SD DOMBO UNIVERSITY OF BUSINESS AND INTEGRATED DEVELOPMENT STUDIES

EXAMINING THE LINKAGES BETWEEN MOBILE MONEY SERVICES, DIGITAL INCLUSION AND ADVERSE DIGITAL INCORPORATION IN GHANA

BY

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A THESIS SUBMITTED TO THE DEPARTMENT OF ACCOUNTING, SD DOMBO UNIVERSITY OF BUSINESS AND INTEGRATED DEVELOPMENT STUDIES (UBIDS) IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF AN MPHIL IN MANAGEMENT INFORMATION SYSTEMS

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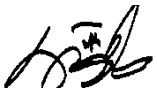
DECLARATION

I, **NOUTERAH LOUIS**, do hereby declare that this work is the result of my own research and has not been presented by anyone for any academic award in this or any other University. All references used in the work have been fully acknowledged. I am solely responsible for any shortcomings in this work.



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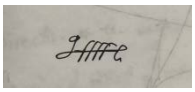
CERTIFICATION

I hereby certify that this thesis was supervised in accordance with procedures laid down by the University.

Signature  11/09/2023

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DEDICATION

I dedicate this entire work to God and to my parents - Mr. and Mrs. Nouterah.

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I would like to begin by thanking the Almighty God for His direction and protection during my two years at SDD University of Business and Integrated Development Studies.

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ABSTRACT

The role of mobile money services in the achievement of digital inclusion is profound, especially in developing countries. While evidence in the literature points to the role of mobile money services in achieving digital inclusion, mobile money services have created an opportunity for the most vulnerable to be digitally exploited leading to adverse digital incorporation. Despite this, extant research has concentrated on the benefits of mobile money services for ensuring digital inclusion thereby ignoring the exploitative avenues it creates for many. Again, this study is being carried out to understand and examine the linkages between mobile money services, digital inclusion and adverse digital inclusion, which has greatly been ignored by previous researchers.

The relationship between mobile money services, adverse digital incorporation, and digital inclusion has not received enough attention from information systems researchers. This work fills this gap by employing partial least squares structural equation modeling to analyze survey data gathered from users of mobile money services in Ghana and the capability approach as the theoretical lens.

The study examines the mediating role of digital inclusion on the effect of mobile money services on adverse digital inclusion. Findings reveal that more than 80% of the working population in Ghana use mobile money services, however, this has created a large pool of opportunities for digital exploitation.

The study provided some implications for research practice and policy that could aid in curbing or reducing digital exploitation. In addition, this study recommends the government to ensure that network service provides heed to the laws governing subscriber privacy to ensure the that personal details and the privacy of subscribers are not tempered with. The government must also regulate

and levy taxes fairly on digital systems to prevent subscribers from feeling exploited. With regards to research, this study adds to literature in the field of research on mobile money usage, digital inclusion and adverse digital incorporation.

The study deepens the discourse on the linkages between mobile money services, digital inclusion and adverse digital inclusion by understanding the extent to which the use of mobile money services may lead to people being digitally exploited. The findings from the study revealed that every subscriber using mobile money is at a risk of being digitally exploited. In addition, it was revealed that digital inclusion has a positive influence on adverse digital incorporation.

LIST OF ABREVIATIONS

ADI	Adverse Digital Incorporation
ATM	Automated Teller Machine
AVE	Average Variance Extracted
CB-SEM	Covariance Based-Structural Equation Modelling

DI	Digital Inclusion
DOI	Diffusion of Innovations
GOF	Goodness of Fit FinTech Financial Technology
HW	Hardware
HTMT	Heterotrait-Monotrait Ratio
ICT	Information and Communication Technology
IS	Information Systems MoMo Mobile Money
OS	Operating System
PLS-SEM	Partial Least Squares - Structural Equation Modelling
PIN	Personal Identification Number
SEM	Structural Equation Modelling
SRMR	Standardized Root Mean Squared Residual
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor

Contents

LIST OF FIGURES

LIST OF TABLES

CHAPTER ONE

INTRODUCTION

Background

Individuals with access to digital financial services have the opportunity to pay, get paid and improve their quality of life (Demirgüç-Kunt, Klapper & Ansar, 2018). Globally there are many digital financial services, some of which are electronic banking (e-banking), mobile money services, block chain for cryptocurrencies, amongst others. In Ghana, mobile money (MoMo) services stand out as the most used digital financial service (Cobla & Osei-assibey, 2018).

The usage of MoMo services has become rampant in Ghana (Akomea-frimpong, Jin, & Osei-Kyei, 2020), this is due to individuals adopting this technology to be digitally included. Mobile money is a service that keeps money in a secure electronic account linked to a mobile phone number (Ahmad, Green & Jiang, 2020). Mobile money is essentially a type of electronic money that does not necessitate the use of a computer or an internet connection (Kernan, 2021). With this service, users can store, send, and receive money using their mobile phones. The efficiency and reliability of mobile money services for financial transactions have influenced most individuals in Ghana to adopt and use the service (Akomea-Frimpong et al., 2020).

The increase in MoMo usage demonstrates the critical role that technology is playing in advancing the Central Bank Cash-light Economic Agenda, as well as ensuring that the push for greater financial inclusion reaches millions of Ghanaians. Currently, there are three telecommunication service providers that offer mobile money services to their customers (Akomea-frimpong et al., 2020). They are: Mobile Telecommunications Network (MTN), Vodafone and AirtelTigo. MTN is the most used mobile money service provider, since it has a large customer base. Subscribers in Ghana have found it relatively simple to open mobile money accounts (Akomea-frimpong, Andoh

& Dwomoh-Okudzeto, 2020). As a result, it has proven to be more successful than the Bank of Ghana's e-zwich for branchless banking. To open a mobile money account, a customer must first obtain a registered cell phone SIM card from the mobile network operator providing the service and then register for a mobile money account (Akomea-frimpong, Andoh & Dwomoh-Okudzeto, 2020). The customer can then make cash deposits at any of the operator's mobile money agents' or partner banks' offices.

Retail outlets are important for mobile money transactions as they are used to open accounts, exchange cash for balances in the system and vice versa (Lashitew et al., 2019). The retailer acts as the customer interface for users and the mobile money system and earns a small commission to facilitate each transaction. In most cases, customers bring cash to the store to open an account or transfer money (Lashitew et al., 2019). Retailers receive cash and transfer it from their accounts to their customers' accounts. When a customer requests cash from their account, the retailer transfers funds from the customer's account to theirs and gives the customer the cash. Retailers are typically required to maintain accounts with traditional financial institutions, whose transaction volume and frequency limits are greater than those of individual customers (Akomea-frimpong, Andoh & Dwomoh-Okudzeto, 2020).

Mobile money services give those who previously only had access to ineffective informal financial services access to the official financial system, which is a crucial component of economic growth. By safely and securely holding and transferring money on a mobile device, customers avoid the hazards connected with doing so in person, such as robbery, fraud, police corruption, unintentional fires or infestations, and major currency devaluation (Kernan, 2021).

The activities required to ensure that all individuals and communities, including the most vulnerable, have access to and use of information and communication technologies (ICTs) may be

referred to as digital inclusion (Robinson et al., 2020). Having access to ICTs does not mean the individual is digitally included, the person should be able to use this technology for its intended purpose. In this study, individuals with access to mobile money services and making use of it, are those considered to be digitally included.

Adverse digital incorporation is defined as inclusion into digital systems that allow wealthier groups to derive disproportionate value from the labor and resources of less wealthy groups (Heeks, 2020). In addition, adverse digital incorporation may be narrowed as exploitation in the sense of one group extracting value from the efforts of others.

The use of mobile money services has become essential for making financial transactions. These transactions can be between customer to customer and service provider to customer. With the individual being digitally included through the use of mobile money services, adverse digital incorporation grows and takes advantage of this opportunity (Heeks, 2020a). The use of mobile money services provides grounds for the exploitation of users based on some form of taxes. More than half of Ghana's population are digitally included through the use of mobile money services. Due to this, the government may decide to tax these services at a higher rate and consumers of these services will have no choice but to accept these charges because they want to be digitally included. The government and services providers are the main regulators and providers of the mobile money services in Ghana (Lashitew et al., 2019). This means, transaction fees charged and taxes levied on mobile money transactions are initiated only by government and the service providers. These fees and taxes are mandatory as longs a Ghanaian or subscriber wants to use the service. The only way this can be avoided is not using the mobile money service at all, and in the long run creating a digital divide. On the other hand, the government and services providers are

presented a gold opportunity to take advantage or exploit of Ghanaians or subscribers who want to be digitally included on the network.

Research Problem

Over the past ten years, mobile money usage has increased dramatically in numerous countries worldwide, particularly in several developing nations (Ismail et al., 2017). In Ghana, mobile money services stand out as the most used digital financial service (Cobla & Osei-assibey, 2018). Mobile money is essentially a type of electronic money that does not necessitate the use of a computer or an internet connection (Kernan, 2021). Our daily lives have been continuously altered by mobile money's interesting and beneficial services, which allow users to pay for goods and services wherever they go, withdraw and deposit money using their phones, use mobile banking, and purchase airtime top-ups (Ismail et al., 2017). Due to the reliability and efficiency of mobile money services, most Ghanaians find Momo to be the best in terms of digital financial services (Allen, Science & Yu, 2019). Again, the efficiency and dependability of mobile money services for financial transactions have persuaded the majority of Ghanaians to adopt and use the service (Akomea-frimpong et al., 2020).

Individuals with access to a digital system and are making use of it are considered to be digitally included (Robinson et al., 2020). Having the needed ICTs like a mobile phone and a registered

SIM card gives the user the opportunity to make use of MoMo services and enjoy all its benefits. The benefits a user enjoys as a result of using MoMo is the main factor behind its increased use (Allen et al., 2019). The widespread adoption and usage of mobile money services has been fueled by the immense opportunities they provide for individual and national development. As a result, the use of mobile money services is now seen as a basic utility equivalent to electricity, water, and gas (Ozili, 2018). Past literature presents evidence on the need to be digitally included, however the need to be digitally included gives room for adverse digital incorporation.

An inclusion in a digital system that allows a more affluent group to extract disproportionate value from the work or resources of a less affluent group is known as adverse digital incorporation (Heeks, 2020a). With majority of Ghanaians using MoMo, it presents an opportunity for extortion and many other unwarranted deductions (Akomea-frimpong et al., 2020).

Past literature presents proof of mobile money services bridging the digital divide through digital financial inclusion (Serbeh et al., 2021). However, researchers have overlooked the complications associated with the use of mobile money services. The effect of digital inclusion on adverse digital inclusion among mobile money users has been given less attention in research. The effects of digital inclusion with regards to mobile money users on adverse digital inclusion has been less explored (Heeks, 2020a). Conducting this research will help broaden the knowledge on the complications associated with MoMo services and the effect of digital inclusion on adverse digital inclusion. Hence there is a need to examine and the linkages and effects of digital inclusion on adverse digital inclusion among mobile money users.

Research Purpose

The purpose of this study is to understand and examine the linkages between mobile money services, digital inclusion and adverse digital inclusion, with reference to the gaps identified in literature regarding the use of mobile money services, digital inclusion and adverse digital incorporation.

Research Objective

The following objectives have been developed to guide the research:

1) To understand the effects of mobile money adoption on digital inclusion and digital adverse incorporation.
2) To understand the effects of digital inclusion on adverse digital inclusion.
3) To understand the mediating effect of Digital Inclusion on the nexus between mobile money adoption and Adverse Digital Incorporation

Research Questions

This research seeks to examine and achieve its objective by empirically investigating these research questions below.

1. What are the effects of mobile money adoption on digital inclusion and digital adverse incorporation?
2. What are the effects of digital inclusion on Adverse Digital Incorporation?
3. What is the mediating effect of Digital Inclusion on the nexus between mobile money adoption and Adverse Digital Incorporation?

Significance

This study makes key contributions to research, practice and policy. Previous studies have mostly examined the connection between mobile money services and digital inclusion. In research, this study examines the links between mobile money services, digital inclusion and adverse digital incorporation. Unlike other research, this study will specifically show the relationship between mobile money service and digital inclusion, mobile money services and adverse digital incorporation, and digital inclusion and adverse digital incorporation in a developing country context. This study therefore adds to the limited literature in this area of mobile payments research. Also, this research will contribute to new knowledge in the field of information systems (IS), and deepen the discourse on the linkages between mobile money services, digital inclusion and adverse digital inclusion. Practically, this research will identify and examine the effects of adverse digital incorporation on mobile money users who are digitally included on these networks. This study will help citizens make informed decisions in the case of adoption and use in the future. With regards to policy, since this study also seeks to examine the negativity of adverse digital inclusion and how it can be curbed. Policies are recommended to the government on how adverse digital incorporation can be curbed.

Chapter Outline

This study is organized in five chapters. The first chapter provides the introduction to the study, problem of the research, the objectives of the study, the questions that the study seeks to provide answers to base on the research objectives and significance of the study.

The second chapter explores the Literature review. Both theoretical and empirical literature is reviewed. The concepts of mobile money, digital inclusion and adverse digital incorporation shall be discussed. The researcher develops the conceptual framework for the study for the purposes of analyzing and examining the subject matter to be investigated. Theory and Hypothesis development is also captured in this chapter.

Chapter three captures the research methodology that will be employed in the study. This involves the techniques and instruments that shall be used to carry out the data collection.

Chapter four entails the analysis and presentation of the data collected. Thus this chapter presents and discusses all findings based on the objectives of the study and the evidence presented in the empirical and theoretical literature using Partial Least Squares–Structural Equation Modeling (PLS-SEM).

Chapter five serves as the last chapter. This chapter includes a summary, a conclusion, and suggestions. The study's goals, main discoveries, and research results are all outlined in this chapter.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter is organized into four main sections. A review of relevant literature on FinTech, particularly, an overview, the definition of concepts, and FinTech innovations is the first part. The second part entails a review of Mobile Payment services. This includes the definition, and nature of mobile money payments in Ghana (Mobile Money, Internet banking and Mobile banking). The third part is a review that focuses on digital inclusion (i.e., definition, the digital divide, digital inclusion and quality of life and mobile money). The final part contains a review of the literature on adverse digital incorporation.

2.1 Mobile Payment Services

In the past ten years, mobile payment has grown widely utilized and has even become a necessity for performing financial transactions (Karsen, Chandra & Juwitasary 2019). Many academics in the field of information systems (IS) have defined mobile payments. However, considering the diverse definitions from earlier research, it is critical to examine the applicability of the present concept of mobile payment systems. According to Jung, Kwon & Kim (2020), service that enables customers to start, approve, and finish financial transactions involving the transfer of money over a mobile network or wireless communication technologies using a mobile device is known as mobile payment.

To ensure the safety and comfort of every transaction, mobile devices can be used for payment (as a mobile payment) using micro-payment methods that must be enabled by an authentication system (Karsen et al., 2019). There are various benefits to using the mobile payment method, which is an independent payment that is conveniently accessible anywhere and avoids the likelihood of long lines due to cash payments. In addition to the benefits, there are various factors that can discourage the adoption of mobile payment methods, such as payment system premiums, perceived security threats, incompatibility with big payments, and mobile payment immunity (Chen & Robinson, 2019).

The mobile payment market has been dubbed the fastest growing FinTech services sector since it allows for the simple movement of money from one person to another at any time and from anywhere (Leng, Talib & Gunardi, 2018). According to Mobile Payments App Revenue and Usage Statistics (2022), mobile payment adoption is expected to reach 4.8 billion by 2025. In 2021, Over two billion people used mobile payments. As a result, mobile payments transaction volume reached $1.7 billion in 2022, a 27% annual increase but is expected to slow down in 2023 Furthermore, Sub-Saharan Africa is regarded as the world's third fastest growing region in terms of mobile phone subscribers. The sub-Saharan section of the African continent heavily relies on mobile payments, with 548 million registered accounts across 157 providers (Mobile Payments App Revenue and Usage Statistics, 2022).

2.2 Categories of mobile payment services

There are five main categories of mobile payment services. Table 2.1 below gives details about these categories and some examples.

Table 2.1 Categories of Mobile Payment Services

Category Definition	**Examples**
Mobile Wallet Tech: A mobile wallet is a digital version of a physical wallet that enables users to store card information securely on their mobile devices.	Apple Pay, Google Pay, Samsung Pay,
Mobile Peer-to-Peer Payments: P2P payments provide a digital platform that enables individuals to transfer funds directly to each other using their mobile devices.	Venmo, PayPal, Cash App, Zelle
Mobile E-commerce: This enables consumers to buy goods or services directly from their mobile devices. It also eliminates the need for physical transactions.	Mobile Banking, MTN Mobile Money, Vodafone Cash, Amazon Hub Counter
Mobile Point of Sale System: This functions as a portable, compact payment terminal. It enables businesses to accept card payments.	Shopify, Lightspeed, Vend
SMS Payments: This form of payment leverages the ubiquity of text messaging to	Text to Pay

conduct financial transactions. To make payments, users send a text message containing specific instructions to a premium rate SMS number associated with their service provider. The amount is either added to their monthly phone bill or deducted from their prepaid balance.	

Source: Author's Construction

2.3 Mobile payment services in developing countries

In developing nations, mobile payments have become a crucial instrument for boosting financial inclusion. By enabling consumers to perform financial transactions using their mobile devices, mobile payments can assist in removing the obstacles that traditional banking systems present to financial inclusion (Ahmad, Green, & Jiang, 2020).

Since many financial services in emerging nations are pricey, many of the most impoverished people cannot get bank accounts. However, by enabling people to send and receive money via their phones, the expansion of mobile payment systems has been viewed as a means of boosting access (Kernan, 2021). While a lot of study has been done on the advantages of "mobile money," comparatively little academic research has been done on the companies that offer these services and how successful they are, this can however be tackled by future researchers in field of IS. However, M-Pesa, Orange Money, MTN Mobile Money, and Airtel Money have millions of customers throughout Africa and are among the best mobile money services accessible in Africa (Batista & Vicente, 2021). According to Meetanshi (2024), the global mobile payment market is valued at It is expected to grow at a CAGR of 36.2% between 2023 to 2030.

2.3.1 Mobile Payments Challenges in Developing Nations

Although mobile payments provide several benefits, their widespread adoption in underdeveloped nations will require overcoming a number of obstacles. Among the most common obstacles are:

Infrastructure

Both mobile network infrastructure and a reliable internet connection are required for mobile payments. Many developing countries do not currently have these infrastructural needs in place, which makes it challenging for people to conduct mobile payments (Aron, 2018).

Digital Literacy

Using mobile payment services requires a certain amount of digital literacy from users. This might be challenging in developing countries when a large portion of the populace lacks familiarity with digital technologies (Fang et al., 2019).

Security

Although, overall, mobile payments are more secure than cash transactions, fraud and other security issues can still arise with them. This is particularly true in developing countries, where there may be less robust cybersecurity safeguard (Akomea-frimpong et al., 2020).

Regulatory Setting

Countries have very different mobile payment regulatory environments. In order to promote the usage of mobile payments in developing nations, a stable and well-defined regulatory framework must be established (Martin, 2019). However most of these developing nations do not have these bodies set up.

2.3.2 Mobile Payment Opportunities in Development Countries

Mobile payments provide various prospects for developing nations, nevertheless the obstacles. Among the main opportunities are:

Inclusion in Finance

By providing individuals with access to financial services they may not have previously had, mobile payments can aid in the promotion of financial inclusion (Ahmad, Green, & Jiang, 2020). This might lead to both economic development and a decrease in poverty.

Innovation

Since mobile payments are a relatively new technology, there are lots of room for advancement (Okello Candiya Bongomin & Ntayi, 2020). Peer-to-peer payments, micro lending, and other innovative financial services, for instance, may be made possible via mobile payment systems (Giglio, 2021).

Economic Development

Mobile payments can aid in the expansion of the economy by streamlining transactions and reducing the expenses related to conventional payment systems (Ahmad, Green, & Jiang, 2020). This may promote entrepreneurship and increase market efficiency.

Social Implications

Mobile payments can have a big societal impact in poor nations. Mobile payment systems have the potential to improve the provision of social welfare benefits, such cash transfers or food subsidies, to individuals who are in need (Jung et al., 2020).

2.4 Nature of Mobile Payments in Ghana

Among all the FinTech categories in table 2, mobile transactions are the most used in Ghana. This is because more than 90% of mobile phone users in the country use one or more mobile payment

services (Kwabena, Mei, Ghumro, Li & Erusalki, 2021). This study focuses on this category, since it identified as a technology that facilitate payments via mobile wireless devices, such as smartphones, tablets and the like. It clearly relates to the use of mobile money services to bridge the digital divide and increase the quality of life (Fang, Canham, Battersby, Sixsmith & Wada, 2019).

Scholars and industry experts have recognized mobile payment as a very good opportunity to stair economic growth and development, as well as present opportunities to citizens in resource-poor environments who do not have bank accounts, thereby assisting developing countries in providing financial security (Humbani & Wiese, 2018; Mothobi & Grzybowski, 2017; Peruta, 2018). Mobile payment services, such as Mobile Money (MoMo), Mobile Banking, and Internet banking, have significantly changed the manner that financial services are delivered in Ghana (Bank of Ghana, 2018). Mobile payments represent a new kind of commerce with unique qualities not seen in conventional payment systems, such as ubiquity, personalization, flexibility, and localization (Aithal, 2016; Liébana-Cabanillas, Muoz-Leiva, & Sánchez-Fernández, 2018). As a result, they present potential for various capabilities and applications that benefit customers more (Boateng, Afeti & Afful-Dadzie 2019).

2.4.1 Internet Banking

Internet banking is described as an electronic system that provides consumers with a variety of simple and cost-effective channels for integrated online banking services. It includes online account checks and deposits, insurance, mortgages, and other financial services (Giglio, 2021). Customers of a bank can utilize internet banking at their leisure to do the same financial

transactions as a physical branch (Karsen et al., 2019). However, unlike MoMo and Mobile Banking in Ghana, Internet Banking has lately experienced a decrease in the number of registered users and transaction volume (BoG - Payment System Report, 2023).

Table 2.2 shows the volume of internet banking transactions and the value of transactions within the years 2020 to 2023.

Table 2.2 Internet Banking

Internet Banking	**2020**	**2021**	**2022**	**2023**
Volume of transactions	7,055,793	9,077,471	6.9 billion	9.2 billion
Value of transactions (GH¢)	24,208,653,	56,237,587,	880,000,000	1,185,000,000

Source: Bank of Ghana Annual Report (2023)

2.4.2 Mobile Banking

With the introduction of mobile technology and phones, mobile banking has become a popular concept because it combines traits such as ease, ubiquity, and interactivity (Karsen et al., 2019). Individuals can now conduct banking services at their leisure and connect to these services conveniently and swiftly utilizing their mobile devices (Leng et al., 2018). The first banks in Ghana to be granted authorization to implement mobile banking solutions were the First National Bank (FNB) and the Ghana Commercial Bank (Bank of Ghana, 2018). Users of mobile banking can keep an eye on their accounts in real-time, and all transactions are strengthened in security by using a PIN. Users must enter their PIN to confirm a transaction after dialing the bank's appropriate

USSD code. People who want to use this service must be customers who have accounts with a particular bank that offers mobile banking services.

2.4.3 Mobile Money Services (MoMo)

Currently, Mobile Money (MoMo), is the most used mobile payment service in Ghana (Akomea-Frimpong et al., 2020). It is impossible to understate the significance of the MoMo sector, which has given rise to numerous employment prospects for FinTech firms, service providers, retailers, and merchants. Currently, MTN Mobile Money, Vodafone Cash, and AirtelTigo Cash are the three primary telecommunications operators offering MoMo services in Ghana. These service providers offer a platform so that their customers can sign up and conduct MoMo transactions whenever it's convenient for them. To start a transaction, subscribers must dial a USSD (Unstructured Supplementary Service Data) code. A special Personal Identification Number (PIN) that is only known by the user is used to verify and approve transactions. The interoperability account, which is run by MoMo providers, enables consumers to move money between a customer account kept with one MoMo provider and other participants in the financial system. In 2014, Tanzania was the first country in Africa to do this. Interoperability projects and use cases have been launched in Ghana, Nigeria, Rwanda, and Kenya (GSMA, 2019). This use case of integrating MoMo providers and banks has raised volumes between MoMo and financial systems (GSMA, 2019).

According to a 2021 report from the Bank of Ghana, the number of mobile money accounts increased from 32.7 million in February 2020 to 40.9 million in February 2021. From 2.00 billion transactions in 2019 to 2.86 billion transactions in 2020, the amount of mobile money transactions increased year over year by 42.27 percent. Additionally, year over year, the total amount of

transactions climbed by 82.37 percent, from GH 309.35 billion in 2019 to GH 564.16 billion in 2022 (Bank of Ghana, 2022). Table 2.4 demonstrates the growth in MoMo accounts, transaction volume, and transaction value from 2019 to 2023. Table 2.5 also shows Mobile Money Usage. In 2023 there has been a drastic increase in the use of mobile money services, specifically 40% (Bank of Ghana Annual Report ,2023). Table 2.4 shows the statistics relating to this increase.

Table 2.4 Mobile Money Statistics

Statistics	**2019**	**2020**	**2021**	**2022 (01-08)**	**2023**
Registered e-money accounts (Cumulative) (Million)	32,470,793	38,473,734	48.3	52.4	65.6
Active e-money accounts* (Million)	14,459,352	17,142,677	17.9	19.5	22.8
Registered Agents (Thousand)	306,346	423,892	580	642	816
Active Agents** (Thousand)	226,298	328,329	442	472	608
Total volume transactions for the year (GH¢' Million)	2,009,989,300	2,859,624,191	401	447	6.8 (billion)
Total value of transactions for the year (GH¢' Billion)	309,352,254,970	564,155,900,015	82.9	87.1	1992.34
Balance on Float (GH¢' Billion)	3,633,832,947	6,980,030,924	9.7	9.1	18.3

Source: Bank of Ghana Annual Report (2023)

Table 2.5 Mobile Money Usage

	2021 (million)	**2022(billion)**	**2023(billion)**
Total Transaction Value (GH₵)	2437.6	1072.16	1992.34
Total number of transactions (Million)	12.2	5.07	6.80

Source: Bank of Ghana Annual Report (2023)

2.5 Mobile Money Services Research: Evidence and Theory

Mobile money was barely heard of a decade ago, yet it has transformed the landscape of financial inclusion, spreading rapidly in developing and emerging market countries. Due to this, it has received substantial attention from researchers around the globe. Studies on mobile money (MoMo) has been carried out based on its adoption and use. An overview of the articles reviewed on mobile money services, highlighting the theory and framework, study design, setting, and pertinent research gaps are represented in Table 2.7 below.

Table 2.6 Studies on Mobile Money

Literature on the adoption and use of Mobile Money Services

Author(s)	**Study focus**	**Underpinning theory and framework**	**Research method/ setting**	**Relevant gaps for future research**

Akinyemi et al. (2020)	Factors that influence mobile money technology adoption	Technology Acceptance Model (TAM)	Mixed Method/ Ghana, Kenya, Lesotho, Mozambique, Nigeria, Rwanda, Senegal, South Africa, Tanzania, and Uganda	Future research should examine the factors that promote mobile money technology post-adoption and continues usage.
Aron (2018)	Overview of Literature on Mobile Money and the Economy	N/A	Quantitative/ Kenya	The need for post-adoption studies on mobile money Services.
Penney et al. (2021)	Determinants of consumer intention to use MoMo services	Unified theory of acceptance and use of technology 2 (UTAUT2) and (TAM)	Qualitative/ Ghana	Need for future studies to investigate the effects of consumer intention to use MoMo services on Adverse Digital Inclusion.
Yu et al. (2019)	Qualitative exploration of Mobile Money	N/A	Qualitative/ Ghana	Future research should examine mobile money's viability as a vehicle for financial inclusion and its effect on Adverse Digital Inclusion
Tonuchi (2020)	Improving mobile money services usage and adoption in the Covid-19 era	N/A	Mixed Method/ Nigeria	There is a need for further research on mobile money services usage and adoption in the Covid-19 era using Technology Acceptance Model

Baganzi et al. (2017)	Trust and Risk in Mobile Money acceptance	UTAUT and TAM	Qualitative/ Uganda	Need for further studies on mobile money fraud.
Ahmad et al. (2020)	Role of mobile money in financial inclusion and development	N/A	Qualitative/ Kenya	Need for further studies on the mediating role of mobile money in the relationship between financial inclusion and economic growth
Ismail et al. (2017)	Factors that influence behavioral intention in the adoption of mobile money transfer services	UTAUT	Quantitative/ Uganda	Further studies should be carried out on more experienced mobile money users.
Okello et al. (2020)	The mediating effect of digital consumer protection on mobile money adoption and use	Restricted access/Limited control theory (RALC)	Quantitative/ Uganda	Need for further studies on how digital consumer protection can influence the use and adoption of mobile money in the presence of adverse digital inclusion
Iheanachor et al. (2020)	The Relationship Between Mobile Money and Bank Performance	Dynamic Capability Theory	Qualitative/ Nigeria	The need for more studies to investigate the relationship between mobile money and bank performance using the a panel analysis approach

Echchabi et al. (2013)	Prospects of Mobile Money	Diffusion innovations theory (DOT)	Qualitative/ Morocco	Need for further research on the effects of customers' intention on Mobile money continues usage.

Source: Author's Construction

2.5.1 Adoption and use of Mobile Money Services

Mobile Money has consistently changed our daily lives by providing exciting and beneficial services, notably allowing users to pay for goods and services using their mobile devices wherever they go. They go about their business, withdrawing and depositing money via mobile phones, mobile banking, and purchasing airtime top-ups. Research in this area has examined the conditions that permit people to accept and make use of mobile payment systems (Batista et al. 2021). For example, Ismail et al. (2017) conducted a study in Uganda to investigate the factors that influence behavioral intention in the adoption of mobile money transfer services. The study adopted the unified theory of acceptance and use of technology (UTAUT). Findings from this study revealed that while transaction costs were determined to be minimal, customer expectations and social factors had a favorable and significant impact on behavioral intentions to utilize mobile money transfer services. However, there was a need for further studies to be carried out on more experienced mobile money users. Akinyemi et al. (2020) similarly examined the factors that influence mobile money technology adoption in a study conducted with participants from eleven different African countries. The study employed the technology acceptance model (TAM) and Two-Part Model to empirically investigate the drivers of mobile money adoption and the degree to which technology is used to send and receive payments in Africa's rural areas. Findings from

this study showed that age, years of schooling, unemployment, ownership of bank accounts, and ownership of mobile phones were found to be the key factors of adoption of mobile money technology.

As shown by the studies on the adoption and use of mobile money above, the initial adoption and usage of mobile payment services have been the main focus of current study. Post-adoption and continuous use have been under studied. Again, previous studies have focused on mobile money as an element for financial inclusion. However, the opportunity mobile money offers Adverse digital incorporation and its effects on financial inclusion is under explored (Heeks, 2022).

2.5.2 Capability Approach

This study bases on the capability approach drawing on both roles to examine how mobile money services can provide capabilities, extend people's capabilities, by leveraging their basic freedoms and broadening their choices. The capability approach provides a way to understand how the use of mobile money services increases the capabilities of people by widening their choices (Lashitew et al., 2019). Several studies (Haenssgen and Ariana 2018; Hatakka et al. 2019; Kleine 2010; Oosterlaken and van den Hoven 2011; Tshivhase et al. 2016) have used the capabilities approach to explain how two relating constructs lead to the increase in individual capabilities through the use of ICTs. Sen (1999; Sen and Nussbaum 1993) defines the capacity approach as a complete normative framework for analyzing and assessing human well-being and social arrangements, devising policies, and proposing social change in society. It is commonly used in a wide range of fields, including development studies, welfare economics, social policy, and political philosophy. It may be used to examine several elements of people's well-being, such as inequality, poverty, an

individual's well-being, or the average well-being of members of a group. It can also be used as an alternative evaluative tool for social cost-benefit analysis, or as a framework for designing and evaluating policies ranging from welfare state design in affluent societies to development policies implemented by governments and non-governmental organizations in developing countries (Robeyns, 2005).

The capabilities approach is made up of functionings and capability. The outcomes of a person's choices are referred to as functionings, whereas the freedoms are referred to as capabilities. Functionings are made up of "beings and doings" in the most fundamental sense (Gasper, 2017). As a result, living can be viewed as a collection of interconnected functions. In essence, functionings are the states and actions that make up a person's existence. Examples of functionings range from the simple (being well, having a decent job, and being safe) to the more complex (being joyful, having self-respect, and being tranquil) (Robeyns, 2017). Furthermore, Amartya Sen (1999) argues that functionings are critical to a proper comprehension of the capability approach; capability is defined as the freedom to perform valuable functions. What a person is and does is part of their entire capacity set, as is their selected combination of functionings. However, functionings can also be conceptualized in terms of an individual's capacities. As a result, understanding what comprises functionings is inextricably linked to comprehending capabilities.

Capabilities are the many combinations of functions that a person is capable of achieving (Robeyns, 2017). Formulations of capability are divided into two parts: functionings and opportunity freedom, which is the substantive freedom to pursue various functional combinations (Gasper, 2017). Ultimately, capabilities refer to a person's potential and capacity to produce worthwhile results, taking into consideration pertinent internal and external variables. This approach emphasizes that the capability set is not just about accomplishments but also about

freedom of choice, which has a direct impact on a person's quality of life (Sen 1999; Sen and Nussbaum 1993).

The capability approach has been adopted by this study to explain the freedom individuals have with regards to joining a digital network or using a digital service in pursuit of happiness. A person’s capabilities (the freedom to use mobile money) will result in an efficient cashless transaction. This result may be considered as a functioning and has a direct effect on the quality of life on that individual. Although using mobile money gives an opportunity for people to join a network that may digitally incorporated, people have the freedom to make the ultimate choice of joining this network. For example, Ghanaians who have the Ghana Card, have the freedom to register mobile money accounts with any network service provider in Ghana, so that they may be digitally included. Both functionings and capabilities can be identified in the scenario. People are given the opportunity to a wide range of choices as to how to make financial transactions. This, therefore, improves people’s overall quality of life in many ways due to the flexibility they provide (Adam & Alhassan, 2021). However, while these capabilities are enhanced, they can also be used as a conduit for exploitation bringing about adverse digital incorporation.

2.6 Digital Inclusion

The prevalence of the internet and mobile technology has provided many with the chance and a gateway to access and use technology for their development (Alhassan & Adam, 2021). The widespread adoption and usage of information and communication technologies (ICTs) has been fueled by the immense opportunities they provide for individual development. As a result, ICT

consumption is now seen as a basic utility equivalent to electricity, water, and gas (Ozili, 2018). Digital inclusion has been a popular word most usually used to define equitable access to ICTs and other associated benefits (Ali et al., 2020). On the other hand digital inclusion may be defined as the activities by which people and disadvantaged groups gain access to and abilities in using ICTs, allowing them to participate in and enjoy today's information society (Adam & Alhassan, 2020). According to Kidd & Lee (2018) digital inclusion has also been defined as "equitable, meaningful, and safe access for everyone, everywhere to use, lead, and build digital technology, services, and associated opportunities". Human rights-based, intersectional, and whole-of-society policies, multi-stakeholder approaches, and actions that take into consideration the numerous hurdles people encounter when gaining access to and using digital technology enable digital inclusion (Kidd & Lee, 2018). Digital inclusion entails more than just having a mobile connection. It also refers to an individual's ability to afford, value, and utilize the services provided. Only then will mobile applications and platforms, such as mobile money and mobile data, reach their full potential (Prabawati et al., 2021). Access to mobile technology serves as the foundation for the development of transformative mobile products and services. However, to be digitally included does not just mean to have ICTs, but use them for intended purpose. Digital inclusion therefore takes into consideration three important factors. Which are ICTs, access and usage.

2.6.1 Financial Inclusion and Mobile Money (MoMo)

Ahmad et al. (2020) describe financial inclusion as a situation in which everyone has easy access to a variety of high-quality financial services at reasonable prices. Financial inclusion entails providing all people in a society (including vulnerable people and low-income groups) with access

to financial products and services at an accessible cost and in a fair and transparent manner (Osabuohien & Karakara, 2018).

In recent years, the importance of financial inclusion for economic development has risen to the top of the development agenda (Ahmad, Green, Jiang, et al., 2020). As per recent study, mobile phones can be a key tool for fostering financial inclusion (Demirguc-Kunt et al., 2018). They enable the establishment of mobile money services. Mobile money uses mobile phone networks to conduct financial transactions using clients' funds that mobile network operators maintain (MNOs). Mobile money is distinct from mobile banking, which allows users to log into their bank accounts from their smartphones. Customers exclusively transact through MNOs and are not required to have an account with a financial institution while using mobile money, which is its defining characteristic (Adjei & Odei-Appiah, 2018). Mobile money can make payments more swift and inexpensive. By limiting the movement of cash, it can increase security; promote increased saving and self-insurance against minor negative shocks; increase transparency through digital accounting and thereby decrease corruption; and provide an entry point into the formal financial system (Demirguc-Kunt et al., 2018).

In Ghana, more than 90% of adults who use mobile phones use mobile money (Allen et al., 2019). MoMo users are considered as financially included, and in the long run considered as digital inclusion. People want to use MoMo so they can enjoy fast, cheaper and cashless transactions without having to go to a bank or having a bank account. The need to use MoMo and the rate at which mobile money services are utilized influences financial inclusion. In this case, an increase in financial inclusion will contribute to an increase in digital inclusion thereby bridging the digital divide.

2.7 Adverse Digital Incorporation

Adverse digital incorporation is a challenge emerging from digital inclusion. Adverse digital incorporation can be defined as inclusion into a digital system that allows a more fortunate group to derive disproportionate value from the work and resources of another less disadvantaged group (Heeks, 2022 as found in Philip,2013). By definition, adverse incorporation is exploitation given that the extraction of undue value results from the efforts of another group (Phillips, 2013). An example of this is the digital platform of the gig economy, which deprives employees of the monetary value of their work, gives workers little value, and widens inequalities between labor and capital (Heeks, 2022). Exploitation also occurs at the corporate level. As such, local African businesses such as hotels and travel agencies are increasingly looking to gain access to the international tourism market driven by digital platforms, hoping to be able to directly reach out to tourists, especially from the Global North. However, new internet-enabled foreign intermediaries (such as TripAdvisor) have emerged, with the ability to concentrate market power, control destination information, and achieve significant levels of capital accumulation outside Africa. In particular, the literature relates to the disadvantageous incorporation of workers forced into slave-like conditions (Natarajan et al., 2021). While such cases may exist in digital systems, for example, when people are coerced into trading in online pornography, the more typical case of criminal exploitation is the illegal deprivation of monetary value.

These examples concentrate on the extraction of financial or psycho-social value from labor or money, but another pattern of unfavorable integration is legibility: revealing information about people or resources to strong external actors so they can use it to their own advantage (de la Cruz, 2012; Hickey & du Toit, 2013; Meagher & Lindell, 2013). A more powerful entity may differentially derive political or other value from data regarding the existence, traits, or resources

of a less powerful group that has been captured in a digital system. This can be readily understood as adverse digital incorporation.

2.7.1 Drivers of Adverse incorporation

There are reasons behind why users end up joining digital systems that have adverse consequences for them. These reasons are ignorance and compulsion. Ignorance can be used to characterize people who are oblivious of crucial details or facts, as well as people who are experiencing cognitive dissonance or other types of cognitive relationships. There are three sorts of ignorance: factual ignorance (lack of knowledge of a fact), object ignorance (lack of familiarity with an object), and technical ignorance (absence of knowledge of how to do something) (Kundera, 2020). The role of ignorance in criminal exploitation is glassy as scammers target their victims using foreign country codes, tricking the recipients into thinking they are on a call with a relative who is employed in those nations (Javaid, 2020). Another example is when African gig workers sign up for digital platforms expecting a specific level of revenue without fully comprehending the risks (Anwar & Graham 2021).

Compulsion is another driver to joining an adverse digital system. Compulsion may be defined as a state of being forced to do something (Lüscher, Robbins & Everitt 2020). Usually this happens when there is no other option or choice. In the case of adverse digital incorporation, compulsion is one of the reasons why users might join a digital network even though they might have knowledge about the digital system being adversely incorporated. This would apply to many governmental surveillance programs, such as those that are connected to a digital identity that is needed to access public services (Heeks, 2020a). In Africa, most countries are developing or under

developed (Mintzberg, 2020). There are inadequate digital systems, therefore the few available is used by nearly everyone. An example is the use of a mobile phone for telecommunication, at a point communicating with another person in real time easily is to make a phone call. Before a mobile phone can be used in making calls it must be registered to a mobile network. By registering the person is being compelled to give out his or her personal data and join this digital system. All data and personal details captured under this mobile network could be adversely used risking the personal information of the user (Park, Oh & Lee 2019). However, this issue is not restricted to only Africa.

2.7.2 Exploitation

Once incorporated into a digital system, the value of activities and/or resources is allocated unevenly (Heeks, 2022). The root cause for this is power and control. The manner in which a more affluent group dominates the system into which the less affluent group is included (Bracking 2003, Hickey & Du Toit 2007). Due to this control, the former is able to extract and seize the value created by the latter.

Design Inequality

In a very direct sense, the more advantaged group has control of the system design, hence inequitable outcomes emerge from digital systems. The mechanisms and governance of digital networks can be designed in such a way that resources flow unequally by states or platform

corporations (Heeks, 2022). In certain mapping systems, for instance, data from low-income neighborhoods is taken by outsiders and presented online for the use and profit of others. However, there are also participatory designs that were planned by or with the community alongside such ones. These employ local residents to carry out the mapping and make specific steps to enable communities to utilize the data using low-tech interfaces, paper-based maps, and presentations at community gatherings (Heeks & Shekhar 2019).

Resource Inequality

Uneven results from the use of digital technologies may be caused by resource inequality. Users will be integrated into digital systems differently depending on their access to financial, human, social, physical, and informational capital compared to users with larger endowments (Heeks, 2022). In the case of biopiracy, for example, it is the global North actors who are aware of the economic worth of local plants while the Shuar are unaware of these factors, and it is the former who have the financial means, socioeconomic connections, and physical equipment required to turn the plants into pharmaceutical products (Nagan & Hammer 2013).

Institutional Inequality

Institutional inequality contributes to the exploitation of the target population. This is seen as formal laws and regulation and informal norms and values favors the more-advantaged group. For instance, small businesses in African that digitally integrate into global value chains frequently struggle, experiencing higher volatility and risk with the possibility of lower revenues (Foster et al 2018). The leading companies in the global supply chains are the ones who benefit; they are the

ones who set the requirements and standards that small businesses in Africa must follow, they also use the digital information flows to more tightly control their suppliers and change from less-to-more adherent ones (Heeks, 2022).

Relational Inequality

The relative dependencies between the participants in a digital system can be used to define relational inequality. Physical gig platforms, for example, that employ drivers and deliverers, can easily replace any individual worker (Gomez-Morantes et al 2019). As a result, the platforms are not dependent on the workers and can treat them unfairly. Individual workers, on the other hand, may rely heavily on the platform, especially if they have taken out loans based on the assumption of a fixed, stable income. It has been demonstrated that the more dependent a worker is on a platform, the more inclined they are to submit to exploitation (Schor et al. 2020). The atomization of gig workers in the absence of trade unions or worker groups worsens the asymmetry of dependency in this arrangement (Graham et al 2017). The platform's structural relationship to employees is thus numerous individual one-to-one relationships rather than a one-to-many relationship mediated by a worker organization, with the former being significantly weaker and more vulnerable to exploitation (Heeks, 2022).

2.8 Hypotheses Development

2.8.1 Mobile Money Services and Digital Inclusion

According to Akomea-frimpong (2020), service providers in Ghana have offered their customers the opportunity to register and link their mobile numbers with mobile money services (Akomea-Frimpong et al, 2020). Mobile money is less expensive than traditional banking services

(Bongomin and Munene 2019). And for this reason, most people especially in rural areas make use of mobile money services to make fast transactions that cost less compared to the bank. Mobile money serves as the technology in bridging the digital divide between people who are financially included and those are not (Agwu, 2020). This serves as supporting evidence in proving the positive relationship between mobile money services and digital inclusion. There is a wide range of literature that supports the positive influence of mobile money services on digital inclusion (Ahmad, Christopher & Jiang, 2020). Therefore, the hypothesis.

H_1: The use of *MoMo services positively influences Digital inclusion*

2.8.2 Mobile Money Services and Adverse Digital Incorporation

Heeks (2020) argue that a digital system that allows a more affluent group to extract disproportionate value from the work or resources of a less affluent group can be referred to as adverse digital incorporation. The use of mobile money services has created room for fraud and many other forms of exploitation (Martin, 2019). With mobile money rapidly becoming Ghanaians' basic means of payment, users can be exploited through taxation (Akomea-frimpong et al., 2020). Individuals may be forced to pay more for using the service. This form of exploitation may lead to adverse digital incorporation. Hence the hypothesis:

H_2: The use of *MoMo services positively influences Adverse digital incorporation*

2.8.3 Digital Inclusion and Adverse Digital Incorporation

Bridging financial gaps through digital inclusion to achieve financial inclusion is a very necessary strategy in recent times (Shofawati, 2019). Individuals who use mobile money services are considered to be digitally included (Serbeh et al., 2021). Individuals who are digitally included have a positive influence on adverse digital incorporation. Digitally included people can be exploited through mobile money when they are made to pay more for using the service (Akomea-frimpong et al., 2020). This is considered as adverse digital incorporation. The more people are digitally included the higher the level of adverse digital incorporation (Heeks, 2020). Therefore, the hypothesis:

H_3: *Digital inclusion positively affects Adverse digital incorporation*

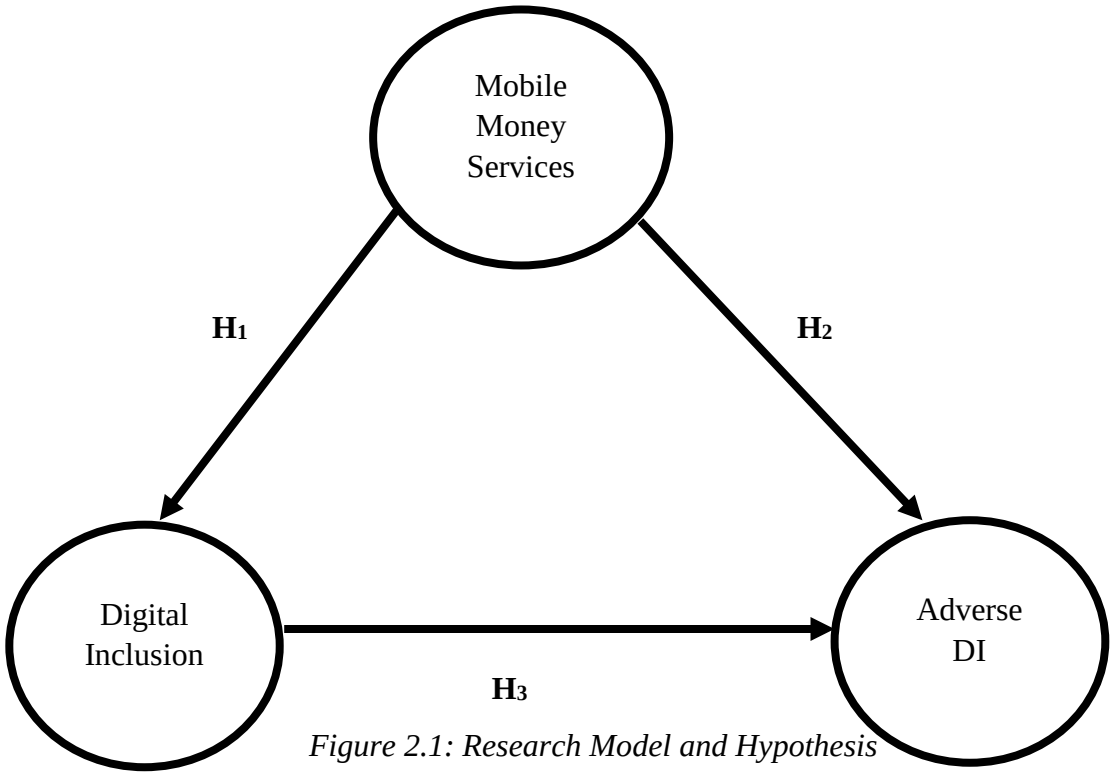

Figure 2.1: Research Model and Hypothesis

Source: Arthur's Construction

2.9 Mediating role of Digital Inclusion on the link between Mobile Money adoption and use and Adverse Digital Incorporation

Individuals who adopt and use mobile money services do so because they want to be digitally included (Heeks, 2022). This has practically become a necessity among those who want to enjoy the advantages and perks that come mobile money adoption and use. This also means digital inclusion has a strong influence on mobile money services (adoption and use). Mobile money services have become a gateway for adverse digital incorporation (Heeks, 2020). Individuals who are digitally included through the adoption and use mobile money, face the risk of being adversely exploited digitally. Mobile money and adverse digital incorporation have a positive relationship, however, this connection can be strongly influenced by digital inclusion(Heeks, 2022).

2.10 Chapter summary

This chapter reviewed literature on mobile payments, mobile money adoption and use, digital inclusion, and adverse digital incorporation. In addition, a review of the literature revealed numerous study gaps in mobile money studies that remain unaddressed. This chapter also discussed the research model that was adopted for this study. The study leans on Capability Theory in order to examine the influence of freedom on the choices people make when considering the use of mobile money services and its effect on digital inclusion and adverse digital inclusion. This theory was selected because research on mobile money adoption and usage has centered around theories like TAM, UTAT, and a few others. However, this research

selected the capability theory to examine mobile money usage and adoption in a different perspective unlike others.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The approaches used to accomplish the objectives of the study are covered in this chapter. The chapter's discussions of the research methodology, participant settings, data collection tools, data collection procedures, and data analysis techniques are given more attention. The objective is to explain the methodology used in this study and to show that the analysis followed the proper procedures for a scientific investigation.

3.2 Research Paradigm

Kuhn (1970, p.175) defines a research paradigm as a set of shared beliefs, values, and techniques that guide researchers in addressing problems and providing acceptable explanations. Research paradigms consist of three dimensions and these are Ontology, Epistemology, and Methodology (Lincoln and Guba, 2011). Firstly, Ontology refers to beliefs about what we can know about the world. In social research, key ontological questions include whether there is a common reality or multiple context-specific realities, whether social reality exists without human interpretations, and whether social behavior follows generalizable laws (Ritchie and Lewis, 2005). Secondly, Epistemology is concerned with understanding and finding about the social world. It addresses problems such as "how can we know about reality; and what is the basis of our knowledge" (Ritchie and Lewis, 2005, p. 13). Lincoln and Guba (2011) define methodology as the processes used to gather, analyze, and draw reliable conclusions to advance knowledge. Methodology guides the discovery of knowledge (epistemology) via an understanding of the existing knowledge (ontology).

There are three main paradigms that have been developed over the years in Information Systems (IS) research. These paradigms are Positivism, Interpretivism and Critical Realism (Mingers, 2004). Positivists believe that scientific theories can be validated through empirical observation and logical analysis of real-world events (Leong, 2014). The validity of a theory is determined by how well its predictions align with sensory data. Positivists also believe that researchers observing the same phenomenon or problem will produce similar results if they apply a similar approach.

According to the Interpretivism worldview, social actors and individuals shape reality by their views. Interpretivism recognizes that individuals from diverse origins, experiences, and assumptions shape reality via social interactions (Wahyuni, 2012). Interpretivists engage in interaction with respondents to understand their perspectives on a topic. According to Wahyuni (2012), qualitative data provides detailed explanations of social constructs, making it a preferred method.

The Interpretivism worldview, social actors and individual views shape reality. Interpretivism posits that individuals with diverse origins, experiences, and assumptions shape reality via social interactions (Wahyuni, 2012). Interpretivist researchers engage in interaction with respondents to understand their perspectives on a topic. According to Wahyuni (2012), qualitative data provides detailed descriptions of social conceptions, making it preferred for research purposes.

According to Mingers (2004), critical realism connects positivist epistemology with interpretative ontology. According to critical realism, unobservable events impact observable ones. Understanding the social environment requires humans to examine the underlying mechanisms that cause unobservable occurrences. This is crucial in experimental settings since it allows researchers to distinguish between the event itself and its causes. Critical realism suggests that

researchers set observable circumstances for their studies, but the findings are influenced by underlying laws and mechanisms (Sharpe and Bhaskar, 1976). Leong (2014) states that positivism aids the researcher to empirically observe real events and explain using logical analysis. Furthermore, with positivism, the standard for assessing the validity of a scientific theory is whether theoretically based predictions are coherent with information gathered using one's senses (Leong, 2014).

3.3 Research Methods

A research method is a group of methods, tools, and approaches for collecting and interpreting data (Wahyuni, 2012). According to Johnson and Onwuegbuzie, there are two main types of research methods widely used by researchers (2004). A method that combines quantitative and qualitative data is employed. Qualitative methods are related to the interpretivist paradigm, whereas quantitative methods are related to the positivist paradigm (Mingers, 2004). This study used a quantitative methodology, namely a survey. Surveys provide a quantitative assessment of this group's attitudes by looking at a sample of this group (Creswell, 2009b). Cross-sectional studies that use questionnaires to collect data for the purpose of extrapolating from a sample to the whole population are sometimes called surveys (Babbie, 1990). The survey is the main data collection tool for this cross-sectional study.

3.3.1 Questionnaire Development

The study adopted a quantitative survey methodology. To gather data, questionnaires were distributed to respondents. Work was done to ensure that the data gathering instrument was reliable and of high quality. According to Churchill (1979) and Straub (1989), the creation of survey instruments includes both initial instrument development and instrument improvement.

After reviewing literature on mobile money services, digital inclusion, and adverse digital incorporation, the survey instrument (questionnaire) was created. After the questionnaire was created, a pre-test of the instrument was conducted before a pilot test (Churchill, 1979; Straub, 1989). By seeking the opinions of experts on the test items, a pre-test of the questionnaire was conducted. They offered helpful criticism, which assisted in enhancing the questionnaire's substance. This procedure was carried out to ensure the validity of the content (Straub, Boudreau, and Gefen, 2004). A pilot test was carried out after the questionnaire was modified in response to expert feedback. Fifty (50) individuals who use mobile money services participated in a pilot study. The survey received favorable feedback, which means Straub et al. (2004) found it to have a high level of content validity and was therefore ready to be used for data collection. Three elements made up the questionnaire created for this investigation. Section A's primary emphasis was the demographics of the respondents. The questions included ones on gender, age, marital status, occupation, and monthly income. Use of mobile money and network subscription were the main topics of Part B. This section featured inquiries about the frequency, duration, and use of mobile money services. The third and final section, or Part C, concentrated on the elements that influence digital inclusion and mobile money usage. Additionally, there were questions in this section about the elements that contribute to adverse digital incorporation. The constructs and the indicators used to quantify them were discovered through the review of literature. The items measuring the individual components were also assessed using a five-point Likert-type scale with

values ranging from 1 to 5, with 1 being strongly disagree and 5 being strongly agree. For multivariate analysis, the five-point Likert scale has been regarded as producing reliable and trustworthy results (Hair, Black, Babin, and Anderson, 2010).

3.3.3 Participants Setting

Residents of Ghana made up the respondents. In particular, respondents who use mobile money services were sampled for this study because it aimed to determine and investigate the relationship between mobile money services, digital inclusion and adverse digital inclusion in Ghana.

3.3.4 Sample Selection

A representative sample of a population is one from which data may be gathered and analyzed that can yield conclusions that are consistent with those that would have been reached if data had been gathered on the full population (Fricker, 2008). Therefore, researchers must pay close attention to the sample size of their study if they hope to attain consistency and dependability of results (Hair et al., 2010). PLS-SEM concepts were applied to ensure sample adequacy. The most used technique in PLS-SEM for determining the minimal sample size is the "10-times rule" (Hair, Ringle, and Sarstedt, 2011; Peng and Lai, 2012). The "10-times rule" states that a study's sample size should be at least "10 times" the number of inner or outer model connections that are strongest when they connect to any of the model's components (Goodhue, Lewis, Thompson, and Thompson, 2012). In other words, Mobile Money Services has the most indications, as per the research paradigm for this study, which is presented in Chapter Three (5 indicators). According to the "10-times rule," 5*10=50 is the smallest sample size required for this investigation.

Consequently, at least 50 volunteers are required for this study. Nonetheless, when the questionnaires were sent, 242 respondents participated in the poll, exceeding the "10-times" rule's minimum sample size requirement.

After determining the bare minimum sample size necessary for this investigation, it was important to choose a sampling strategy that would facilitate data collecting. As a result, convenience sampling was used as the non-systematic strategy in this investigation. The study used convenience sampling since it took less time and money (Schonlau, Fricker, and Elliott, 2002). Furthermore, due to the distributed nature of respondents across the country, surveying every MoMo user proved impractical. Using a convenience sample approach, the researcher was able to contact some people who were easily reached in other parts of the country using Google Forms.

3.3.5 Data Collection Process

For this research, only primary data were used. Three (3) steps were used to collect the data for this investigation. Namely, constructing the survey instrument, delivering the questionnaire to respondents, and developing an appropriate sample frame. Data were gathered using questionnaires that were produced in line with the study's defined hypothesis. This was done to ensure that the final objective of the study was achieved. The information was given by Ghanaian respondents who use MoMo. The surveys were distributed using Google Forms. Each responder was only allowed to complete the survey once. During June and August 2022, data was collected.

Nevertheless, some respondents did not also complete the electronic version. Thus, 242 responses in all were obtained.

3.4 Method of Data Analysis

Responses from the participants were gathered. Then, the surveys were checked for mistakes. There were no incomplete questionnaires, making it possible to examine the data. Data were coded and structured into integrated constructs in Microsoft Excel before being examined by the SmartPLS program.

3.4.1 Partial Least Square in Structural Equation Modelling

Structural Equation Modelling (SEM) is a multivariate data analysis approach frequently used in IS research for construct validation and investigating the links between constructs (Gefen, Straub, and Boudreau, 2000). SEM is "a class of techniques that seeks to characterize hypotheses about observed data's means, variances, and covariances in terms of a smaller set of "structural" parameters determined by a postulated underlying model", according to Kaplan (2000). SEM is approached from two perspectives. That is, Covariance-based SEM (CB-SEM) utilizing software such as Mplus, AMOS, LISREL, and so on, and Partial Least Squares SEM, which focuses on variance analysis and may be performed using software such as SmartPLS and ADANCO (Hair, Risher, Sarstedt, and Ringle, 2019; Wong, 2019). Following the determination of the bare minimum sample size required for this inquiry, it was critical to select a sampling technique that would enable data collection. As a result, convenience sampling was chosen as the investigation's non-systematic technique. Convenience sampling was utilized in the study since it saved time and

money (Schonlau, Fricker, and Elliott, 2002). Furthermore, polling every MoMo user proved impracticable due to the dispersed distribution of respondents across the country. Using Google Forms, the researcher was able to contact some persons who were easily reachable in other regions of the nation using a convenience sample strategy.

Examining the measurement models is the first step in evaluating PLS-SEM findings. Essentially, the evaluation or estimation of the measurement model aids the researcher in comparing the theory used for the inquiry to the actual data collected for the study. The criteria for assessing measurement models differ for formative and reflective components (Hair, Risher, Sarstedt, and Ringle, 2019; Urbach and Ahlemann, 2010). This study includes reflective constructs, a test for the measurement model's reliability and validity, and a structural model evaluation. This study studied indicator reliability, internal consistency for reliability, convergent validity, and discriminant validity while ensuring the application of conventional judgment methods (Hair et al., 2019).

After successful validation of the measurement model, structures were evaluated (Hair et al., 2019; Urbach and Ahlemann, 2010). Structural models were evaluated using the five basic steps described in (Hair et al., 2019; Urbach and Ahlemann, 2010). This includes assessment of structural models for collinearity issues, assessment of importance and relevance of structural model relationships, assessment of goodness of fit (GOF), assessment of effect size (f-squared), and prediction relevance (q-squared) assessment. After completing the structural model measurements and evaluations, we performed a multigroup analysis to examine the effects of moderator variables (income and education) on the relationships between the independent and dependent components.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter discusses the results analysis and discussion. The collected data was analyzed using the recommendations for partial least squares structural equation modeling. The data was assessed in two parts; first, the measurement model was evaluated for indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. Following the measurement evaluation, the structural model was evaluated. The structural model was evaluated for multicollinearity, path coefficient significance, and goodness of fit. The results were discussed following an evaluation of both the measurement and structural models.

4.2 Demographic Characteristics of Respondents

Table 1 provides information about the respondents' gender, age, education, occupation, and income, among other things. In total, 242 respondents took part in this study. According to the data collected, the majority of participants use MoMo, which includes Mobile Telephone Network (MTN) Mobile Money, Vodafone Cash, and AirtelTigo Cash (242 respondents).

Table 4.1: Demographic characteristics of respondents

Demographics	Characteristics	Number	Percentage (%)
Gender	Male	130	54
	Female	112	46
	Total	**242**	**100**
Age	15-25	200	83
	26-35	32	12.6
	36-45	7	3
	46-55	2	1
	56-65	1	0.4
	Total	**242**	**100**
Education	SHS	6	2.5
	Diploma	10	4.1
	Degree	205	85
	Masters	20	8
	None	1	0.4
	Total	**242**	**100**
Occupation			
	Entrepreneur/Self-employed	13	5.4
	Public Service worker	15	6.2
	Private Service worker/NGO	13	5.4
	National Service	2	1
	Unemployed	199	82
	Total	**242**	**100**
Monthly Income	0- GH₵1000	178	7
	GH₵1001- GH₵2000	50	20
	GH₵2001- GH₵3000	7	3
	GH₵3001- GH₵4000	2	1
	above 4001	5	2.
	Total	**242**	**100**
MoMo Subscription	MTN	110	45.5
	Vodafone	60	25
	AirtelTigo	30	12
	all three	42	17.5
	Total	**242**	**100**
MoMo usage within a day	1-5 times	128	53
	6-10 times	84	35
	above 10 times	30	12
	Total	**242**	**100**

Source: Author's construction

4.3 Assessment of Measurement Model

Inspection of the measurement model is the first step in evaluating results with PLS-SEM. "Model estimation provides an empirical assessment of the relationship between indicators and constituents (measurement models) and constituents (structural models)" (Hair, Hult, Ringle, and Sarstedt, 2016, p.105). In essence, evaluating or estimating a measurement model helps researchers compare the theory used in the study and the actual data obtained in the study.

Criteria applied to assess measurement techniques differ for shaped and reflective structures (Hair, Risher, Sarstedt, & Ringle, 2019; Urbach & Ahlemann, 2010). As such, all components of this study were reflexive. Therefore, the reliability and validity of the measurement model should be verified before any structural model evaluation. Therefore, in this study, the reliability of the indicator, the internal consistency of the reliability, the convergent validity, and the discriminatory validity were assessed while ensuring that the usual decision rules were followed (Hair et al., 2019; Urbach and Ahlemann, 2010).

4.3.1 Indicator Reliability

Indicator reliability is defined as the degree to which "a variable or group of variables agrees with what it measures" (Urbach and Ahlemann, 2010, p. 18). A reflective indicator load is monitored to ensure reading reliability. An indicator loading of 0.708 or higher is recommended to show that the constituents or latent variables explain at least 50% of the indicator variance, ensuring sufficient item reliability. (Hair et al., 2019). However, not all indicators were heavily loaded into their respective latent variables. They were therefore excluded from the model (Gefen and Straub, 2005). This means that when the study was first conducted, some of the indicators were lower than

the minimum required. In particular, DI2 was removed because the indicator loading was -0.101. The model was rerun using the PLS algorithm after removing DI2. DI3 and DI5 have also been removed. This is because the indicator loads were -0.088 and -0.036 respectively and were not significant. The indicator loading for DI4 was 0.644, but it was not cleared because a latent variable cannot have only one indicator. Data from this analysis are reviewed to obtain more reliable indicators that measure structure and meet the required thresholds. The results were then extracted to perform measurements and structural model assessment and evaluation.

Figure 4.1: shows the indicator loadings after DI2, DI3 and DI5 were deleted and the model re-run using the PLS algorithm.

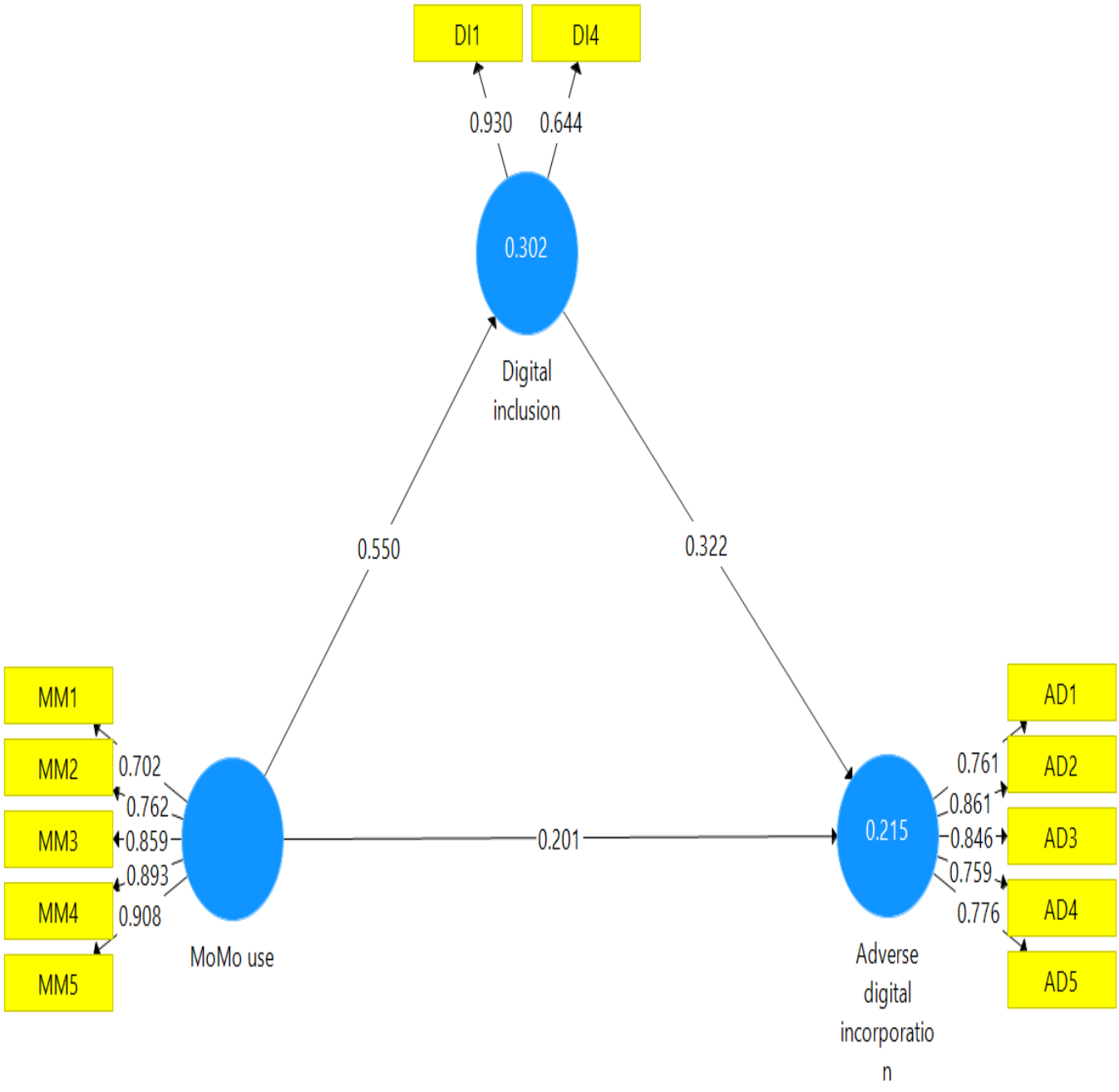

Figure 4.1 Results of PLS analysis

4.3.2 Internal Consistency Reliability

In the second stage, Cronbach's alpha is used to test the accuracy of the indicator and then check the quality of its internal consistency. Cronbach's alpha is high, meaning that all statements in the latent variable have the same scope and importance (Cronbach, 1951). Cronbach's minimum alpha threshold is 0.70. (Nunally, 1978). As shown in Table 2, all latent variables or components had alpha values greater than 0.70, except digital inclusion, which had a Cronbach alpha of 0.483. Researchers have criticized Cronbach's alpha for its low value and low accuracy as an indicator of reliability (Hair et al., 2019; Urbach and Ahlemann, 2010). As a result, another measure of display reliability was proposed. This is the composite reliability of Joreskog (1971).

Composite reliability was introduced to address the shortcomings of Cronbach's alpha (Urbach and Ahlemann, 2010). Unlike Cronbach's alpha, combined reliability assumes that all indicators have different loadings (Henseler, Ringle, and Sinkovics, 2009), so it serves as a good measure of indicator reliability. (Chin, 1998). Reliability ratings between 0.60 and 0.70 are considered 'suitable for exploratory research', as higher values indicate more confidence. Additionally, a score between 0.70 and 0.90 indicates acceptable, while a score of 0.95 or higher indicates that the item is more than necessary and is considered problematic. Kaiser, 2012). The resulting composite confidence score ranges from 0.775 to 0.916, meaning fair to good.

Rho A is an alternative to composite reliability for measuring consistent reliability (Dijkstra and Henseler, 2015). Rho_ A values of 0.70 are recommended. All latent variables have Rho_ A values more than 0.70, with the exception of digital inclusion, which has 0.654 and falls below the criterion shown in Table 4.2.

Table 4.2 Construct Reliability

Constructs	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Adverse digital incorporation	0.861	0.872	0.900	0.643
Digital inclusion	0.483	0.654	0.775	0.640
MoMo use	0.885	0.911	0.916	0.687

4.3.3 Convergent Validity

Rho A is an alternative to composite reliability for measuring consistent reliability (Dijkstra and Henseler, 2015). A Rho_A value of 0.70 is recommended. All latent variables have Rho_A values greater than 0.70, but digital inclusion of 0.654, meeting the criteria shown in Table 4.2. To calculate AVE, square each indicator load for the build and find the average. The AVE threshold is 0.50. (Hair et al., 2019). This means that the underlying component or constituents explain at least 50% of the variability of the item and thus have sufficient convergent validity (Hair et al., 2019; Urbach and Ahlemann, 2010). Table 4.2 shows that the AVE values are greater than the minimum requirement of 0.50, indicating that acceptable convergence validity was achieved.

4.3.4 Discriminant Validity

The final step is to assess the discriminant validity. Discriminant validity is used by Hair et al. (2019, p.9) describes it as ``the degree to which a component empirically differs from other components in a structural model". Crossloading caused by combining and comparing each latent variable score with every other item (Chin, 1998). Generalize that indicators for a latent variable

or construct distinguish from each other if each indicator loading for that construct is higher than any other construct and each of the constructs or latent variables loads the most for that indicator or related elements can. That is, they cannot be used interchangeably. Latent variables differ from each other because they load related structures more than any other structure.

Table 4.3 Indicator Item Cross Loading

	Adverse digital incorporation	**Digital inclusion**	**MoMo use**
AD1	0.761	0.367	0.404
AD2	0.861	0.352	0.299
AD3	0.846	0.405	0.299
AD4	0.759	0.276	0.269
AD5	0.776	0.307	0.202
DI1	0.494	0.930	0.508
DI4	0.087	0.644	0.361
MM1	0.257	0.343	0.702
MM2	0.273	0.338	0.762
MM3	0.362	0.553	0.859
MM4	0.297	0.437	0.893
MM5	0.354	0.543	0.908

The Heterotrait-Monotrait ratio (HTMT) (Voorhees, Brady, Calantone, & Ramirez, 2016) has been published by Henseler et al. (2015) as a good measure of discriminant validity. Hensler et al. (2015) using a Monte Carlo simulation analysis he proposed superior performance of HTMT and the results he showed that HTMT has higher sensitivity and specificity (d 20.82%). The mean of

item correlations across structures relative to the (geometric) mean of the mean correlations of items measuring the same structure is defined as HTMT (Hair et al., 2019, p.9).

When HTMT readings are high, discriminating validity issues develop. A needed threshold of 0.90 is suggested (Gold, Malhotra, and Segars, 2001; Henseler et al., 2015). When HTMT levels above the 0.90 threshold, discriminant validity is absent. As shown in Table 4.4, all HTMT values did not surpass the 0.90 criterion, indicating that discriminating validity was reached (Gold et al., 2001; Hair et al., 2019). Furthermore, bootstrapping can be used to determine whether the HTMT value is significantly different from 1.00 (Henseler et al., 2015) or the threshold value (that is, 0.90). Table 4.4 demonstrates this.

Table 4.4 Discriminant Validity- Heterotrait-Monotrait Ratio (HTMT)

	Adverse digital incorporation	**Digital inclusion**	**MoMo use**
Adverse digital incorporation			
Digital inclusion	0.550		
MoMo use	0.416	0.802	

4.4 Structural Model Assessment

Following a successful validation of the measurement model, the structural model is tested (Hair et al., 2019; Urbach and Ahlemann, 2010). The structural model was evaluated using five critical phases, as recommended by (Hair et al., 2019; Urbach and Ahlemann, 2010).

4.4.1 Assessing Structural Model for Multicollinearity Issues

Multicollinearity is the first thing to look at when analyzing a structural model. When factors are merged in a multivariate regression research, multicollinearity arises (O'Brien, 2007). To measure multicollinearity, the variance inflation factor (VIF) for each independent component was utilized. A minimum threshold of 5 is essential to prevent collinearity issues (Hair, Ringle, and Sarstedt, 2011). If this criterion is met, the construct under consideration is practically a perfect linear combination of independent variables previously included in the equation (Hair et al., 2011; Hair et al., 2016; Mansfield et al., 1982). Table 4.5 shows that all VIF values are less than 5, indicating that there are no difficulties with collinearity in this investigation.

Table 4.5 Multicollinearity Statistics (Inner VIF)

	Adverse digital incorporation	**Digital inclusion**	**MoMo use**
Adverse digital incorporation			
Digital inclusion	1.433		
MoMo use	1.433	1.000	

4.4.2 Assessing Structural Model for the Significance of Path Coefficient

After examining collinearity, it is important to assess the importance of path coefficients between latent variables in the model (Urbach and Ahlemann, 2010). To do this, we use SmartPLS to perform a bootstrap process with a large number of 5000 subsamples and a two-tailed distribution of 0.1 (10%). Bootstrapping is defined as ``a nonparametric resampling process that examines the variability of sample data rather than using parametric assumptions to determine the accuracy of

the estimates" (Strekens and LeroiWerelds, 2016, p. 2). PLS-SEM does not show the data to be normally distributed, so a nonparametric test using SmartPLS is needed (Hair et al., 2016). Bootstrapping provides t-statistics for analyzing direct and indirect effects (Hair et al., 2016). Results are shown in Table 4.6. A minimum critical value of 1.65 is ideal for a 10% (two-sided) significance level, as 95% confidence intervals are assumed (Hair et al., 2011). From the table below, we can see that all three hypotheses are supported. The critical t-values for these hypotheses are greater than or equal to 1.65.

Table 4.6 Hypothesis Testing

Hyp.	**Effect**	**Std beta**	**Std error**	**T Statistics**	**P Values**	**Decision**	**95.0% CI LL**	**95.0% CI UL**
1	Digital inclusion -> Adverse digital incorporation	0.326	0.087	3.716	0.000	Supported	0.450	0.463
2	MoMo use -> Adverse digital incorporation	0.205	0.095	2.126	0.034	Supported	0.357	0.362
3	MoMo use -> Digital inclusion	0.553	0.083	6.647	0.000	Supported	0.665	0.680

Table 4.7 Indirect Effect

	Sample Mean (M)	**Standard Deviation (STDEV)**	**T Statistics (|O/STDEV|)**	**P Values**
MoMo use -> Digital inclusion -> Adverse digital incorporation	0.180	**0.055**	**3.235**	**0.001**

4.4.3 Assessing the Goodness of Fit

After evaluating the structural model with respect to the importance of the path coefficients, the goodness of fit (GOF) of the model was determined. This assessment indicates whether the model fits well or poorly (Henseler et al., 2015). GOF testing also helps researchers identify misspecifications in measurements and structural models (Dijkstra and Henseler, 2015). The most commonly used criterion is the R-squared coefficient of determination (R 2) (Hair et al., 2019). R2 is the explanatory power of the model. It shows the total effect of the extrinsic latent variable on the intrinsic latent variable (Hair, Sarstedt, Hopkins, & Dreieckwieser, 2014). R2 ranges from 0 to 1 with increasing explanatory power.

R2 values of 0.25, 0.50, and 0.75 are considered poor, moderate, and considerable, respectively (Hair et al., 2011; Henseler et al., 2009). Chin (1998) considers R2 values below 0.190 to be weak, values around 0.333 as mean, and values around 0.670 to be significant in IS studies. According to Table 4.7, the model has an R2 of 0.204, which is considered bad.

Table 4.7 R Squared

	R Square	**R Square Adjusted**
Adverse digital incorporation	0.215	0.204
Digital inclusion	0.302	0.297

In PLS-SEM, Henseler, Hubona, and Ray (2016) advocated for one of the following criteria to be used in determining a model's GOF. They are the standardized root mean squared residual (SRMR), the unweighted least squares discrepancy (dlus) and the geodesic discrepancy (dG). Each of these three can be used to evaluate a model's GOF. The SRMR was employed in this study. This

is because SRMR has been widely utilized and regarded as an adequate metric for measuring the goodness of fit in PLS-SEM by numerous studies (Bailey et al., 2017; C. S Lee and Ma, 2012. Papas, 2017). As a rule of thumb for this criterion, the lower the SRMR, the better the model fits. An SRMR of zero gives an exact match. However, his SRMR of ≤0.08 is acceptable or recommended (Henseler et al., 2016). An SRMR score above 0.08 indicates a poor fit. According to Table 4.8, the predicted value of SRMR is 0.086, which is above the 0.08 criterion. As a result, the model does not fit well and there are some misspecifications of the measurement or structural model.

Table 4.8 Goodness of Fit (SRMR criteria)

	Original Sample (O)	**Sample Mean (M)**	**95%**	**99%**
Saturated Model	0.086	0.063	0.074	0.079
Estimated Model	0.086	0.063	0.074	0.080

4.4.4 Assessing the Effect Size

After evaluating the GOF of the structural model, the next step is to examine the effect size of each pathway in SEM using Cohen's f2 (Cohen 1988). Effect sizes assess whether an independent component has a significant effect on a dependent component (Cohen, 1988). That is, it assesses the importance of dependent components compared to independent components (Urbach and Ahlemann, 2010). When the PLS algorithm is run with SmartPLS, the f2 value is calculated. f2 values between 0.020 and 0.150, 0.150 and 0.350, and greater than 0.350 indicate that the extrinsic latent variable or independent component has a small, moderate, or large effect on the dependent component (Chin, 1998 ; Cohen, 1988; Gefen et al., 2000). From Table 4.9, we can see that digital

inclusion and momo use have a small impact on dependency structures, i.e. negative digital integration.

Table 4.9 f-square

	Adverse digital incorporation	**Digital inclusion**	**MoMo use**
Adverse digital incorporation			
Digital inclusion	0.092		
MoMo use	0.036	0.433	

4.5 Direct Effects

The study explored the relationship mobile money services usage and digital inclusion. This was done to understand why people would want to be digitally included on a network that could adversely exploit them. This study empirically tested the relationship between mobile money services use and digital inclusion by relying on data collected from 142 individuals who use mobile money services in Ghana. The hypothesis formulated for this test had a positive relationship. In addition, mobile money use was found to significantly influence digital inclusion. The result of the supported hypothesis can be found in table 4.6.

From the analysis of the outcome, it was revealed that the hypothesis of Mobile Money Use, being positively associated with digital inclusion was supported. In addition, as people feel the need to use mobile money service and are attracted to it by its efficiency, speed and other benefits, they are being digitally included (Okello, 2020).

Heeks (2022) defined adverse digital incorporation as “an inclusion in a digital system that permits a more advantaged group to extract disproportionate value from the work or resources of another

less advantaged group". As part of the hypothesis, mobile money use being positively associated with adverse digital incorporation was supported. Individuals who use mobile money enjoy the benefits that come with using its services, however they are on a network that can adversely exploit them (Heeks, 2022). As such more and more individuals join the network to enjoy these benefits despite the risks. In addition, mobile money use and adverse digital incorporation have a directed relationship and hypothesis is supported. This can be seen in table 5.6, in the previous chapter where the hypothesis has a critical t-value of 2.126. This can be affirmed by other studies undertaken in the adverse digital incorporation space (Philip, 2013; Heeks, 2022).

From the analysis of the results, it was revealed that the hypothesis of digital inclusion being positively associated with adverse digital incorporation was supported. As seen in table 5.6, the hypothesis of digital inclusion having a positive influence on adverse digital incorporation is supported, and has a critical t-value of 3.716. This indicates that people who want to be digitally included risk being adversely exploited digitally. This may happen with or without the user's knowledge (Heeks, 2022).

Furthermore, users who are aware of these exploitive networks, have no choice but to join since they want to be digitally included (Natarajan et al., 2021). In addition, findings from other studies conducted on adverse digital inclusion such as Heeks (2022) and Kundera (2020) reveal that digital inclusion positively influences adverse digital incorporation.

4.6 Indirect Effects

According to Heeks (2022) users of a digital space do not just get exploited until they join a digital network. The need to join and use a digital network such as Mobile Money brings about Digital Inclusion with may lead to Adverse Digital Incorporation in the long run (Heeks, 2020a). There is an indirect relationship between mobile money use and adverse digital incorporation. Digital inclusion plays a mediating role between mobile money use and adverse digital incorporation. As represented in table 4.7, the critical t-value is 3.235 which is higher than 1.65, therefore confirming the indirect effects between mobile money use and adverse digital incorporation with digital inclusion serving as their mediating factor.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

The discussion of the examination of empirical findings dominated the preceding chapter. As a result, the focus of this chapter is on wrapping up the study by summarizing its major results in light of its goals and outlining the significance of those findings for future research, policy, and practice.

5.1 Answers to Research Questions

The results of this study are presented on the basis of the research objectives. First, how mobile money services leads to people being digitally exploited through adverse digital incorporation. Second, the effect of digital inclusion on adverse digital inclusion among mobile money users. Finally, the mediating role of digital inclusion on the effect of mobile money services on adverse digital inclusion. Below are three subsections detailing this part.

5.1.1 Mobile Money Services leading to Digital Exploitation

Literature reviewed on mobile payment services in Ghana revealed there are main mobile payment services frequently used in the country. They are Mobile Money, Mobile Banking and Internet Banking (Bank of Ghana, 2022). The study, however, focused on mobile money because the aim of this research is to understand and examine the linkages between mobile money services, digital inclusion and adverse digital inclusion. Data collected for this study revealed that most of the

respondents in Ghana use mobile money services. This is largely credited to the fact that mobile money is fast, safe and efficient as compared to other mobile payment services.

Furthermore, it was revealed that individuals find the use of mobile money service more convenient and considering the number of people using the service, it compels other individuals to also adopt and use these digital services (Yu et al., 2019). The personal details of each user is recorded and kept by the service provider through a Know Your Customer (KYC) process. These details can possibly be traded out to other agencies by the service providers without the knowledge of the subscriber. In addition, taxes and other charges may be levied. Subscribers will have no choice but to pay for these taxes and charges because want to keep using mobile money.

5.1.2 Effect of Digital Inclusion on Adverse Digital Inclusion among Mobile Money Users

Literature reviewed on digital inclusion revealed that to be digitally included an individual must be able to have access and use ICT. The gap between the digitally included and those who are not, known as the digital divide has drastically been reduced. Hence, the existence of adverse digital inclusion. Digital inclusion has a positive relationship and a strong effect on adverse digital inclusion. Researchers such as Heeks and Philip in their study suggest that adverse digital incorporation cannot be simply avoided or eradicated. This is as a result of digital inclusion. Individuals who join a digital network to become digitally included risk being adversely exploited digitally.

5.1.3 Mediating Role of Digital Inclusion

Digital inclusion acts as a mediator between mobile money and adverse digital incorporation. Literature reviewed showed that digital inclusion influences adverse digital incorporation, however digital inclusion also drives individuals to use mobile money services. Mobile money users influenced by the need to bed digitally included. However, after being digitally included there is a risk of being adversely exploited digitally.

5.2 Mapping out Research Objectives with Research Findings and Contributions

Research Purpose: The aim of this study is to understand and examine the linkages between mobile money services, digital inclusion and adverse digital inclusion. Table 7.1 gives a brief summary of the findings of the study in line with the study's objectives. Furthermore, the contributions, implications, and recommendations of the study are outlined.

Table 5. 1 Mapping Research Objectives to Findings and Contributions

Research Objectives	Research Findings	Supporting Literature	Contributions, Implications and Recommendations

To understand the extent to which the use of mobile money services leads to people being digitally exploited (through adverse digital incorporation)	The existence of mobile money has created a large pool of opportunities for digital exploitation by network providers and other more advantaged groups.	Baganzi et al. (2017)	This study further adds to the existing knowledge regarding digital exploitation in mobile money services.
To understand the effect of digital inclusion on adverse digital inclusion among mobile money users.	The need to be digitally included has compelled most Ghanaians to use mobile money. This influences groups with higher advantages to digitally exploit individuals using the service.	Heeks (2022)	Extent literature has largely focused on the both digital inclusion and adverse digital inclusion. This study however includes the use of mobile money in the research. This study, therefore, adds to the limited literature in the area of in adverse digital inclusion.
To understand the mediating role of digital inclusion on the effect of mobile money services on adverse digital inclusion.	Individuals who adopt and use mobile money services do so because they want to be digitally included. Individuals who are digitally included through the adoption and use of mobile money, face the risk of being adversely exploited digitally. Mobile money use and adverse digital inclusion have an indirect relationship through digital inclusion.	Heeks (2022)	Findings reveal that Mobile money services have an indirect effect on adverse digital inclusion. Digital inclusion plays a mediating role between. This study therefore affirms the fact that without mobile money services use adverse digital inclusion will still be present because digital inclusion is also present. With regards to policy, the government must closely regulate and crosscheck the

			privacy laws of network service providers in the country.

Source: Authors Construction

5.3 Conclusion

This study examined the linkages between mobile money usage, digital inclusion and adverse digital incorporation. In order to address the objectives of this study, the study leaned on the capability theory approach to explain the freedom individuals have with regards to joining a digital network or using a digital service in pursuit of happiness. This theory was chosen because it enabled the researcher to understand why people or mobile service users will prefer to join a digital network even though they are at risk of being adversely exploited. The study adopted a questionnaire to collect data from individuals or respondents in Ghana. Constructs used for this study were validated by monitoring indicator loadings (Hair et al., 2019) whilst hypothesis was tested by assessing the path coefficient for significance (Hair et al., 2019; Urbach and Ahlemann, 2010).

5.4 Research Contributions and Implications

5.4.1 Implication to Research

Previous studies on the digital inclusion and adverse digital incorporation have described this field as promising. As such, they have called for future research to be carried out in order to discover new findings that can add to literature. The study was carried out with this motive to understand and examine the linkages between mobile money services, digital inclusion and adverse digital inclusion. This has greatly been ignored by previous research. The relationship between mobile

money use and adverse digital incorporation, and the mediating role of digital inclusion in mobile money use and adverse digital incorporation has also been under explored. Therefore, this study adds to literature in the field of research on mobile money usage, digital inclusion and adverse digital incorporation.

In addition, this study employed the capability approach theory in order to examine the influence of freedom on the choices people make when considering the use of mobile money services and its effect on digital inclusion and adverse digital inclusion. This is arguably the first study to use the capability theory in the area of mobile money, digital inclusion and adverse digital incorporation altogether. Previous researchers have adopted theories like TAM, UTAUT, and DOI. Therefore, this study adds to existing literature by giving a different perspective.

5.4.2 Implication for Practice and Policy

This study examined the extent to which the use of mobile money services leads to people being digitally exploited (through adverse digital incorporation). The study further investigated the effect of digital inclusion on adverse digital inclusion among mobile money users. Finally, the study examined the mediating role of digital inclusion on the effect of mobile money services on adverse digital inclusion.

In practice, the creation of more suitable and efficient mobile money services will attract more individual to subscribe and use the service, thereby bridging the digital gap. Digital inclusion can promote the use of MoMo which will in turn benefit the service providers.

With regards to policy, findings revealed that more than 80% of the working population in Ghana used mobile money services, however, this has created a large pool of opportunities for digital

exploitation. As a result, the government needs to ensure that network service provides heed to the laws regarding to subscriber privacy to ensure the that personal details and privacy of subscribers tempered with. In addition, the government must also regulate and levy taxes fairly on digital systems to prevent subscribers from feeling exploited. This study therefore encourages the government to pay close attention to mobile money services and service providers to prevent adverse digital incorporation.

5.5 Limitation and Recommendations for Future Research

There are some limitations in this research. The study was conducted in Ghana however, respondents were mainly based in Wa and Accra. Therefore, future studies should be carried out in other regions of the country to provide a comprehensive understanding on the linkages between mobile money service, digital inclusion and adverse digital incorporation. In addition, further studies should be conducted to compare two or more countries, in other to determine how adverse digital incorporation is influenced in those countries. Finally, the study was conducted in Ghana, therefore, findings cannot be generalized to other parts of the world, but the findings share similarities with countries in the African Sub-regions.

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