallet, which were employed as means of making payments. The presented

figures indicate that mobile money services are seeing a more rapid growth rate compared to the banking industry inside the country.

The provision of mobile money services in both rural and urban areas presents a convenient alternative for individuals utilising both informal and formal savings mechanisms, as it eliminates the need for extensive travel to access the nearest bank. The existing literature presents a varied body of information about the relationship between mobile money usage and savings behaviours. An empirical study done in Mozambique utilised a randomised experimental design to investigate the impact of mobile money usage on farmers' savings and investments in agricultural products (Batista & Vicente, 2017). The study revealed that farmers who adopted mobile money saw a significant rise in their savings and investments compared to those who did not utilise mobile money services. A previous survey conducted on the utilisation of mobile money among smallholder farmers in Kenya also discovered that the adoption of mobile money led to an increase in farmers' motivation to save for future acquisitions of agricultural inputs. Consequently, farmers who utilised mobile money reported higher sales volumes of their produce and achieved greater profits compared to those who did not use mobile money (Kikulwe et al., 2014).

The aforementioned research suggests that the utilisation of mobile money has a positive impact on the ability of individuals from rural impoverished areas to engage in saving activities. According to the study conducted by Suri and Jack (2016), the use of mobile money was found to have a positive impact on the savings habits and financial resilience of families led by women. Many of these women reported utilising their savings to transition from agricultural occupations to entrepreneurial ventures. The data suggest that

the use of mobile money has the potential to exert a favourable influence on the saving habits of women. According to a study conducted in Burkina Faso, the utilisation of mobile money services was found to enhance the inclination of individuals with less education, residing in rural areas, earning low incomes, being female, or having irregular revenue streams to save funds for unforeseen circumstances (Ky et al.,2017). Nevertheless, the research revealed that there was no statistically significant association between the use of mobile money and the propensity to save for anticipated future occurrences.

2.9 Effects of Financial Technology on Financial Behaviour

There has been a significant transformation in the landscape of financial services brought about by Financial Technology (FinTech), which has introduced new tools and platforms that have an impact on the behaviour and decisions of consumers. The purpose of this literature review section is to investigate the many ways in which FinTech influences users' financial behaviour, including both the positive and negative consequences that have been documented in recent research.

2.9.1 Convenience and Accessibility

According to Lusardi and Mitchell (2019), advancements in the field of financial technology, such as mobile banking applications and online payment systems, have helped to considerably improve the ease and accessibility of financial services. Individuals now can manage their financial affairs whenever and wherever they choose, which has resulted in more monitoring and improved methods of financial management.

Financial technology (FinTech) has significantly improved the accessibility and ease of financial services, fundamentally changing how consumers handle their finances. The introduction of mobile banking applications by FinTech businesses has significantly transformed the way individuals engage with their financial matters (Gupta & Arora, 2019). These applications offer simple accessibility to account balances, transaction history, and bill payments using mobile devices, therefore avoiding the necessity of physically visiting banks. Nevertheless, advancements in Financial Technology (FinTech), such as digital wallets and peer-to-peer payment systems, have streamlined the payment process (Mishkin, 2020). Users could promptly transfer funds by utilising their cell phones, therefore decreasing their dependence on physical currency and conventional banking systems. Research also indicates that FinTech has significantly contributed to enhancing financial inclusion by offering services to marginalised communities (Kumar & Chauhan, 2020). Previously marginalised individuals now can utilise basic financial services via mobile phones and the internet, overcoming their exclusion from traditional banking institutions.

Ultimately, FinTech has greatly increased the ease and availability of financial services by introducing advancements like mobile banking applications, digital payment systems, and better initiatives for financial inclusion. These developments have not only revolutionised how consumers behave but also played a significant role in promoting economic empowerment and financial resilience on a worldwide scale.

2.9.2 Financial Inclusion

FinTech has been critical in increasing financial inclusion by offering services to marginalised communities and individuals without access to conventional banking

institutions (Kumar & Chauhan, 2020). This incorporation has the prospective to enhance individuals' economic empowerment and enhance their overall financial welfare.

FinTech has become a potent weapon in advancing financial inclusion, with the goal of offering inexpensive and easily accessible financial services to marginalised communities. Mobile banking and payment platforms have increased the availability of essential financial services, such as savings accounts and money transfers, especially in areas with insufficient banking infrastructure (GSMA, 2021). These platforms utilise mobile phones to facilitate transactions and administer accounts, targeting persons who are geographically distant or financially disadvantaged. FinTech has transformed lending processes by utilising digital platforms that enable microloans and peer-to-peer lending (Allen & Rahman, 2020). These platforms utilise alternative credit scoring methods that rely on mobile data and transaction histories to provide credit to persons who are often excluded from mainstream financial institutions.

FinTech solutions have effectively decreased the expenses related to financial services transactions, hence increasing their accessibility to low-income people (Suri & Jack, 2016). FinTech platforms improve the cost-effectiveness of financial transactions and savings products by getting rid of fees and reducing operating expenditures. FinTech applications have enhanced the usability of financial services for those with poor literacy and digital abilities through the implementation of user-centric design (Morawczynski & Pickens, 2009). User-friendly interfaces and streamlined procedures enable consumers to autonomously handle their accounts, promoting financial competence and assurance.

FinTech has greatly improved financial inclusion by increasing the availability of financial services, lowering expenses, and improving user experience through new digital solutions. To achieve inclusive and sustainable financial ecosystems worldwide, it is essential to address obstacles such as digital literacy and regulatory impediments via ongoing innovation and collaboration among stakeholders.

2.9.3 Cybersecurity Risks

The rapid integration of Financial Technology (FinTech) has completely transformed financial services, while simultaneously bringing up substantial cybersecurity vulnerabilities. FinTech's digital nature exposes it to cybersecurity concerns, including data breaches and identity theft, which have the potential to erode customers confidence and impact financial behaviour (Larcker & Tsai, 2021). FinTech platforms gather and retain sensitive personal and financial information, which makes them attractive targets for cybercriminals (Kshetri, 2017). Data breaches have the potential to result in identity theft, fraudulent activities, and financial detriment, which can undermine the confidence of consumers in digital financial services. Nevertheless, digital payment systems are susceptible to several vulnerabilities, including virus assaults, phishing schemes, and unauthorised access to payment accounts (Chen & Huang, 2020). Payment infrastructure vulnerabilities can jeopardise transaction security and disrupt financial operations. Security concerns may discourage certain persons from fully participating in FinTech platforms. FinTech organisations are vulnerable to cyber risks and regulatory differences due to their international activities (Levi, 2017). Global cooperation is crucial for tackling cybercrime and unifying cybersecurity standards across different legal jurisdictions.

In short, whilst FinTech advancements provide unparalleled ease and accessibility in the realm of financial services, they also present substantial cybersecurity vulnerabilities. To mitigate these dangers, it is necessary to adopt a comprehensive strategy that encompasses technical innovations, regulatory supervision, and cooperation across different sectors of the business. This approach aims to safeguard customer data and maintain the trustworthiness of digital financial transactions.

2.9.4 Behavioural Biases

FinTech has brought out innovative tools and platforms that can impact the way individuals make financial decisions. Behavioural economics indicates that FinTech has the potential to worsen specific cognitive biases, such as excessive faith in automated investing algorithms or excessive spending made easier by seamless payment systems (Barberis, 2018). FinTech platforms frequently utilise algorithms and robo-advisors to aid consumers in making financial decisions (Barberis, 2018). The automation and seeming impartiality of these systems might cause users to display excessive confidence in their investing methods, neglecting conventional risk evaluation rules.

FinTech businesses provide digital payment solutions that facilitate smooth transactions and spur impulsive purchases (Thaler & Sunstein, 2008). The convenience of conducting transactions using mobile applications or online platforms may incentivise individuals to engage in impulsive spending, disregarding their long-term financial objectives. These biases might result in less-than-ideal financial decisions. FinTech companies could use behavioural design concepts in order to reduce biases and encourage responsible financial behaviours (Mullainathan & Shafir, 2013). Features such as prompts for savings

objectives, tailored financial guidance, and immediate feedback on expenditure patterns can assist users in making well-informed financial choices.

FinTech technologies provide an opportunity for improving financial management and inclusion, but they also pose issues associated with behavioural biases. To promote responsible use of FinTech and improve financial results, it is necessary to address these biases through good design, user education, and regulatory monitoring.

2.9.5 Digital Divide

FinTech has the capacity to address gaps in financial inclusion, but it can also contribute to the creation or worsening of digital disparities. Although there have been attempts to encourage financial inclusion, the digital gap continues to impede certain sectors of the population, restricting their ability to utilise the advantages of FinTech and perhaps exacerbating economic inequalities (Chen & Zhang, 2022). FinTech utilises digital infrastructure, including internet access and mobile devices, to provide financial services (Arun & Chmelarova, 2019). Unequal access to dependable internet and limited smartphone usage might impede consumers' capacity to take advantage of FinTech advancements, especially in rural or disadvantaged regions. To effectively utilise FinTech services, individuals must possess digital literacy and the ability to traverse online platforms and comprehend financial products (Hossein & Subramaniam, 2020). The lack of sufficient digital skills, especially among older persons and marginalised populations, might hinder the acceptance and effective use of FinTech solutions.

Although FinTech has undoubtedly brought about substantial improvements in financial behaviour by enhancing convenience, cost efficiency, and financial inclusion, it also

presents concerns in terms of cybersecurity, behavioural biases, and digital accessibility. Further investigation is necessary to delve into these processes to provide guidance to policymakers and financial institutions in facilitating the appropriate implementation and oversight of FinTech.

2.10 Gender Disparities in the Adoption of Mobile Money Services (FinTech)

Mobile money services have significantly transformed global financial inclusion, yet there are noticeable discrepancies in the rates at which different genders have adopted these services. This literature review investigates the factors that contribute to gender discrepancies in the likelihood of using mobile money services and considers potential consequences for financial inclusion.

2.10.1 Socioeconomic Factors

Gender discrepancies in the adoption of mobile money are frequently driven by socioeconomic factors such as income levels and educational attainment (Jack & Suri, 2014). Women, especially those in low-income homes, may have restricted availability to mobile phones or lack of financial knowledge, which hampers their rates of adoption. Moreover, the levels of income have a substantial impact on the formation of gender differences in the adoption of FinTech. Women, especially those from low-income households, may face financial constraints when it comes to affording cell phones or internet connectivity necessary for using FinTech services (Kumar & Chauhan, 2020).

Level of education directly impacts their digital literacy and their proficiency in properly using FinTech platforms. Women with little educational attainment may have difficulties in comprehending the advantages and functions of FinTech products, thereby impeding

their adoption (Arun & Chmelarova, 2019). Cultural and social norms play a significant role in shaping gender disparities in mobile money adoption. Studies suggest that traditional gender roles and expectations can discourage women from using mobile money services independently (Morawczynski & Pickens, 2009). Cultural norms and conventional gender roles are thought to impact women's autonomy in making decisions about financial concerns and adopting technology (Morawczynski & Pickens, 2009). Within several countries, women sometimes depend on male family members for making financial judgements or may lack the self-assurance to freely interact with FinTech platforms. Nevertheless, gender discrepancies in FinTech adoption are largely influenced by socioeconomic variables such as financial inequality, educational attainment, cultural norms, and trust judgements. To overcome these obstacles, it is necessary for stakeholders to work together and build inclusive policies, improve digital literacy, and encourage the use of gender-sensitive techniques in the development and implementation of FinTech.

2.10.2 Technological Literacy and Access

Technological knowledge and access play a crucial role in determining the adoption of FinTech, which in turn affects the gender gap in obtaining digital financial services. Gender disparities in technology literacy and limited access to mobile phones pose significant obstacles for women in embracing mobile money services (Mas, 2018). Women's engagement is further limited by their limited knowledge of digital technology and challenges with internet access. Proficiency in technology, which encompasses digital abilities and familiarity with digital platforms, has a substantial influence on users' capacity to successfully accept and utilise FinTech services (Hossein & Subramaniam, 2020). Women, especially those from disadvantaged socioeconomic origins or older age

groups, may have lower levels of digital literacy compared to males, which restricts their confidence and expertise in utilising FinTech services.

Acquiring a high level of education is essential for developing proficiency in technology and digital abilities in persons. The gender gap in FinTech adoption may be exacerbated by inequalities in access to high-quality education and vocational training programs. Women with weaker educational backgrounds may have difficulties in obtaining the essential digital abilities required in this field (Arun & Chmelarova, 2019). Nevertheless, the availability of dependable internet connectivity is also a crucial requirement for accessing FinTech services. The unequal distribution of internet connectivity based on gender, especially in rural or underdeveloped regions, might hinder women's engagement in digital financial ecosystems (GSMA, 2021). Inadequate infrastructure and high costs prevent fair access to internet banking, mobile payments, and other FinTech advancements. Having ownership of smartphones and other digital devices is crucial for actively participating in FinTech platforms. Women's access to personal devices may be restricted owing to economic limitations or cultural practices that prioritise spending on male family members (Morawczynski & Pickens, 2009). This lack of ownership and reliance on shared devices might discourage women from accessing FinTech services on their own.

2.11 Implications for Financial Inclusion

2.11.1 Empowerment and Economic Benefits

Providing women with safe and easy financial tools can help them become more economically independent, according to Donovan and Green's research from 2020. This can be accomplished by closing the gender gap in mobile money adoption. As a result of

increased financial inclusion, women may be able to improve their savings, investment options, and overall financial resilience.

2.11.2 Policy and Regulatory Interventions

According to Kramer (2015), policymakers and financial institutions can significantly reduce gender gaps via the implementation of focused interventions such as gender-sensitive product design and instructional initiatives. It is also quite important to have regulatory frameworks that make it possible for women to have equal access to financial services.

However, even though mobile money services present a huge opportunity for financial inclusion, gender discrepancies continue to exist because of socioeconomic, cultural, and technological restrictions being present. To address these gaps, various measures that allow women to gain economic independence and encourage fair access to digital financial services are required.

2.12 Effect of FinTech Adoption on the Probability of Saving and Borrowing

Individuals' behaviours about saving and borrowing have been influenced because of the adoption of FinTech, which has transformed the landscape of financial services. The purpose of this literature review is to investigate the ways in which the implementation of FinTech influences the possibilities of saving and borrowing money, focussing on both the good and negative consequences that have been discovered in recent research.

2.12.1 Impact on Saving Behaviour

2.12.1.1 Enhanced Access and Convenience

According to Lusardi and Tufano (2015), the proliferation of FinTech platforms, which include mobile banking applications and automated savings tools, has made saving money more accessible and simpler. As a result of the ability to set up automated transfers, monitor spending patterns, and receive real-time information on their savings status, individuals are far more likely to engage in consistent saving behaviour.

2.12.1.2 Behavioural Nudges

Behavioural economics ideas are frequently included into financial technology apps to encourage users to adhere to their savings objectives (Thaler & Sunstein, 2008). Using psychological mechanisms, features such as round-up savings and goal-based saving prompts have the potential to boost individuals' tendency to save resources.

2.12.2 Impact on Borrowing Behaviour

2.12.2.1 Alternative Lending Platforms

According to Allen and Rahman (2020) innovations in financial technology have made it easier for marginalised communities and small enterprises to have access to loans through alternative lending platforms. The usage of these platforms frequently involves the implementation of novel credit scoring models that consider non-traditional data points, which has the potential to increase the possibility of borrowing for persons who were previously excluded.

2.12.2.2 Lower Transaction Costs

According to Hornuf and Schwienbacher (2018), the digitisation of lending procedures has resulted in a reduction in the transaction costs associated with borrowing money. These transaction costs include application fees and processing periods. For consumers who may have been discouraged by the fees that are often charged by traditional banking institutions, lower prices make borrowing more appealing and attainable.

The adoption of FinTech, on the other hand, has significant ramifications for the behaviours of saving and borrowing, as it provides improved access, convenience, and cost-efficiency. However, even though these innovations have the potential to advance financial inclusion and responsible financial management, there are problems that require attention from policymakers and financial institutions. These challenges include potential over-reliance on credit and opportunities for cybersecurity threats.

2.13 Empirical Review

2.13.1 Studies in Africa

Historically, the provision of financial services in Africa has been recognised as insufficient to meet demand. Demirgüç-Kunt and Klapper (2012b) noted that merely 23% of adults possess a formal account, with significant disparities within nations. Despite being elevated, this figure was still recorded at a modest 34% in 2017 (Demirguc-kunt et al., 2017). In Eastern and Southern Africa, fixed fees and substantial expenditures associated with account establishment and maintenance were seen as significant obstacles (Gebregziabher & Makina, 2015). For instance, in Uganda, the annual costs for a cheque account exceed 25% of the per capita GDP (Beck, Demirguc-kunt, Soledad, & Peria, 2006). Recent studies in Africa suggest that factors such as education level, GDP per

capita, population, and interest rates can positively affect financial inclusion in the region, although they do not differentiate between demand and supply-side variables (Olaniyi & Adeoye, 2016; Zins & Weill, 2016). The elevated banking costs, inadequate educational attainment, low per capita GDP, and substantial population sizes have all been identified as determinants influencing the degree of financial inclusion in Africa.

A significant advancement in Africa, which has catalysed the enhancement of financial service delivery, is the accessibility and utilisation of mobile phones. An ITU research noted that Sub-Saharan Africa has tenfold more mobile phones than landlines, with 60% of the population possessing mobile phone coverage (Aker & Mbiti, 2010). Between 2005 and 2007, mobile phone subscriptions in Africa surged to roughly three times the rate of Europe (Aker & Mbiti, 2010). Consequently, the quantity of mobile phone users has surpassed that of individuals possessing bank accounts in the region (Etim, 2014). The banking and telecommunications sectors have leveraged this increased penetration to spearhead the development and implementation of mobile-based Fintech services, especially in money transfers (Ehrbeck, Pickens, & Tarazi, 2012). This is promising, as the influence of mobile phones on economic growth in a selection of African nations from 1988 to 2007 was found to be beneficial (Kpodar & Andrianaivo, 2011). The spread of mobile phone coverage has been minimal in Ethiopia, Somalia, and the landlocked nations of Central and West Africa (Aker & Mbiti, 2010).

Notwithstanding the increase in mobile financial services, conventional financial services remain a pertinent means of financial inclusion. The proportion of individuals with an account at a formal financial institution is significant, particularly in the Southern area, with 80% in Mauritius, 54% in South Africa, and approximately 40% in Angola,

Mozambique, and Zimbabwe (Olaniyi, 2015). Mobile banking has fostered innovations in Sub-Saharan Africa; nonetheless, it remains highly fragmented, characterised by a limited number of notable achievements. Mbiti & Weil (2011) illustrate that after eight months of M-Pesa's 2007 introduction, Safaricom reported over 1.1 million registered users and more over USD 87 million exchanged via the system. As of September 2009, more than 8.5 million Kenyans had enrolled for the service, and US$3.7 billion (about 10 percent of Kenya's GDP) had been transacted over the system since its start.

An increasing body of empirical research demonstrates the consequences of using mobile money for outcomes such as saving money and taking out loans. Using data from Tanzania, Naito et al. (2021) show that using mobile money services enhances the chance of saving and receiving remittances while lowering the likelihood of saving in less liquid assets such as livestock. These findings were based on the findings of a study that was conducted in Tanzania. Continuing with our look at Tanzania, Riley (2018) found that families that utilise mobile money services are likely to face a fall in per capita expenditure following an aggregate shock. This was the case in Tanzania.

Additionally, Jack and Suri (2014) shed light on the consumption smoothing that might occur because of utilising mobile money services in Kenya. Equally, Ky et al. (2017) provided evidence using data from Burkina Faso that utilising mobile money services is likely to improve the inclination of members of disadvantaged groups such as rural residents, females, and those with lower levels of education to save money for unexpected medical expenses. In their study utilising experimental data collected in Mozambique, Batista and Vicente (2020) found that remunerated mobile money savings accounts only enhanced mobile savings when interest was paid.

According to research by Munyegera and Matsumoto (2016), people who use mobile money services in Uganda receive remittances more frequently and make greater consumer expenditures than people who do not.

2.13.2 Studies from Namibia

Several studies have been carried out in Namibia, Jentzsch (2021) carried out a study on the relationship between financial literacy and the use of financial products in Namibia. The findings of the study indicated that there is a significant positive relationship between the two.

A study by Shigwedha & Mungunda (2021) was carried out on financial inclusion and access to banking services in Namibia. This study examines the accessibility of banking services across Namibia, highlighting disparities between urban and rural areas. The authors find that while urban areas are well-served, rural regions face significant barriers to accessing formal banking services. The study suggests that improvements in infrastructure and service delivery are needed to enhance financial inclusion in underserved areas.

Naik & Venter (2020), also carried a study in Namibia on the impact of mobile money on financial inclusion in Namibia. This research explores the role of mobile money in improving financial inclusion in Namibia. The study highlights how mobile banking and fintech innovations have expanded financial access, particularly for rural and low-income populations. The authors emphasize the positive impact of mobile money on financial services accessibility and economic empowerment.

Financial sector deepening Namibia (FSD Namibia) (2022) also carried out a study on financial inclusion in Namibia: challenges and opportunities. This report identifies and analyses the key challenges to financial inclusion in Namibia, including limited infrastructure in remote areas and low financial literacy. The study provides a comprehensive overview of the barriers to financial inclusion and suggests strategies to address these issues, such as expanding digital financial services and enhancing financial education.

Becker & Ndeed (2019) carried out a research on financial literacy and its impact on financial inclusion in Namibia. This study investigates the relationship between financial literacy and financial inclusion in Namibia. The authors found that low levels of financial literacy are a significant barriers to financial inclusion, impacting individuals' ability to access and use financial services effectively. The study suggests that improving financial literacy is crucial for enhancing financial inclusion.

Another study by Othieno & Heine (2021) titled financial inclusion and economic development: evidence from Namibia was done in Namibia. This study explores the relationship between financial inclusion and economic development in Namibia. The authors provide evidence that increased financial inclusion contributes to economic growth and poverty reduction. The study highlights how broader access to financial services supports economic stability and entrepreneurial activity.

Engelbrecht and Kuutti (2020) also carried a study on the social impacts of financial inclusion in Namibia. This research examines the social effects of financial inclusion initiatives in Namibia. The authors discuss how improved access to financial services has

positively impacted various marginalized groups, including women and small business owners. The study highlights the empowerment effects and the broader social benefits of financial inclusion efforts.

Financial Sector Deepening Namibia (FSD Namibia) (2023) carried a study on the recommendations for advancing financial inclusion in Namibia. This report provides an evaluation of current financial inclusion policies and offers strategic recommendations for further advancement. The study emphasizes the need for continued policy support, infrastructure development, and innovative financial solutions to enhance financial inclusion in Namibia.

These studies collectively offer a broad view of the financial inclusion landscape in Namibia, addressing various aspects from policy and infrastructure to the social and economic impacts of financial services. They provide a foundation for understanding both the progress made and the ongoing challenges in expanding financial inclusion in the country.

2.14 Gender Impact of Financial Technology on Financial Behaviour

The integration of gender into the analysis of Financial Technology (Fintech) adoption and its impact on financial behaviour is an essential but often overlooked aspect of the broader financial inclusion discourse. While a wealth of literature has discussed Fintech's role in promoting financial inclusion, especially for underserved populations, few studies have focused on gender-specific factors that shape Fintech adoption, borrowing, and saving behaviours. In developing countries like Namibia, where gender disparities in financial access are still prominent, understanding how women and men interact with digital financial services is crucial.

Recent studies have highlighted the gender gap in financial inclusion, indicating that women tend to be excluded from formal financial systems more than men due to socio-cultural, economic, and structural barriers (Munyegera & Matsumoto, 2020). However, these studies often fail to disaggregate the data by gender when exploring the broader impacts of Fintech on financial behaviour. Women's adoption of Fintech services, for example, may differ significantly from men's, as women are generally more risk-averse and more concerned with issues like privacy and security in digital transactions (Gine & Mansuri, 2022). These differences in adoption patterns could, in turn, affect financial behaviours such as saving and borrowing, yet they are rarely addressed in existing research on Fintech's impact.

Moreover, while some studies acknowledge gender disparities in financial behaviour—such as differences in borrowing patterns, saving habits, or credit access—the lack of gender-disaggregated data remains a significant gap in the literature. For instance, a study by Fisher and Alston (2021) found that while both men and women engage with digital financial services, women tend to have lower levels of financial literacy and face greater challenges in accessing mobile money or online loans. The influence of these gendered factors on financial decision-making is yet to be thoroughly investigated.

This gap in the literature justifies the need for research focused on the gendered dimensions of Fintech adoption and its effects on financial behaviour. Specifically, the existing body of work fails to adequately explain how Fintech adoption is shaped by gender, nor does it explore how gender-specific factors influence behaviours such as borrowing and saving in a digital financial landscape. This study seeks to fill this gap by

examining gender disparities in Fintech adoption in Namibia and analysing the corresponding effects on financial behaviours.

2.15 Research Gap and Justification for the Study

The lack of gender-disaggregated evidence in Fintech research presents a significant gap in understanding how digital financial tools impact women and men differently, particularly in Namibia. While there is growing recognition of financial inclusion as a driver of development, the nuances of gendered access to Fintech services and their subsequent effect on financial behaviours remain underexplored. There is a critical need for gender-sensitive research that looks at how Fintech adoption affects financial decision-making, such as borrowing and saving, from a gendered perspective.

By focusing on Namibia, this study will provide a contextual understanding of the gendered impact of Fintech, a critical area of research that has been neglected in the current literature. Addressing this gap will contribute to a deeper understanding of the barriers women face in accessing digital financial services and the behavioural differences in financial decisions influenced by gender.

2.16 Conclusion

The review of the existing literature reveals two notable characteristics. Firstly, individuals belonging to vulnerable groups tend to rely on informal savings mechanisms as a result of limited financial inclusion in developing nations. Secondly, the impact of adopting and utilising mobile money on individuals' savings patterns remains uncertain. This observation indicates the existence of a discrepancy in the available information about the nature of the relationship between savings and mobile money utilisation. The

subsequent Chapter delves into the examination of the interplay between mobile money and individuals' savings behaviours, focusing on the dataset, variables, and estimating method employed.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This research examines the effect of mobile financial services on the savings and behaviour of Namibians. This Chapter presents a description of the data used in the study, the variables selected for the analysis and how these variables are constructed., The Chapter further outlines the empirical methodology adopted for the analysis of the specific objectives. The present study employed the Stata 17, a statistical software programme widely utilised for the analysis of quantitative data, following a set of established protocols.

3.2 Presentation of Data and Variables

3.2.1 Data Description: The Global Findex 2021 in Namibia

The Global Findex 2021 dataset for Namibia offers a comprehensive examination of financial inclusion in the country. The data were gathered between September 29 and October 13, 2021. The study, conducted by Gallup, Inc. in collaboration with its annual Gallup World Poll, employed face-to-face interviews because Namibia has inadequate telephone coverage, which is less than 80%. This methodology is in accordance with established norms in economies where conducting surveys in person is more practical.

The primary goals of the survey were to evaluate financial behaviours such as saving, borrowing, payment methods, and risk management. It specifically aimed to examine the adoption of digital payments and financial resilience in reaction to the COVID-19 pandemic. The survey was conducted in English, Oshiwambo, and Afrikaans, guaranteeing extensive representation across all linguistic groupings.

The sampling technique was intentionally designed to provide both representativeness and resilience. The primary sampling units were stratified based on both population size and geographic dispersion. Clustering was accomplished through numerous steps of sampling. The respondents were chosen randomly from houses, and interviewers made up to three efforts to reach each family at various times and days to improve the response rate. The final sample consisted of 1,000 people, with each individual response being analysed individually. The study received financial backing from the Development Research Group of the World Bank, who supplied the main financing, and the Bill and Melinda Gates Foundation, who donated extra funds. The strong financial support allowed for the thorough gathering and examination of data, providing unique insights into the dynamics of financial inclusion in Namibia and permitting rigorous comparisons across other countries in global financial research.

The following variables were selected for the study. The dependent variable is financial behaviour (saving and borrowing). When examining financial behaviour, specifically saving and borrowing, as the dependent variable in research on financial inclusion, it is crucial to understand how different factors influence these behaviours. The independent variables considered includes Mobile Money (MM) and it constitutes how individuals use mobile money. Gender of individuals who uses mobile money, which indicates the sex of

the head of the household (male or female). Age indicates the age of individuals male or female at the time of the survey. The following table gives a summary of the different variables selected for study and their nature.

Table 3. 1: Variables Selected for Study

Dependent Variables		
Variable	**Nature**	**Description of Coding**
Savings	Dummy	1, if the individual has savings & 0, otherwise
Borrowing	Dummy	1, if the individual borrows & 0, otherwise
Independent Variable		
Mobile money (MM)	Dummy	1, if individual uses mobile money & 0, otherwise
Gender	Dummy	1, if male & 0, otherwise
Age	Continuous	expressed in years
Educational level		
Primary education	Dummy	1, if individual has primary education & 0, otherwise.
Secondary education	Dummy	1, if individual has secondary education & 0, otherwise.
Tertiary education	Dummy	1, if individual has tertiary education & 0, otherwise.
Income group		
Low-income group	Dummy	1, if individual is in the low-income group & 0, otherwise.
Middle income group	Dummy	1, if individual is in the middle-income group & 0, otherwise.
High income group	Dummy	1, if individual is in the high-income group & 0, otherwise.

Urban residency	Dummy	1, if individual resides in urban area& 0, otherwise.
Workforce	Dummy	1, if individual is in the workforce & 0, otherwise.
Financial account	Dummy	1, if individual has a financial account & 0, otherwise.

Source: Constructed by author.

3.2.2 Expected Relationships between the Dependent and Independent Variables

Mobile money platforms have considerably improved financial inclusion, increased savings and borrowing habits, particularly in poor countries (Jack & Suri, 2014; World Bank, 2021). According to research, using mobile money increases savings by 21% and borrowing by 10% since it lowers transaction costs and improves credit access (Suri & Jack, 2016). Furthermore, mobile money helps to bridge the gender gap in financial inclusion by giving women more control over their financial resources (Aterido et al., 2013). The correlations among the independent variables—Mobile Money (MM), Gender, and Age—and the dependent variables of savings and borrowing illustrate how institutional and technical elements influence financial decision-making. Mobile money is expected to exhibit positive elasticity in relation to both savings and borrowing. MM platforms provide accessibility and convenience, hence lowering transaction costs and elevating the marginal propensity to save, especially for those lacking access to conventional banking services. Moreover, MM services frequently enhance access to microcredit, augmenting credit elasticity for low-income or unbanked individuals by providing affordable, small-scale loans that may otherwise be inaccessible due to information asymmetries in formal financial markets. This establishes a feedback loop in

which enhanced liquidity and simplified financial transactions promote saving and borrowing behaviours.

Gender, as a demographic variable, generates disparities in financial behaviour, shaped by social inequality and gender-specific access to financial resources. Although women are often linked to greater precautionary savings, their borrowing behaviours may be restricted by credit rationing or insufficient financial literacy, particularly in patriarchal settings. The emergence of women-centric microfinance initiatives has alleviated these obstacles, increasing women's engagement in credit markets. Age has a distinct lifecycle effect, wherein life-cycle assumptions indicate that younger individuals tend to borrow more to fund education, consumption, and asset acquisition, whereas older individuals focus on asset accumulation and savings in anticipation of retirement. This age-related behaviour corresponds with intertemporal consumption smoothing, when individuals optimize their financial choices based on anticipated lifetime income and expenditures.

Table 3. 2: Expected Relationship Summary

Independent Variable	Dependent Variable	Expected Relationship
Mobile Money (MM)	**Savings**	**Positive**
Mobile Money (MM)	**Borrowings**	**Positive**
Gender (Men)	**Savings**	**Negative or Context Dependent**
Gender (Men)	**Borrowings**	**Mixed (depending on access to credit)**
Age (Older)	**Savings**	**Positive**
Age (Older)	**Borrowings**	**Negative**

These expected relationships highlight how financial technology, social factors and life stages shape an individual's savings and borrowing behaviour.

3.3 Empirical Methodology

3.3.1 Descriptive Statistics

Th study uses key descriptive statistics to summarize the study's data, including the mean, standard deviation, minimum, and maximum values of each variable. These statistics provide insights into the central tendency, variability, and range of the data, offering a foundational understanding of the dataset's characteristics. The mean reflects the average value, the standard deviation indicates the degree of spread or variability, while the minimum and maximum values show the range of observations. This summary allows for a straightforward interpretation of the variables before conducting further analysis.

3.3.2 Modelling the Gender disparity in Mobile Money Adoption (Fintech).

The mobile adoption model assumes a latent variable MM^* representing the underlying propensity for mobile adoption. This latent variable is given by:

$$MM_i^* = \beta_0 + \beta_1 F_i + \sum_{k=1}^{m} \gamma_k X_{ik} + \varepsilon_i \quad (1)$$

The observed outcome MM (whether an individual adopts mobile money or not) is not directly observed but derived from the latent variable MM_i^* as follows:

$$MM_i = \begin{cases} 1, & if \quad MM_i^* > 0 \\ 0, & if \ MM_i^* \leq 0 \end{cases} \tag{2}$$

where:

MM_i^* is the unobserved continuous variable denoting the underlying propensity of an individual to adopt mobile mobile. Therefore, $MM = 1$ if the latent variable MM_i^*exceeds a threshold of zero, indicating that the individual's propensity for mobile adoption is high enough to result in actual adoption.

F_i denotes the gender dummy which takes the value 1 if individual is female and 0 otherwise. Indeed, the coefficient of the gender dummy β_1 captures the gender gap in mobile money adoption. The statistical significance or non-significance of β_1 plays a critical role in testing the first hypothesis of this study, which concerns the existence of gender disparity in mobile money adoption. A statistically significant β_1 (either positive or negative) would indicate that there is indeed a gender-based difference in mobile money adoption rates, thus supporting the hypothesis of gender disparity. On the other hand, if β_1 is not statistically significant, it suggests no substantial difference in mobile money adoption between men and women after accounting for other explanatory factors.

In the model X denotes the vector of other explanatory variables considered in the model such the age of the individual, income group, educational level, zone of residency, workforce status and ownership of financial account. γ_k represents the corresponding

parameters of the other explanatory variables to be estimated. ε_i is a random error term assumed to follow a standard normal distribution.

Our dependent variable, Mobile money (MM), is binary, requiring us to use either a probit or logit model for the estimation. Based on the plausibility of the normality assumption, we intend to estimate the model using the probit model. Based on the standard normal distribution of ε_i, we can express the probability of observing $MM = 1$ as:

$$Pr(MM_i = 1|F_i, X_i) = Pr(MM_i^* > 0|F_i, X_i) \quad (3)$$

Substituting MM_i^* from the latent variable equation (Equation 1), we obtain the following:

$$Pr(MM_i = 1|F_i, X_i) = Pr(\beta_0 + \beta_1 F_i + \sum_{k=1}^{m} \gamma_k X_{ik} + \varepsilon_i > 0|F_i, X_i) \quad (4)$$

Rearranging to isolate error term ε_i, we have the following:

$$Pr(MM_i = 1|F_i, X_i) = Pr\left(\varepsilon_i > -\left(\beta_0 + \beta_1 F_i + \sum_{k=1}^{m} \gamma_k X_{ik}\right)\right) \quad (5)$$

Since ε_i follows a standard normal distribution, this probability can be written in terms of the cumulative distribution function Φ of the standard normal distribution:

$$Pr(MM_i = 1|F_i, X_i)$$

$$= \Phi\left(\beta_0 + \beta_1 F_i + \sum_{k=1}^{m} \gamma_k X_{ik}\right) \quad (6$$

Where, Φ **(·)** transforms the linear combination of predictors into a probability (bounded between 0 and 1). F denotes the gender dummy which takes the value 1 if the individual is female and 0, otherwise. The coefficient of gender dummy captures the gender gap in mobile adoption. Specifically, it quantifies the difference in the likelihood of adopting and using mobile money services between men and women.

In the context of a probit model, it is customary to interpret the marginal effects. The marginal effects tell us how a one-unit change in each predictor variable affects the probability of the observed outcome (mobile adoption) when other variables are held constant. Since the probit model uses a nonlinear transformation, marginal effects vary depending on the values of the predictors.

The marginal effect of gender, F, on the probability of mobile money adoption is given by the partial derivative of $Pr(MM_i = 1|F_i, X_i)$ with respect to F_i:

$$\frac{\partial Pr(MM_i = 1|F_i, X_i)}{\partial F_i}$$

$$= \phi\left(\beta_0 + \beta_1 F_i + \sum_{k=1}^{m} \gamma_k X_{ik}\right).\beta_1 \quad (7)$$

While the marginal effects for the other control variables is given as:

$$\frac{\partial Pr(MM_i = 1|F_i, X_i)}{\partial X_{ik}}$$

$$= \phi\left(\beta_0 + \beta_1 F_i + \sum_{k=1}^{m} \gamma_k X_{ik}\right).\gamma_k \quad (8)$$

Where, ϕ is the probability density function (PDF) of the standard normal distribution, evaluated at the linear predictor $\beta_0 + \beta_1 F_i + \sum_{k=1}^{m} \gamma_k X_{ik}$.

3.3.3 Modelling the Effect of Mobile Money on Financial Behavior: The Moderating Role of Gender

This subsection outlines the empirical strategy employed to analyse the effect of mobile money adoption on individuals' financial behaviour while considering the moderating role of gender in this relationship. The empirical estimation model used to examine the effect of mobile money on financial behaviour is the Control function approach. The outcome variable-financial behaviour in this study is captured using the saving behaviour and borrowing behaviour of individuals. That is,

$$Saving = \begin{cases} 1, if\ the\ individual\ has\ savings \\ 0, \qquad\qquad\qquad otherwise \end{cases}$$

$$Borrowing = \begin{cases} 1, if\ the\ individual\ borrowed \\ 0, \qquad\qquad\qquad otherwise \end{cases}$$

Based on the definition of the outcome variable, the indicators of financial behaviour, specifically savings and borrowing, are binary in nature. Therefore, estimation requires the use of either a probit model or a logit model. As previously indicated, we will consider the probit model in our analysis due to the normality assumption.

The latent variable equation of financial behaviour is given as:

$$FB_i^* = \alpha_0 + \alpha_1 MM_i + \alpha_2 F_i + \alpha_1 (MM_i * F_i) + \sum_{k=1}^{m} \delta_k W_{ik} + \mu_i \qquad (9)$$

The latent variable FB_i^* is an unobserved variable that represents the propensity of an individual to exhibit certain financial behaviour (saving or borrowing). The observed outcome FB (saving or borrowing) is binary (1 if the behaviour is exhibited, 0 otherwise). The observed financial behaviour (FB_i) is defined as:

$$FB_i = \begin{cases} 1, & if \quad FB_i^* > 0 \\ 0, & if\ FB_i^* \leq 0 \end{cases} \qquad (10)$$

Without delving into the specifics of the probit modelling, and without loss of generality, the probit model for financial behaviour can be expressed as follows:

$$Pr(FB_i = 1|MM_i, F_i, X_i)$$

$$= \Phi\left(\alpha_0 + \alpha_1 MM_i + \alpha_2 F_i + \alpha_3 (MM_i * F_i) + \sum_{k=1}^{m} \delta_k W_{ik}\right) (11)$$

where:

Where, MM is the mobile money indicator which takes the value 1 if the individual adopts and uses mobile money services, and 0, otherwise. F_i denotes the gender dummy which takes the value 1 if individual is female and 0 otherwise. The statistical significance or non-significance of α_1 plays a critical role in testing the second hypothesis of this study, which concerns the effect of mobile money adoption on financial behaviour (savings or borrowing). The coefficient of the interaction term $(MM_i * F_i)$ captures the gender differentials in the effect of mobile money adoption on financial behaviour. In the model W denotes the vector of other explanatory variables considered in the model such the age of the individual, income group, educational level, zone of residency, workforce status. δ_k represents the corresponding parameters of the other explanatory variables to be estimated. μ_i is a random error term assumed to follow a standard normal distribution.

In the probit equation of financial behaviour depicted by Equation 1, the independent variable of interest—mobile money—is likely to be endogenous. The endogeneity of mobile money is expected to arise from the simultaneity between mobile money and financial behaviour (savings or borrowing). Specifically, the adoption of mobile money may influence financial behaviour, while the financial behaviour of an individual can also impact their decision to adopt mobile money services. This suggests that causality is likely to be bi-directional, leading to endogeneity that must be addressed to obtain unbiased and

consistent estimates. Also, endogeneity may arise from unobservable variables, such as innate ability or financial literacy, which could correlate with the adoption of mobile money and financial behaviour. Furthermore, measurement errors can also contribute to the problem of endogeneity, as inaccuracies in the data may distort the relationship between mobile money and financial behaviour. Endogeneity is addressed in this study using the control function approach. This approach requires an instrumental variable. In this study, we use the ownership of a financial account as the instrumental variable to achieve the exclusion restriction condition.

This entails that the reduced form equation is Equation 1 and the probit version given in Equation 6. Without loss of generality, Equation 6 can be written in the following matrix format:

$$Pr(MM_i = 1|H_i,)$$
$$= \Phi(\theta Z_i) \qquad (12)$$

Where, Z is a vector of correlates that includes the instrumental variable—ownership of a financial account. Although the vectors W and Z can overlap, at least one variable in Z should not appear in W to properly identify the outcome equations. In the present study, the outcome equations are identified by including at least one instrumental variable in Z.

The estimation is based on the control function procedure suggested by Wooldridge (2015) for non-linear probit reduced forms. This method entails estimating the probit reduced form of mobile money adoption, which provides predictions of the probabilities of adoption. After estimating the probit model, we predict the probability density function

(PDF) and the cumulative density function (CDF). Following Heckman (1979), the Inverse Mills ratio is obtained by dividing the probability density function by the cumulative density function:

$$\lambda_i = \frac{\phi(Z_i\theta)}{\Phi(Z_i\theta)} \tag{13}$$

In Equation 13, $\phi(Z\theta_i)$ denotes the probability density function (PDF) while $\Phi(Z_i\theta)$ is the cumulative density function (CDF). The generalised residual (gr) is estimated using the following formula:

$$\widehat{gr}_i = MM_i\lambda_i\left(Z_i\hat{\theta}\right) - [(1 - MM_i)\lambda_i\left(-Z_i\hat{\theta}\right)] \tag{14}$$

Where $\widehat{gr}_i$ is the predicted generalised residuals. The generalised residual is then plugged into the financial behaviour generating function as an additional explanatory variable. Following Murtazashvili and Wooldridge (2016) the control function version of the financial behaviour generating function is thus given by:

$$Pr(FB_i = 1|MM_i, F_i, X_i) = \Phi\left(\varphi_0 + \varphi_1 MM_i + \varphi_2 F_i + \varphi_3(MM_i * F_i) + \sum_{k=4}^{n}\varphi_k W_{ik} + \pi\widehat{gr}_i\right) \tag{15}$$

In Equation 15, φ are parameters to be estimated. Specifically, φ_1 captures the effect of mobile money adoption on the probability of financial behaviour (savings or borrowing), φ_2 captures the gender gap in financial behaviour and φ_3 denotes the gender difference in the effect of mobile money on financial behaviour. $\widehat{gr}$ is the generalised residual included in the financial behaviour to correct for endogeneity of mobile money. The significance of the coefficient of the generalised residual (π) plays a crucial role in diagnosing endogeneity. If π is statistically significant, this indicates the presence of endogeneity in the model, confirming that unobserved factors affecting both mobile money adoption and financial behaviour are present. If π not significant, it suggests that endogeneity may not be a concern, implying that the estimates for the effects of mobile money adoption on financial behaviour can be considered unbiased.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the study's findings in structured sections. Section 4.2 provides the descriptive statistics of the variables analysed. Section 4.3 examines the determinants of mobile money adoption, outlining key factors influencing individuals' likelihood of adopting mobile money. Section 4.4 presents the control function estimates of the effect of mobile money adoption on financial behaviour, analysing how mobile money use affects practices such as saving and borrowing.

4.2 Descriptive statistics

The weighted and unweighted descriptive statistics are presented for the variables used in the analysis.

4.2.1 Weighted and unweighted Descriptive Statistics

Table 1 displays the weighted descriptive statistics of the variables employed in the analysis. The descriptive result indicates that 56.3 % of the individuals surveyed have savings. A 56.3% savings rate suggests that a large proportion of the population is actively saving money, reflecting some degree of financial responsibility and prudence among a sizeable portion of the population. Increased savings rates can help financial institutions become more liquid, which makes it possible for them to lend money to people and businesses. This can lead to more opportunities for investment, promoting economic growth. Results also indicate that Namibia’s borrowing rate is about 68%. A 68% borrowing rate suggests that many people rely heavily on credit or loans to meet their

financial needs. Even though borrowing is necessary for investment and consumption, borrowing at such high rates can leave households heavily indebted.

Table 4. 1: Weighted Descriptive Statistics of Some Selected Variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Savings	1000	0.5628	0.4962	0	1
Borrowing	1000	0.6795	0.4669	0	1
Mobile money	1000	0.4262	0.4948	0	1
Female	1000	0.5332	0.4991	0	1
Age	1000	34.8227	15.5825	15	88
Age squared	1000	1455.45	1342.799	225	7744
Primary education	1000	0.3844	0.4867	0	1
Secondary education	1000	0.5279	0.4995	0	1
Tertiary education	1000	0.0780	0.2684	0	1
Low income	1000	0.3996	0.4901	0	0
Middle income	1000	0.1983	0.3990	0	1
High income	1000	0.4020	0.4905	0	1
Urban	1000	0.3587	0.4798	0	1
Workforce	1000	0.5175	0.4999	0	1
Financial account	1000	0.6557	0.4754	0	1

Source: Computed by author using the Global Findex Database of 2021 and Stata 17.

Regarding the percentage of individuals using mobile money, the results indicate that about 42.6 % of individuals use Mobile money services. The proportion of individuals using mobile money reflects the degree of financial inclusion among the population. For those needing access to regular banking services, mobile money services frequently offer access to essential financial services like transfers, payments, borrowing and savings. This can enable people to actively engage in the formal sector actively, promoting economic growth and lowering poverty. We also observed that the percentage of females in the sample is about 53%. This indicates that a sizable portion of the surveyed female population may also draw attention to the gender disparities already present in several economic indicators, including financial inclusion, income levels, access to education, and involvement in decision-making positions.

The descriptive statistics equally show that the average age of persons surveyed is about 34.8 years. This is a revelation that a sizable proportion of the population is in their prime working years, likely promoting economic innovation and vibrancy. Indeed, a younger demographic structure is more likely to adapt to technological innovation, thereby improving Fintech's adoption rate. Descriptive findings reveal that about 38.4% of the sample has a primary level of education, 52.8% are endowed with secondary education and 7.8% with tertiary education. The distribution of educational attainment has a notable impact on the adoption of mobile money. Greater digital literacy and better adoption rates may be correlated with higher educational attainment, especially at the secondary and postsecondary levels. On the other hand, those with only a primary education can find it challenging to comprehend and use mobile money services.

Descriptive statistics show that different individual's income level: 40% of people are low-income earners, 19.8% are middle-class, and 40.2 % are high-income. This distribution, which classifies a sizable section of the population as low-income earners, illustrates income inequality within the population. This income gap can affect investment decisions, consumption patterns, and economic growth.

According to the survey's results, 35.9% of the sample is urban, which represents the percentage of people who live in urban regions. The large percentage of people who live in rural areas indicates that a significant majority of the population lives outside of cities, where small businesses and agriculture are the primary sources of economic activity.

Regarding the workforce, 51.8% of the sample are working individuals. This indicates that workers are becoming more interested in digital financial technologies, which indicates a move toward Fintech integration across businesses. Descriptive findings show that 65.6% of the sample has a financial account. This high degree of account ownership suggests that Fintech platforms have made formal financial services widely available. Greater account accessibility can encourage financial inclusion and provide people with more financial power. Fintech-enabled accounts are accessible and convenient, and they may lower transaction costs and increase financial efficiency. The unweighted descriptive statistics are presented in Table 4.2.

Table 4. 2: Unweighted Descriptive Statistics of Some Selected Variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Savings	1000	0.5980	0.4905	0	1

Borrowing	1000	0.6880	0.4635	0	1
Mobile money	1000	0.5140	0.5001	0	1
Female	1000	0.5550	0.4972	0	1
Age	1000	33.7868	13.0634	15	88
Age squared	1000	1312.275	1083.763	225	7744
Primary education	1000	0.2400	0.4273	0	1
Secondary education	1000	0.6250	0.4844	0	1
Tertiary education	1000	0.1280	0.3342	0	1
Low income	1000	0.3240	0.4682	0	0
Middle income	1000	0.1670	0.3732	0	1
High income	1000	0.5090	.5002	0	1
Urban	1000	0.3700	0.4830	0	1
Workforce	1000	0.5900	0.4921	0	1
Financial account	1000	0.704	0.4567	0	1

Source: Computed by author using the Global Findex Database of 2021 and Stata 17.

4.2.2 Mean Comparison Test of Characteristics between Mobile Money Users and Mobile Money Non-Users

Table 3 presents the mean comparison test of individual and community characteristics by mobile money adoption status. Results indicate that amongst mobile money users, about 76.3% have savings; meanwhile, amongst non-users of mobile money services, findings reveal that about 42.4% have savings. The mean comparison test reveals a

significant difference in savings of about 33.9% between mobile money users and non-users of mobile money services. According to this theory, mobile money services boost financial inclusion by giving customers more outstanding saving options, reflecting improved customer behaviour and financial literacy. A larger financial cushion against unforeseen costs and the flexibility to engage in business ventures, education, and health can all contribute to an individual's increased financial stability and overall economic growth.

Table 4. 3: Mean Comparison Test of Characteristics

VARIABLES	(1) Mobile money users	(2) Mobile money non-users	(3) Difference in means/proportion
Savings	0.7626	0.4239	0.3387***
	(0.0188)	(0.0224)	(0.0291)
Borrowings	0.7743	0.5967	0.1776***
	(0.0185)	(0.0223)	(0.0288)
Gender (female=1,0 otherwise)	0.5486	0.5617	-0.0131
	(0.0220)	(0.0225)	(0.03147)
Age	33.3634	34.2346	-0.8712
	(0.4657)	(0.6927)	(0.8264)
Primary education	0.1440	0.3416	-0.1976***
	(0.0155)	(0.0215)	(0.0263)
Secondary education	0.6556	0.5926	0.0630**
	(0.2098)	(0.0223)	(0.1875)
Tertiary education	0.1926	0.0596	0.1330***
	(0.0174)	(0.0107)	(0.0207)

Low income	0.2004	0.4547	-0.2543***
	(0.0177)	(0.0226)	(0.0285)
Middle income	0.1517	0.1831	-0.0314
	(0.0158)	(0.0176)	(0.0236)
High income	0.6478	0.3621	0.2857***
	(0.0211)	(0.0218)	(0.0303)
Urban residency	0.4377	0.2983	0.1394***
	(0.0219)	(0.0207)	(0.0302)
Workforce	0.7062	0.4671	0.2391***
	(0.0201)	(0.0226)	(0.0302)
Financial account	0.8716	0.5267	0.3449***
	(0.0147)	(0.0227)	(0 .0268)

Source: Computed by author using 2021 Global Findex Database and Stata 17. The robust standard errors are in brackets. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

Regarding borrowing behaviour, we observe that the percentage is higher for mobile money users (77.3 %) than for non-users of mobile money (59.7%). The mean comparison test reveals a difference in borrowing of about 17.8% between mobile money users and non-users of mobile money. It suggests that compared to non-users, mobile money users are more likely to use borrowing facilities. This shows that mobile money services improve financial inclusion by giving consumers faster access to credit—which can be essential for taking care of unforeseen bills, investing in business, and addressing short-term financial needs. By allowing more people to invest in profitable endeavours, a rise in borrowing among mobile money users can boost economic activity. It also emphasises the significance of financial literacy and prudent borrowing practices to avoid

becoming overly indebted. This is a preliminary indication that mobile money users have a higher propensity to save and borrow. The findings also revealed that a higher percentage of mobile and non-mobile money users are women. This indicates that more women use mobile money, and equally, more women are also non-users of mobile, which clearly indicates that they dominate in this aspect. The average age for mobile money users and non-users of mobile is about 34 years, showing no significant difference. On average, about 14.4% of mobile money users have primary education, while about 34.2% of non-users of mobile money have primary education. This implies that a higher level of education is linked to a more significant increase in mobile money services. This suggests that those with lower educational attainment may find it more difficult to become financially included since they may not be as comfortable with or trust digital financial services. Also, 65.6% of mobile money users have secondary-level education, while up to about 59.3% of the non-users of mobile money have secondary education. Indicates that the adoption of mobile money is greatly influenced by secondary education. This shows that people who have completed secondary school are more accustomed to and capable of utilising digital financial services.

On average, 19.3 % of those using mobile money services have a tertiary level of education, while 59.6 % of those not using mobile services have this level of education. This indicates that those with higher levels of education have a lower likelihood of using mobile money services because they have access to traditional banking or are wary of digital platforms. Regarding the variables on income level, the findings indicate that amongst the mobile money users, the percentage of low-income earners is about 20%; meanwhile, amongst non-users of mobile money services, the percentage of low-income

earners is 45.5%. First, it indicates a gap in financial inclusion by implying that low-income people underuse mobile money services. This discrepancy suggests that low-income populations may face obstacles like ignorance, inadequate digital literacy, or restricted access to essential technologies. It is equally observed that 15.2% of middle-income earners are mobile money users, while 18.3% are non-users of mobile money. It shows that middle-income individuals have a lower adoption rate of mobile money services than low-income individuals. This could be due to various reasons, including middle-income individuals' perceived lack of need for mobile money solutions or their access to traditional banking services. On average, 64.8 % of mobile money users are high-income earners, while 36.2% are non-users of mobile money. There is a significant mean difference of 28.5% between high-income mobile money users and high-income non-mobile money users. It implies that compared to those who do not use mobile money, high-income people who use these services engage in finance to a far greater extent. Convenience, accessibility, and extra financial management tools provided by mobile money systems could be the causes of this discrepancy. Moreover, it highlights the potential of mobile money services to address the varied financial requirements of affluent persons, encompassing wealth administration, investment prospects, and smooth payment methods.

Furthermore, 43.7% of mobile money users are urban dwellers, while only 29.3% of non-users of mobile money are urban dwellers. This implies that people living in urban areas are more inclined to use mobile money services due to having more accessible access to digital infrastructure and being aware of Fintech options available in urban areas. This suggests that there may be a mobile money adoption gap between urban and rural

communities, highlighting the need for focused outreach initiatives and infrastructure development in rural areas to encourage greater financial inclusion. Regarding the workforce, findings indicate that the mobile money users' percentage of the workforce is about 70.6%; meanwhile, amongst non-users of mobile money services, the percentage of the workforce is about 46.7%. It implies that mobile money services are extensively used by workers, demonstrating the increasing assimilation of digital financial solutions into daily business operations. This high acceptance rate among workers highlights how crucial mobile money is for enabling peer-to-peer transfers, salary payments, and other financial activities, improving worker efficiency and convenience. There is a significant difference of 23.9% between mobile money users of the workforce and non-money users of the workforce. Among the mobile money users, the percentage of individuals with financial accounts is about 87.2%; meanwhile, amongst the non-users of mobile money, the percentage of individuals with financial accounts is about 52.7%. The mean comparison percentage is 34.5% between mobile money users with financial accounts and non-users of mobile money with financial accounts. It implies a significant relationship between the adoption of mobile money and formal financial inclusion, with mobile money users being more likely to hold financial accounts than non-users. This emphasises how crucial mobile money services are to increasing access to banking services, especially for underprivileged groups who need easy access to traditional banking infrastructure.

4.3 Determinants of the Probability of Adopting Mobile Money Services (Fintech) in Namibia

Table 4 presents the determinants of the decision to use Fintech in Namibia using the probit model. Results indicate that there is no significant disparity in the probability of mobile money adoption between men and women. This finding is in line with Akinyemi, and Mushunje (2020), that indicated that no gender disparity exists in mobile money adoption in rural areas of Africa. However, the result is contrary to Suri and Jack (2016) who found that men were more likely to adopt mobile money services than women in Kenya. Mobile money technology is inherently gender-neutral, providing equal benefits and convenience to all users. The Namibian government has implemented inclusive financial policies, like the Financial Literacy Initiative and the National Financial Inclusion Strategy 2011-2021, to promote equitable access to financial services for underprivileged groups, including women. Furthermore, the use of mobile money is driven by comparable socio-economic issues and practical demands experienced by both genders. Balanced adoption rates are also ensured by Fintech companies' focused marketing efforts and cultural developments toward gender equality. In Namibia, men and women are equally likely to utilise mobile money services due to their widespread appeal, ease of use, and accessibility. This study highlights the significance of resolving gender discrepancies in financial inclusion. Women may take charge of their finances, engage more fully in the economy, and support the advancement of their homes and communities by utilising mobile money services.

Table 4. 4: Determinants of Mobile Money (Fintech) Adoption

VARIABLES	(1) Coefficient	(2) Marginal effect
Female	0.0488	0.0149
	(0.108)	(0.0327)
Age	0.0628***	0.0191***
	(0.0229)	(0.00684)
Age squared x 10^{-2}	-0.0896***	-0.0273***
	(0.0297)	(0.0088)
Secondary	0.378***	0.115***
	(0.137)	(0.0410)
Tertiary	0.770***	0.235***
	(0.192)	(0.0573)
Mid-income	0.265*	0.0808*
	(0.155)	(0.0471)
High- income	0.431***	0.131***
	(0.126)	(0.0375)
Urban	0.0629	0.0191
	(0.110)	(0.0334)
workforce	0.185	0.0563
	(0.116)	(0.0353)
Financial account	0.916***	0.279***
	(0.126)	(0.0356)
Constant	-2.383***	
	(0.410)	
Observations	1,000	1,000

Source: Computed by author using 2021 Global Findex Database and Stata 17. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

The findings further indicate that an individual's probability of adopting mobile money increases with age up to an approximate threshold of 35 years. Beyond this point, the likelihood of mobile money adoption begins to decline as age advances. This reveals a quadratic relationship between age and mobile money adoption, indicating a diminishing effect beyond a certain age. Several factors may explain this observed quadratic relationship, whereby adoption rates rise until around age 35 and then decrease. This result aligns with the findings of Meli et al. (2022), Amoah et al. (2020), Akinyemi and Mushunje (2020), Coulibaly (2021), Nonvide and Alinsato (2022), and Asravor et al. (2022), who also observed an inverse relationship between age and mobile money adoption among older individuals. Due to their greater openness to innovation, peak income and financial management needs, and higher degrees of comfort with technology, younger and middle-aged people are more likely to utilise mobile money. According to the Technology Adoption Lifecycle and socioeconomic considerations, middle-aged people gain the most from mobile money's convenience. However, adoption rates decrease when people get older than 35 because of the digital divide, heightened concern about technology, and a preference for tried-and-true traditional banking methods. Additionally, behavioural economics implies that elderly people have a status quo bias, preferring new technologies to established habits.

The marginal effects indicate that secondary and tertiary education levels are positively associated with the likelihood of adopting mobile money services. This likelihood increases as education levels rise. Individuals with secondary education are approximately 11.5% more likely to adopt mobile money services than those primary education, while those with tertiary education show a 23.5% higher likelihood. These findings align with

those of Gichuki and Mulu-Mutuku (2018), Amoah et al. (2020), Akinyemi and Mushunje (2020), Coulibaly (2021), AbdulRahaman and Abdulai (2021), and Asravor et al. (2022), who also found education to be a significant factor in mobile money technology adoption. Since educated people are more likely to have the knowledge and self-assurance needed to use mobile money services, financial literacy programs designed explicitly for less educated populations may be necessary to close the adoption gap. Additionally, since mobile money makes it easier to manage finances and obtain credit, expanding educational opportunities can substantially impact economic empowerment and participation. Middle income is not significant in the low-income group at a 5% confidence level. However, the results indicate that at a 10% confidence level, the middle-income group is 8.1% more likely to adopt mobile money than the low income. Furthermore, the findings indicate that at a 1% confidence level, high-income earners are 13.1% more likely to adopt mobile money.

Results show no significance compared with persons dwelling in the rural areas in the overall sample. According to Findex data, there are no significant disparities between urban and rural areas in Namibia's likelihood of adopting mobile money. This highlights how well mobile money promotes financial inclusion and bridges geographic gaps. Market saturation and competition in urban areas, better access to financial services in rural areas, technological leapfrogging in developing nations, the use of mobile money for economic transactions in rural economies, and government policies that support financial inclusion are some factors that may be responsible for this phenomenon. The widespread acceptance and accessibility of mobile money services are seen in the convergence of adoption rates between urban and rural areas. This represents a significant step towards

levelling the financial playing field and enabling people throughout Namibia to participate more actively in the formal economy. The marginal effect indicates that there is no significance for the workforce. The absence of importance for the workforce variable in Namibia's adoption of mobile money implies that different job statuses within the labour force do not significantly influence adoption trends. This indicates that individuals in various formal and informal economic sectors perceive mobile money services as equally valuable and convenient for performing financial transactions. The results illustrate mobile money's widespread acceptance and convenience for various economic activities.

Also, they demonstrate the significance of advocating for financial inclusion across diverse worker groups. Additionally, it implies that other socioeconomic factors, such as income levels, technological accessibility, and financial literacy, may significantly impact the frequency of mobile money usage among Namibian workers. Women with financial accounts are 27.9% more likely to use mobile money services compared to those who do not have financial accounts. Women are more willing to adopt novel financial instruments because possessing a financial account signifies financial inclusivity and knowledge. Furthermore, women with bank accounts tend to utilise digital platforms such as mobile money. This is due to their increased comfort with technology, which stems from their familiarity with formal financial services.

Moreover, mobile money's convenience and user-friendliness, particularly in regions with limited banking facilities, promote its acceptance among financially empowered women. Mobile money not only increases liberty but also empowers women by providing them with greater control over their resources. These additional attributes contribute to its attractiveness.

4.4 Effect of Fintech Adoption on the Probability of Financial Behaviour

4.4.1 Effect of Mobile Money on the probability of borrowing

This subsection aims to assess the effect of Fintech (mobile money) on borrowing behaviour in Namibia while controlling for other correlates. Table 5 presents estimates of the structural borrowing function based on various assumptions. Columns 1 and 2 present the probit estimates while columns 3 and 4 harbour the control function estimates. The probit estimates indicate that mobile has a significant positive effect on borrowing. Specifically, the findings reveal that mobile money users are 16.1 % more likely to borrow compared to non-users of mobile money. However, the probit estimates are susceptible to potential endogeneity bias. The non-significance of the generalised residual indicates no endogeneity in the borrowing function. As such, we consider that the probit estimates can be interpreted. These results are in line with Naito et al. (2021) who indicated that mobile money adoption increases the probability of saving in liquid asset and decreases the probability of saving in less liquid assets such as livestock. Mobile money platforms offer quick access to credit facilities by seamlessly incorporating microloans into their offerings. These services promote financial inclusion by enabling individuals who do not have access to traditional banking to participate in borrowing activities. In addition, using mobile money produces digital transaction records that can be employed to evaluate an individual's creditworthiness, thereby expediting the approval of loans. The reduced fees associated with transactions and the ease of borrowing through mobile money also incentivise users to utilise these alternatives.

Moreover, mobile money empowers consumers by providing them with enhanced authority over their financial assets, facilitating the effective administration of loans.

Finally, the perceived level of security and trust in mobile money platforms enhances user confidence in borrowing. These characteristics collectively increase the likelihood of borrowing among mobile money users compared to non-users.

Table 4. 5: Effect of Mobile Money Adoption on Borrowing Behaviour

	Probit estimates		Control function estimates	
	(1)	(2)	(3)	(4)
VARIABLES	Coeff	Marginal effects	Coeff	Marginal effects
Mobile money	0.482***	0.161***	0.555*	0.185*
	(0.134)	(0.0439)	(0.328)	(0.109)
Female	-0.00919	-0.00306	-0.0103	-0.00342
	(0.119)	(0.0396)	(0.119)	(0.0396)
Mobile money *female	-0.187	-0.0622	-0.186	-0.0620
	(0.173)	(0.0575)	(0.173)	(0.0575)
Age	0.0385**	0.0128**	0.0369**	0.0123**
	(0.0167)	(0.00552)	(0.0179)	(0.00593)
Age squared $x10^{-2}$	-0.0506**	-0.0169**	-0.0486**	-0.0162**
	(0.0203)	(0.00669)	(0.0218)	(0.0072)
Secondary	0.195*	0.0649*	0.183	0.0610
	(0.107)	(0.0356)	(0.118)	(0.0390)
Tertiary	0.0180	0.00599	-0.00517	-0.00172
	(0.160)	(0.0533)	(0.186)	(0.0619)
Middle income	0.273**	0.0911**	0.264**	0.0881**
	(0.128)	(0.0423)	(0.133)	(0.0441)
High income	0.188*	0.0628*	0.173	0.0577
	(0.102)	(0.0339)	(0.120)	(0.0398)
Urban	-0.115	-0.0383	-0.118	-0.0395
	(0.0910)	(0.0303)	(0.0921)	(0.0306)
workforce	0.162*	0.0539*	0.152	0.0506

	(0.0929)	(0.0308)	(0.102)	(0.0338)
Generalised residual			-0.0474	-0.0158
			(0.194)	(0.0646)
Constant	-0.627*		-0.609*	
	(0.323)		(0.331)	
Observations	1,000	1,000	1,000	1,000

Source: Computed by author using 2021 Global Findex Database and Stata 17. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

The findings suggest that there is no statistically significant difference between female and male in the probability of borrowing. Mobile money platforms ensure equal access to financial services for all genders, removing traditional obstacles frequently impeding women. Efficient financial inclusion policies and government initiatives foster a level playing field for borrowing. In addition, when there is a fair distribution of economic opportunities and greater gender equality, women are empowered to participate in financial activities on par with men. Mobile money services are created and promoted to be inclusive, ensuring they appeal to everyone, regardless of gender.

Results show that, the coefficient of the interaction term "mobile money*female" (-0.0620) and its standard error (0.0575) resulting in a t-value of around -1.08, which falls below the threshold for statistical significance. Thus, this indicates that although there is a slight decline in the probability of women borrowing through mobile money, this effect does not hold statistical significance. There is no substantial evidence to suggest that

mobile money usage has a varying effect on the likelihood of borrowing between men and women in this specific case.

The study findings equally suggest a correlation between an individual's age and their likelihood of borrowing. The probability of borrowing tends to increase as individuals get older, up until around the age of 38. After this age threshold, the likelihood of mobile money adoption decreases. This demonstrates a quadratic relationship between age and the individual's behaviour. . Several factors contribute to the quadratic pattern between age and borrowing probability among mobile money users. This pattern indicates an increase in borrowing until around the age of 38, followed by a decline. Younger and middle-aged individuals are more inclined to use mobile money due to their openness to innovation, higher income levels, and more significant financial management needs. They also tend to be more comfortable with technology. Based on the Technology Adoption Lifecycle and socioeconomic factors, middle-aged individuals benefit significantly from the convenience of mobile money. On the other hand, as individuals surpass the age of 38, borrowing rates tend to decrease due to factors such as the digital divide, increased apprehension towards technology, and a preference for more conventional banking practices. In addition, behavioural economics suggests that older individuals tend to prefer new technologies over established habits due to a status quo bias.

Findings further indicate that, individuals who have completed secondary education are 6.5 percentage points more likely to borrow. This indicates that secondary education significantly impacts the likelihood of borrowing, as it improves financial literacy, employment prospects, and income levels. On the other hand, tertiary education has no significant effect on the probability of borrowing. This could be because individuals with

higher education have other financial resources or have similar borrowing habits to those with lower educational levels.

Regarding the income class, results show that middle-income earners are 9.1 % more likely to borrow, whereas high-income earners are 6.3 % more likely to borrow compared to the low-income class. This could be because they have a greater need to finance different expenses or investments. However, individuals with higher incomes, although still more inclined to borrow than those with lower incomes, exhibit a slightly reduced likelihood. This could suggest their improved financial stability and ability to access other funding options. Income level plays a crucial role in shaping borrowing behaviour, emphasising the need for customised financial solutions that cater to the unique needs of various income groups.

Results indicate that those in the workforce have a 5.4 percentage point higher likelihood of borrowing compared to those who are not in the workforce. This implies that employed or actively participating in the workforce are more likely to borrow money. Possible factors contributing to this phenomenon include securing funding for diverse expenditures such as housing, education, or personal endeavours, which are more prevalent among gainfully employed persons.

Moreover, being employed might offer a more reliable source of income, making borrowing money for immediate or future financial needs more viable and appealing. This discovery emphasises the substantial impact of one's employment position on one’s borrowing habits.

4.4.2 Effect of Mobile Money on the Probability of Saving

This subsection aims to assess the effect of Fintech (mobile money) on the saving behaviour in Namibia while controlling for other correlates. Table 4.6 presents estimates of the structural saving function based on various assumptions. Columns 1 and 2 present the probit estimates while Columns 3 and 4 harbour the control function estimates. The probit estimates indicate that mobile money has a significant positive effect on savings. Specifically, the findings reveal that mobile money users are 18.9 % more likely to save than non-users of mobile money. However, the probit estimates are susceptible to potential endogeneity bias. The significance of the generalised residual indicates endogeneity in the savings function. The endogeneity bias is downward. The negative coefficient of -0.446 on the generalised residuals in the probit structural model of savings and mobile money adoption suggests a negative correlation between unobserved factors affecting mobile money adoption and savings. The probit model underestimates the actual effect of mobile money adoption on savings when endogeneity is not accounted for. By incorporating the generalised residuals, the model corrects this bias, resulting in a more precise estimate of the effect of mobile money adoption on savings behaviour. Indeed, the control function estimate shows that mobile money users are 86.8% more likely to save compared to non-users of mobile money. The findings align with those of Suri and Jack (2016) and Naito et al. (2021), showing that mobile money increases savings and borrowing capacities.

Table 4. 6: Effect of Mobile Money Adoption on Saving Behaviour

	Probit Estimates		Control Function Estimates	
	(1)	(2)	(3)	(4)
VARIABLES	Coef.	Marginal effects	Coef.	Marginal effects
Mobile money	0.591***	0.189***	2.880***	0.868***
	(0.134)	(0.0416)	(0.329)	(0.0879)
Female	-0.219*	-0.0701*	-0.283**	-0.0854**
	(0.121)	(0.0384)	(0.124)	(0.0372)
Mobile money*Female	0.161	0.0516	0.206	0.0621
	(0.175)	(0.0559)	(0.179)	(0.0538)
Age	0.0140	0.00448	-0.0338*	-0.0102*
	(0.0163)	(0.00523)	(0.0180)	(0.00539)
Age squared $x10^{-2}$	0.000703	0.0225	0.0607***	0.0183***
	(0.0195)	(0.00624)	(0.0216)	(0.0064)
Secondary	0.201*	0.0644*	-0.182	-0.0549
	(0.110)	(0.0349)	(0.123)	(0.0368)
Tertiary	0.579***	0.186***	-0.150	-0.0452
	(0.175)	(0.0553)	(0.203)	(0.0610)
Middle income	0.357***	0.114***	0.0762	0.0230
	(0.127)	(0.0400)	(0.134)	(0.0405)
High income	0.504***	0.162***	0.0353	0.0106
	(0.102)	(0.0314)	(0.121)	(0.0363)
Urban	0.0849	0.0272	-0.0242	-0.00730
	(0.0925)	(0.0296)	(0.0957)	(0.0288)
workforce	0.331***	0.106***	0.0206	0.00620
	(0.0931)	(0.0293)	(0.104)	(0.0313)
Generalized residual			-1.480***	-0.446***
			(0.193)	(0.0532)
Constant	-1.157***		-0.612*	
	(0.326)		(0.341)	

Observations	1,000	1,000	1,000	1,000

Source: Computed by author using the 2021 Global Findex Database and Stata 17. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

Results also indicates a statistically significant difference between men and women in terms of savings. Specifically, women are 8.5% less likely to save compared to men. This is based on the idea that men tend to receive larger salaries, experience more consistent job opportunities, and enjoy better availability of official financial resources, which allows them to accumulate greater savings. Conversely, women frequently encounter reduced income because of disparities in wages, engaging in part-time or unofficial work, and assuming a greater load of domestic and childcare duties, all of which restrict their ability to save. The interaction term "mobile money*female" coefficient is non-significant, suggesting that that the effect of mobile money on savings does not differ between men and women. Results indicate that the age of the individual associates negatively with the saving behaviour while age squared positively associates with the saving behaviour, thus exhibiting a convex quadratic behaviour. These findings confirm the non-linearity of the relationship between saving behaviour and age of the individual.

4.4. Effect of Mobile Money adoption on the probability of financial behaviour by Gender

This subsection aims to assess the effect of Fintech (mobile money) adoption on financial behaviour in Namibia while controlling for other correlates by gender. Based on the idea that, the generalised residual was not significant in borrowing function estimation under the Control function approach, the probit estimates were preferred. In this light, we present

but the probit estimates by gender. Columns 1 and 2 present the coefficients and the marginal effect of the probit estimates for the men subsample while Columns 3 and 4 harbour the coefficients and marginal effects of probit estimates for the women subsample. The results indicate that male users of mobile money are 14.7% more likely to borrow compared to male non-users of mobile money. Similarly, female users of mobile money are 12.8% more likely to borrow compared to female non-users of mobile money.

Table 4.7: Probit Estimate of Effect of Mobile Money on Borrowing Behaviour

	Men Subsample		Women subsample	
	(1)	(2)	(3)	(4)
VARIABLES	Coef.	Marginal eff.	Coef.	Marginal eff.
Mobile money	0.443***	0.147***	0.357***	0.128***
	(0.153)	(0.0507)	(0.132)	(0.0474)
Age	0.0629**	0.0209**	0.0190	0.00682
	(0.0294)	(0.00979)	(0.0217)	(0.00780)
Age squared x 10^{-2}	-0.0814**	-0.0270**	-0.0277	-0.00997
	(0.0362)	(0.0120)	(0.0258)	(0.00928)
Secondary	0.396**	0.131**	0.0509	0.0183
	(0.167)	(0.0555)	(0.149)	(0.0536)
Tertiary	0.254	0.0844	-0.113	-0.0407
	(0.267)	(0.0888)	(0.216)	(0.0778)
Middle income	0.0789	0.0262	0.414**	0.149**
	(0.222)	(0.0737)	(0.178)	(0.0638)
High income	-0.0135	-0.00448	0.293**	0.105**
	(0.174)	(0.0576)	(0.142)	(0.0512)
Urban	0.108	0.0358	-0.284**	-0.102**
	(0.135)	(0.0449)	(0.129)	(0.0462)
Workforce	0.180	0.0599	0.164	0.0589

	(0.152)	(0.0506)	(0.124)	(0.0446)
Constant	-1.142**		-0.220	
	(0.527)		(0.410)	
Observations	445	445	555	555

Source: Computed by author using 2021 Global Findex Database. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Results also show that for the men subsample, age depicts a concave quadratic relationship with borrowing. Indeed, the likelihood of borrowing among men tend to increase to rise as people age, reaching their peak around the age of 39 and beyond this threshold, the probability of borrowing among men starts decreasing.

Table 4.8 presents the Control function estimates of the effect of mobile money on saving by gender. Specifically, Columns 1 and 2 display respectively the coefficients and marginal effects of Control function estimates for the men subsample, whereas Columns 3 and 4 presents the coefficients and marginal effects of control function estimates for the women subsample. The results suggest a significant positive influence of mobile money on saving, differentiated by gender. The findings indicate that male mobile money users are 70% more likely to save compared to their counterpart that are not using mobile money services. Among the women subsample, findings indicate that female users of mobile money services are 99.6% more likely to save compared to female non-users of mobile money services. This is an indication that the effect of mobile money on saving behaviour is stronger among women compared to men.

Table 4. 7: Control Function Estimate of Effect of Mobile Money on Saving Behaviour

	Men Subsample		Women Subsample	
	(1)	(2)	(3)	(4)
VARIABLES	Coeff.	Marginal eff.	Coeff	Marginal eff.
Mobile money	2.379***	0.700***	3.301***	0.996***
	(0.491)	(0.132)	(0.426)	(0.108)
Age	-0.0184	-0.00541	-0.0409*	-0.0123*
	(0.0301)	(0.00884)	(0.0234)	(0.00701)
Age squared $x10^{-2}$	0.0334	0.0982	0.0748***	0.0226***
	(0.0368)	(0.0108)	(0.0280)	(0.00828)
Secondary	-0.140	-0.0411	-0.176	-0.0530
	(0.182)	(0.0534)	(0.170)	(0.0510)
Tertiary	0.577	0.170	-0.401	-0.121
	(0.403)	(0.118)	(0.255)	(0.0765)
Middle income	-0.0232	-0.00684	0.193	0.0581
	(0.204)	(0.0601)	(0.180)	(0.0542)
High income	0.166	0.0489	-0.0335	-0.0101
	(0.183)	(0.0537)	(0.162)	(0.0489)
Urban	0.0636	0.0187	-0.0728	-0.0220
	(0.144)	(0.0422)	(0.131)	(0.0396)
workforce	0.123	0.0361	-0.0245	-0.00738
	(0.157)	(0.0462)	(0.141)	(0.0426)
Generalised residual	-1.223***	-0.360***	-1.582***	-0.477***
	(0.303)	(0.0839)	(0.256)	(0.0696)
Constant	-0.748		-0.870**	
	(0.526)		(0.437)	
Observations	445	445	555	555

Source: Computed by author using 2021 Global Findex Database and Stata 17. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

Results also show that among women, the probability of saving decreases with age, peaking at approximately 27 years old. Upon reaching this age threshold, the likelihood of saving starts diminishing. This demonstrates a quadratic relationship between age and an individual's propensity to saving.

CHAPTER FIVE: CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the conclusions and policy recommendations based on the study objectives, providing insights into the effect of Fintech on financial behavior in Namibia overall and by gender. Following the analysis of empirical data in Chapter Four, this chapter draws conclusions, evaluates research objectives, and offers practical policy recommendations that can enhance Fintech adoption and its impact on financial inclusion.

5.2 Conclusions

Mobile money services have emerged as a key tool for enhancing financial inclusion, allowing a large segment of the population to access financial services that were previously unavailable or difficult to obtain through traditional banking systems. The ease of access, convenience, and affordability offered by mobile money platforms have empowered individuals to engage in financial activities such as saving and borrowing, which is essential components of personal financial management and economic participation.

This study investigated the effect of Fintech on financial behaviour in Namibia while considering the gender perspective. Specifically, the study examined the gender disparity in mobile money adoption in Namibia and assessed the extent of the effect of mobile money adoption on saving and borrowing behaviour. The study used the 2021 Findex data for Namibia collected by the World Bank and employed the Probit model to analyse gender disparity in mobile money adoption and the Control Function modelling to examine the effect of mobile money adoption on saving and borrowing behaviour.

The findings indicate no significant gender disparity in the adoption of mobile money services in Namibia. Both men and women have equal access to and usage of Fintech services, driven by financial policies aimed at inclusive growth. The absence of gender disparity suggests that the design and accessibility of Fintech services are inherently gender-neutral and are equally available to both genders. The results demonstrate that mobile money users are more likely to save and borrow compared to non-users. This finding is consistent across both genders, indicating that Fintech has a positive effect on financial behavior in Namibia. The study suggests that mobile money services facilitate better financial management, providing users with opportunities to increase savings and access credit, thereby promoting financial stability and economic participation.The research highlights the importance of Fintech as a driving force for economic development in Namibia. By providing accessible, efficient, and affordable financial services, mobile money platforms have enabled individuals to engage in the formal financial sector, thereby reducing poverty and enhancing economic opportunities. This contributes to greater financial stability, not only at the individual level but also within the broader economy. As more individuals gain access to savings and credit, the financial system becomes more robust and capable of supporting sustainable development. Overall, the findings suggest that Fintech, through its capacity to promote financial inclusion and improve financial behavior, holds immense potential for further economic development in Namibia. Policymakers and financial institutions should continue to support the growth of Fintech by creating an enabling environment that addresses barriers such as income inequality and educational disparities. Moreover, targeted interventions, such as financial

literacy programs and infrastructure development in rural areas, will be critical in ensuring that Fintech's benefits are shared equitably across all segments of the population.

5.3 Policy Recommendations

To maximize the benefits of Fintech and address existing challenges, the following policy recommendations are proposed:

5.3.1 Enhancing Digital Infrastructure

- The government should prioritize the expansion of digital infrastructure, including mobile networks and internet penetration, especially in rural areas.
- Public and private sector investments in broadband connectivity should be incentivized to ensure widespread access to digital financial services.
- Policies should encourage mobile network operators to develop affordable data packages tailored to low-income groups, ensuring cost-effective access to digital financial platforms.

5.3.2 Strengthening Public-Private Collaboration

- Government agencies should collaborate with Fintech companies to establish regulatory frameworks that balance innovation with consumer protection.
- Public-private partnerships (PPPs) should be leveraged to promote Fintech adoption through targeted digital literacy programs and financial education campaigns.
- The government should create an enabling legal and regulatory environment that encourages competition among Fintech providers while ensuring robust cybersecurity measures.

5.3.3 Promoting Financial Literacy and Inclusion

- Financial literacy programs should be implemented to target individuals with lower educational backgrounds, helping them understand and effectively use digital financial services.
- Policymakers should develop awareness campaigns to educate the public on the benefits and risks of mobile financial services, fostering informed financial decision-making.
- Special initiatives should be introduced to support marginalized groups, including women, rural populations, and low-income individuals, in accessing and using Fintech solutions.

5.3.4 Encouraging Fintech Innovation and Market Expansion

- The Bank of Namibia should facilitate regulatory sandboxes that allow Fintech firms to test new products and services in a controlled environment before full-scale deployment.
- Policies should be designed to attract foreign investments in Namibia's Fintech sector, fostering technological advancements and cross-border financial collaborations.
- Financial institutions should be encouraged to integrate digital payment solutions and mobile money services into their offerings to promote greater financial accessibility.

5.3.5 Ensuring Consumer Protection and Cybersecurity

- Strengthening regulations to ensure secure digital financial services is essential to building public confidence in Fintech platforms.

- The government should implement cybersecurity frameworks that safeguard users' financial data and transactions from fraud and cyber threats.
- Consumer protection policies should be reinforced to address potential risks associated with digital financial services, ensuring transparency and accountability among Fintech providers.

5.4 Areas for Further Research

Future research could focus on:

- Longitudinal studies using panel data to assess the long-term impact of mobile money services on financial behaviours such as saving, borrowing, and spending.
- Impact assessment of digital infrastructure development on Fintech adoption, particularly in rural and underserved areas.
- Evaluating the effectiveness of financial literacy programs and their role in enhancing Fintech adoption and usage across different demographic groups.
- Exploring the transition dynamics of mobile money usage, investigating how individuals move from occasional to frequent users and the associated factors influencing this shift.

By addressing these research areas and implementing the recommended policies, Namibia can fully leverage the potential of Fintech to drive financial empowerment and inclusive economic growth for all its citizens.

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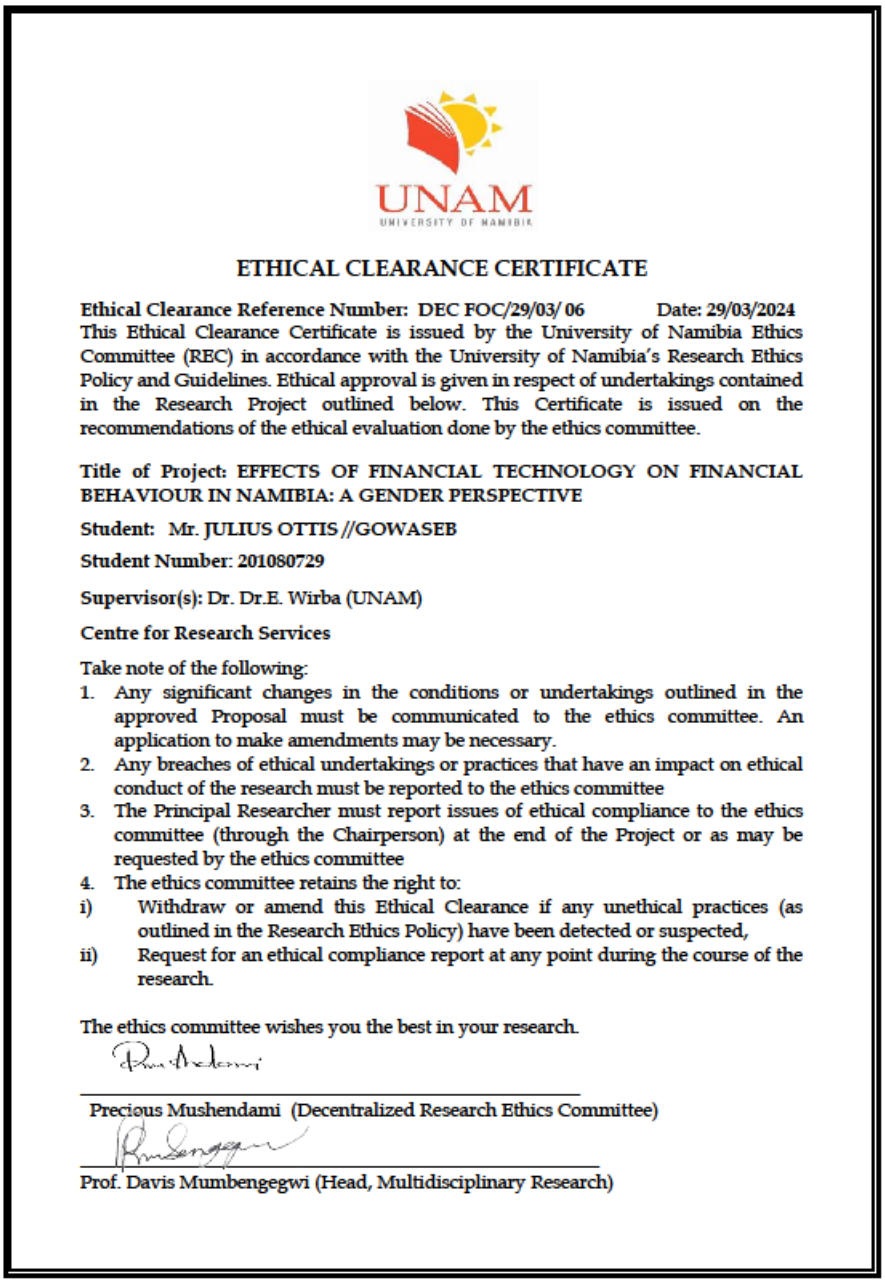
Appendix: Ethical clearance certificate



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ETHICAL CLEARANCE CERTIFICATE

Ethical Clearance Reference Number: DEC FOC/29/03/ 06 **Date: 29/03/2024**

This Ethical Clearance Certificate is issued by the University of Namibia Ethics Committee (REC) in accordance with the University of Namibia's Research Ethics Policy and Guidelines. Ethical approval is given in respect of undertakings contained in the Research Project outlined below. This Certificate is issued on the recommendations of the ethical evaluation done by the ethics committee.

Title of Project: EFFECTS OF FINANCIAL TECHNOLOGY ON FINANCIAL BEHAVIOUR IN NAMIBIA: A GENDER PERSPECTIVE

Student: Mr. JULIUS OTTIS //GOWASEB

Student Number: 201080729

Supervisor(s): Dr. Dr.E. Wirba (UNAM)

Centre for Research Services

Take note of the following:

1. Any significant changes in the conditions or undertakings outlined in the approved Proposal must be communicated to the ethics committee. An application to make amendments may be necessary.
2. Any breaches of ethical undertakings or practices that have an impact on ethical conduct of the research must be reported to the ethics committee
3. The Principal Researcher must report issues of ethical compliance to the ethics committee (through the Chairperson) at the end of the Project or as may be requested by the ethics committee
4. The ethics committee retains the right to:

i) Withdraw or amend this Ethical Clearance if any unethical practices (as outlined in the Research Ethics Policy) have been detected or suspected,

ii) Request for an ethical compliance report at any point during the course of the research.

The ethics committee wishes you the best in your research.

Precious Mushendami (Decentralized Research Ethics Committee)

Prof. Davis Mumbengegwi (Head, Multidisciplinary Research)