Investigating Factors that Influence Compliance of Digital Financial Service Agents to Legislation and Standards in Kenya

A dissertation

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ABSTRACT

This study investigated the factors that influence compliance with existing legislation and standards among digital financial services (DFS) agents in Kenya. DFS in Kenya serve 60% of the adult population with at least 16 million subscribers. Much of these are attributable to the mobile money service Mpesa which accounts for the largest DFS market share. The number of DFS agents serving the market has grown to over five times the number of bank branches and ATMs in the country. With this growth in DFS, there have been many operational challenges among agents and the legislation has been at nascent.

The aim of the study was to understand agent operational factors and how they influence compliance. Therefore, the main research question that guided the study was "*How do operational factors affect compliance of DFS agents with agency banking legislation and standards in Kenya*?" Additionally, the study investigated the compliance status among agents and identifiable groupings by compliance behaviour. Previous studies on DFS agents have identified persistent operational challenges but there has been no inquiry on how existing legislation addresses these challenges and whether their persistence is due to non-compliance. To investigate compliance, first, Configuration Theory (CT) was used to conceptualise DFS agents as organisations, classifying their operations under CT's principles of structure, strategy and environment. Subsequently, a conceptual model was developed with structure, strategy and environment as independent variables and compliance as the dependent variable. The first three propositions derived stated that structure, strategy and environment have an influence on compliance. The fourth proposition posed was that strategy has a greater influence on compliance than structure and environment.
Quantitative paper-based questionnaires were used to collect cross-sectional data from 450 DFS agents in Kenya. A Partial Least Squares approach to Structural Equation Modelling (PLS-SEM) was applied to analyse the data on Smart PLS3. All four propositions were confirmed. Structure, strategy and environment had highly significant effects on compliance and strategy had the strongest effect on compliance. The findings suggest that Strategy, which was measured using training and technology utilization questionnaire items plays the biggest role in an agent's operations and compliance. Training equips agents with skills to manage liquidity, offer quality customer service, perform Know-Your-Customer (KYC), Customer-Due-Diligence (CDD) and suspicious transaction reporting (STR) procedures to assist with fraud detection and anti-money-laundering (AML) by identifying counterfeit customer identification documents, cash, and suspicious behaviour. Technologies such as CCTV cameras, counterfeit cash detectors and cash counting machines not only enhance efficiency but support the enforcement of the fraud and AML procedures.

A two-step cluster analysis was performed to classify agents by compliance behaviour. Two distinct clusters emerged. The cluster where majority of agents fell exhibited better training and awareness of existing legislation, higher education levels and financial resources and was compliant with most of the questionnaire items measured. The second cluster with fewer agents was uncompliant on most questionnaire items measured and was characterised by lower education levels, financial resources and training levels. There were commonalities in both clusters which were relatively low scores on legislation awareness, and low compliance scores on liquidity and possession of DFS agent operational manuals.

These findings suggest that an agent with a good alignment of financial and human resources (structure), good training and technology (strategy) and well informed about existing legislation (environment) would be compliant and is likely to experience less operational challenges. The findings also provide insights on what areas agents can take initiative for their own development, the most important being liquidity management, technology optimization

and educating themselves on what legislations apply to them, and their compliance roles and responsibilities. Lastly, the study provides regulators with exploratory findings on the state of compliance among DFS agents in Kenya, indicating which areas agents are having most difficulty with. Banks and MNOs must recognize the crucial role of training and tailor programs to be responsive to all agent's operational and legislative areas.

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List of Abbreviations

AML	Anti-Money Laundering
ANM	Agent Network Managers
ATM	Automated Teller Machines
AVE	Average Variance Explained
CCTV	Closed-circuit television
CDD	Customer Due Diligence
CEO	Chief Executive Officer
CFA	Confirmatory Factor Analysis
CT	Configuration Theory
DFS	Digital financial services
ID	Identification document
KYC	Know-Your-Customer
LM	Linear Regression Model
MAE	Mean absolute error
MDG	Millennium Development Goals
MFI	Micro-finance institution
MNO	Mobile network operator
PLS	Partial Least Squares
POS	Point-of-sale
RMSE	Root mean squared error
SDG	Sustainable development goals
SEM	Structural equation modelling
SIM	Subscriber identification module
STR	Suspicious transaction reporting
UV	Ultraviolet
VIF	Variance inflation factor

1 Introduction

Access to formal financial services has been associated with poverty reduction as a result of improved liquidity which allows more people to participate in economic activities such as investing and saving (Ozili, 2018). Saving, for instance, helps poor households to be more resilient to financial shocks such as loss of income or inflation and could also enable them to start a business (Cull, Gine, Harten, Heitmann, & Rusu, 2018; Jack & Suri, 2011; Van Hove & Dubus, 2019). However, developing countries have had very low rates of access to formal financial services. In 2006, only 18.5% of the Kenyan population had access to formal financial services such as bank accounts (Johnson & Nino-Zarazua, 2011). 43.1% used semi-formal and informal services such as microfinance and rotating savings and credit associations. At least 38.3% had no access to any kind of financial service (Johnson & Nino-Zarazua, 2011).

In order to accomplish the overarching goal of eradicating poverty, global multi-stakeholders comprising of governments, private sector and non-profit organisations have made commitments to make financial services available and affordable to all (Kim, Zoo, Lee, & Kang, 2018). The term financial inclusion broadly refers to "access to and usage of appropriate, affordable and accessible financial services" (Klapper & Singer, 2014, p.6). The argument raised was that if a bottle of Coca-Cola and airtime can feasibly reach remote villages, then financial services could too (Davidson & Leishman, 2010; Dermish, Kneiding, Leishman, & Mas, 2012; Maurer, Nelms, & Rea, 2018). Two enablers to such a venture were identified: high penetration of mobile phones and the presence of retail stores even in the remotest areas (Hughes & Lonie, 2007).

These commitments have borne innovations in financial technology (FinTech) which have made it possible to deliver financial services more widely and at lower costs than traditional banking (United Nations Inter-agency Task Force on Financing for Development, 2019). The outcome has been the launch of digital financial services (DFS) by banks and Mobile Network Operators (MNOs). DFS encompass a range of financial services delivered through phones, cards or via the internet (Ozili, 2018). DFS have three key components: retail agents, the use of a device by agents and customers, and a digital transactional platform (Ozili, 2018). In the same way that Coca-Cola built their supply chain, banks and MNOs now contract small retail stores to act as agents where customers can access the transactional platform from (Dermish et al., 2012). This form of banking is referred to as agent/agency banking or branchless banking (Dermish et al., 2012).

DFS services have made a remarkable contribution to financial inclusion in Kenya since the first service was launched in 2007 (Onsongo & Schot, 2017). As a result, Kenya is often presented as a poster child for DFS success (Burns, 2018; Jack & Suri, 2011). The percentage of the financially excluded population has gone down from 38.5% in 2006 to 17.4% in 2016 (Central Bank of Kenya, FSD Kenya, & Kenya National Bureau of Statistics, 2016). By 2013, the number of DFS agents exceeded the total number of bank branches and Automated Teller Machines (ATMs) in Kenya (Onsongo & Schot, 2017).

Utilizing retail stores as DFS agents has been a strategic move to provide financial services in a more accessible and affordable manner. The most successful DFS initiatives over the past decade have been in countries that have adopted a market-led approach, that is fostering an environment where private firms and entrepreneurs can offer financial services to the poor (Burns, 2018). In Kenya, the market-led approach is evidenced by the actions taken by the Central Bank of Kenya at the inception of the first DFS in Kenya, Mpesa (Hughes & Lonie, 2007). The new mobile service was aligned with the country's goals of deepening financial access and therefore the government allowed Safaricom, a private company, to pilot the service

while the regulator developed the relevant legislation progressively (Hughes & Lonie, 2007). There is no doubt that the model has contributed to a remarkable improvement in financial access in Kenya. However, agents face many persistent challenges including insufficient liquidity, network unavailability, fraud and robbery, inappropriate handling of customer information and lack of training which affect the quality of their service delivery (Githae, Gatauwa, & Mwambia, 2018; Karanja, 2018; Katela, 2017; Njeru & Makau, 2014; Onwonga, Achoki, & Omboi, 2017). In addition, the success witnessed in Kenya with DFS has not been replicated elsewhere (Buku & Meredith, 2013; Dermish et al., 2012; United Nations Inter-agency Task Force on Financing for Development, 2019). Lehman (2010) suggests that the exact reasons why the model has been highly successful in Kenya are not very clear, and it's therefore difficult to replicate and this view is reinforced by Burns (2018).

Transition to accommodate DFS agents in the financial system required changes in financial service regulation. Traditional banking regulation could not apply to DFS (Klein & Mayer, 2011). Among the regulatory changes made, the most pertinent to agents was relaxing Know Your Customer (KYC), Anti-money Laundering (AML), Customer Due Diligence (CDD) and capital requirements to make it feasible for agents to offer the services (Burns, 2018). This approach to legislation has been credited with the difference in success rates of DFS in different countries. Kenya's DFS success is also accompanied by the most flexible agent banking regulatory framework in the world (Burns, 2018). DFS legislation applies to banks, MNOs and agents as they are joint stakeholders in the model, and each has their duties and obligations. Agents are at the frontline of enforcing most of the front-end legislation primarily maintaining liquidity, verifying customer identification documents to prevent fraud, money laundering and terrorism financing, reporting any suspicious transactions and solving or escalating customer complaints appropriately (Central Bank of Kenya, 2010, 2013, 2014). DFS legislation is meant to deepen financial access while protecting the stability of the entire financial system and safeguarding customers (Triki & Faye, 2013). Agent compliance to these set of legislations protects all stakeholders. For regulators and policymakers in Kenya and elsewhere, compliance would also be an indication of how effectively DFS legislation is working to support financial inclusion goals.

Previous studies have mostly applied a topical approach to studying agent issues such as identifying challenges (Atandi, 2013; Katela, 2017), fraud risk management practices (Karanja, 2018) and agents' role in promoting adoption of DFS by customers (Githae et al., 2018; Njeru & Makau, 2014). This means looking at the topic of concern in a fragmented manner and not offering much insight on how other areas of an agent's business affects these topics. As a result, there is a lack of a comprehensive picture in existing literature of how agent businesses are structured, resourced and their awareness of and adherence to existing legislation. This lack of knowledge potentially hinders the recommendation of lasting solutions to persistent challenges and a clear-cut explanation of Kenya's DFS success and how it can be replicated.

To conceptualise agent businesses holistically, concepts from organisational management were applied for this study. Organisational operations fall within a set of structure, strategies and external environment (Miller, 1981; Miller & Toulouse, 1986). Structure entails resources, tasks and management; strategy entails unique adaptive mechanisms organisations employ to stand out from competitors; and environment entails competition, rules and regulations (Miller, 1986). Most successful organisations tend to aim at attaining an optimal balance among aspects of structure, strategy and environment to achieve desired organisational outcomes such as competitive advantage or other performance outcomes (Miller, 1999). It is a requirement in Kenya for DFS agents to have a registered business before being contracted to offer DFS (Katela, 2017). With the view of agents as organisations, this study develops a conceptual model that explores agent business structure, strategy and environment. Further, agents'

compliance status to existing legislation is examined as a desired outcome influenced by structure, strategy and environment.

1.1 Problem Statement

Despite the crucial role agents play as the last mile delivery channel for DFS, they have not received much attention from researchers compared to other DFS stakeholders such as banks, MNOs and customers (Peša, 2018). Existing literature merely highlights the pertinent challenges among DFS agents. There has not been much attempt to evaluate agent operations against existing legislation to find out whether persistence of some of the challenges highlighted above is due to non-compliance. The risks associated with agency banking are mainly operational and are manageable with the application of prudent systems and controls (Dermish et al., 2012). Since there are legislation and standards offering guidelines for agents' operations, compliance to them ought to abate DFS agents' operational challenges. However, it has been recounted that some agents operate under very lax control systems (Akomea-Frimpong, Andoh, Akomea-Frimpong, & Dwomoh-Okudzeto, 2019). Additionally, since DFS legislation is already a lighter version of standard financial regulation (Johnson, 2016; Mugo, 2012), it would be important to know whether it is being adhered to as it is a bare minimum, as well as how all organisational factors affect compliance.

The next section presents the research questions posed by this study with the aim of understanding agent businesses and their compliance behaviour.

1.2 Research Questions

The study was guided by the following main research question

How do operational factors affect compliance of DFS agents with agency banking legislation and standards in Kenya?

The following sub-questions were used to answer the primary research question

RQ1. What influence does the business structure of a DFS agent have on compliance?

This question provided an understanding of how an agent's business structure and resources affect compliance.

RQ2. What influence does the strategy of a DFS agent have on compliance?

The purpose of this question was to examine the key strategies agent businesses employ and how they affect compliance.

RQ3. What influence does the environment of a DFS agent have on compliance?

This question explored the external environment prevailing over agent businesses and how it affects their compliance.

RQ4. What are the common archetypes by compliance status among digital financial service agents in Kenya?

This question sought for key characteristics of agents and insights on how an agent's profile relates to their compliance status.

1.3 Research Objectives

In line with the research questions outlined above, the objectives of this study are:

RO1. To determine the effect of operational factors on DFS agents' compliance with agency banking legislation and standards in Kenya.

RO2. To identify and compare the influence of structure, strategy and environment on compliance.

RO3. To identify common agent profiles and their relevance to compliance.

1.4 Dissertation Outline

This study is structured as follows:

Chapter 1: Introduction

This chapter introduces the study, the background and motivation for the study. It also presents the problem statement, research questions, objectives and the outline for the rest of the dissertation.

Chapter 2: Literature Review

This chapter delves deeper into the contextual background of DFS in Kenya and other contexts, challenges identified by previous studies and the existing legislation. Further, Configuration Theory is applied as the lens through which agent business elements are categorized to fit an organisational structure. Subsequently, a conceptual model is developed from which propositions for this study are derived.

Chapter 3: Research Design and Methodology

This chapter presents the ontological and epistemological stances adopted as well as the methodology. The development of the instrument and construct operationalization is discussed. Further, the sampling and data collection methods used are presented.

Chapter 4: Data Analysis and Results

The techniques and tools used to analyse data are outlined in this chapter as well as the results from the analysis.

Chapter 5: Findings and Discussion

The findings of the study are discussed in relation to the research questions posed and in the context of existing literature.

Chapter 6: Conclusion, Limitations and Recommendations for Future Research

This chapter concludes the entire research with final remarks based on the findings, limitations of the study, implications to theory and practice and recommendations for further research.

2 Literature Review

2.1 Introduction

This chapter begins with a description of the approach taken to conduct the literature review, how the literature was obtained and sorted. Next, the historical background of DFS in Kenya and the various DFS models are discussed. The theoretical background of the proposed model is presented. Agent characteristics and challenges from extant literature are discussed in line with Configuration Theory concepts. Further, the proposed conceptual model is presented, and study propositions derived. Finally, the chapter presents gaps identified in literature and a summary.

2.2 Systematic Literature Review

Various types of literature review can be distinguished by the aim of the review as well as the methodology applied to collect and analyse literature (Oosterwyk, Brown, & Geeling, 2019). The common types are narrative, descriptive, scoping, meta-analysis among other classifications (Oosterwyk et al., 2019; Paré, Trudel, Jaana, & Kitsiou, 2015). A systematic literature review documents the steps used to acquire and synthesise, as well as a summary of all relevant literature collected in relation to the research question (Kim et al., 2018; vom Brocke et al., 2015). There has been a growing interest in the Information Systems (IS) discipline to conduct systematic literature reviews to assure the clarity, quality and replicability of studies (Oosterwyk et al., 2019; vom Brocke et al., 2015).

There are five stages of synthesizing literature: (1) Defining the protocol, (2) Searching databases, (3) Selecting papers, (4) Analysing, synthesizing and interpreting, and (5) Writing the review (Oosterwyk et al., 2019). Key concepts, scope of the study and the type of literature review are defined at the first stage (Okoli, 2015). A scoping review was selected for this study. This type of literature review is usually conducted to establish the extent to which a certain topic has been covered. Although it shares in the criticism of narrative and descriptive literature reviews for being broad but not deep in coverage, scoping reviews are more comprehensive and suitable for identifying gaps in extant literature (Paré et al., 2015). At the selection stage, peer-reviewed articles were prioritised with the exception of three non-published dissertations on grounds of being very recent empirical studies carried out among agents in Kenya. Such exceptions are permitted if the articles are topic-focused (Oosterwyk et al., 2019). Figure 2-1 presents a summary of the search and selection process and results. The list of articles is attached as **Appendix A**.

Thematic analysis was chosen for the synthesis which is consistent with scoping reviews (Paré et al., 2015). Thematic analysis enables researchers to identify and classify patterns into themes which helps to unravel any hidden reality (Akomea-Frimpong et al., 2019). It involves coding the text based on related issues, grouping codes into meaningful concepts (themes) (Thomas & Harden, 2008). Nvivo software was used to facilitate the coding process and the themes identified are presented in Table 2-1. The timeline selected was from 2006 when the first DFS was piloted in Kenya.

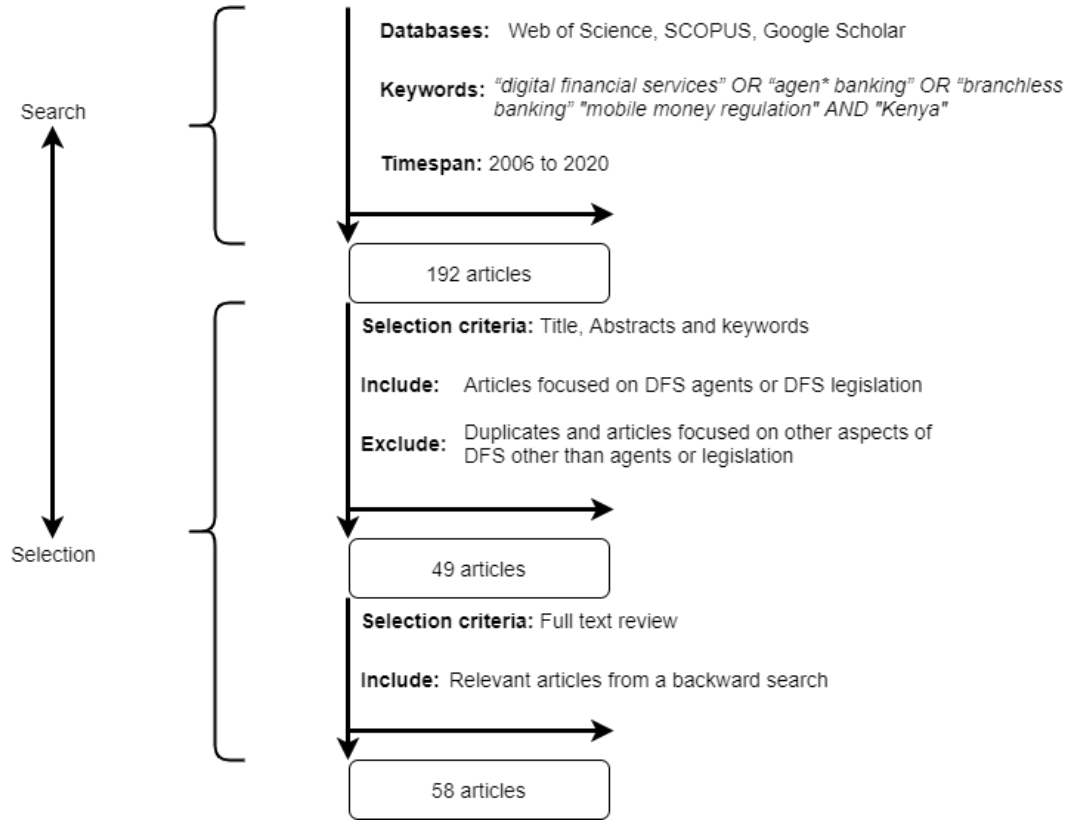

Figure 2-1: Search and selection process. Adapted from (Oosterwyk et al., 2019)

Table 2-1 Summary of descriptive themes and sources

Theme	**Sources**
Agent characteristics and roles	(Buku & Meredith, 2013; Cull et al., 2018; Dermish et al., 2012; di Castri & Gidvani, 2014; Eijkman, Kendall, & Mas, 2010; Ghosh, 2013; Gibson, Lupo-Pasini, & Buckley, 2015; Githae et al., 2018; Hughes & Lonie, 2007; Jack & Suri, 2011; Khattab, Balola, & Eldabi, 2012; Kim et al., 2018; Malek, Mohtar, & Shabudin, 2017; Maurer et al., 2018; Muthiora, 2015; Njeru & Makau, 2014; Rahman, 2019; Rea & Nelms, 2017; Wachira, 2018)
Financial inclusion	(Alexandre, Mas, & Radcliffe, 2011; Buku & Meredith, 2013; Cull et al., 2018; Ghosh, 2013; Groppa & Curi, 2016; Karanja, 2018; Maurer et al., 2018; Rachmawati, Farda, Rijanta, & Setiyono, 2019)
Agent challenges	(Akomea-Frimpong et al., 2019; di Castri & Gidvani, 2014; Githae et al., 2018; Greenacre, 2015; Jack & Suri, 2011; Karanja, 2018; Katela, 2017; Kim et al., 2018; Malek et al., 2017; Morawczynski & Miscione, 2008; Njeru & Makau, 2014; Onwonga et al., 2017; Peša, 2018; Rea & Nelms, 2017; Wachira, 2018)
Agent-financial provider relationship	(Alexandre et al., 2011; Eijkman et al., 2010; Gibson et al., 2015; Klein & Mayer, 2011; Maurer et al., 2018)
Regulation and standards	(Alexandre et al., 2011; Buku & Meredith, 2013; Cull et al., 2018; Dermish et al., 2012; di Castri & Gidvani, 2014; Finau, Rika, Samuwai, & McGoon, 2016; Gibson et al., 2015; Hughes & Lonie, 2007; Jenik & Lauer, 2017; Karanja, 2018; Klein & Mayer, 2011; Muthiora, 2015; Nyaga, 2014; Rea & Nelms, 2017; Wachira, 2018)
Training	(Akomea-Frimpong et al., 2019; Githae et al., 2018; Karanja, 2018; Khattab et al., 2012; Maurer et al., 2018; Njeru & Makau, 2014; Wachira, 2018)
Inter-country experiences	(Cull et al., 2018; Khattab et al., 2012; Malek et al., 2017; Peša, 2018; Rachmawati et al., 2019)

2.3 Literature review

The literature review section ahead first presents the DFS background then a description of agents, their activities and challenges. Next, DFS legislation in Kenya is discussed followed by the role of training and comparative experiences of DFS agents in other countries. Agency theory is then used to explain the challenge of compliance for DFS agents. Finally, configuration theory is applied to develop a conceptual model to guide the study. Propositions are derived from the model and a summary of the chapter is presented.

2.3.1 DFS Background

In September 2000, three months before the beginning of the 21st Century, 189 countries met at the United Nations Headquarters in New York and committed to "spare no effort to free our fellow men, women and children from the abject and dehumanizing conditions of extreme poverty" (United Nations, n.d., para. 3). This statement, also known as the Millennium Declaration, was operationalised through eight Millennium Development Goals (MDGs) of which the first was dedicated to eradicating poverty and hunger. The connection between poverty, decent work and hunger was drawn and MDG1 was targeted at addressing all three. By 2011, all other regions except Sub-Saharan Africa had achieved the target of halving the population living in extreme poverty (MDG Monitor, 2017). It was clear that the only meaningful way out of poverty was strong economies which among other things provided jobs and reliable income (World Bank, n.d.). Building on the vision and milestones of the MDGs whose mandate ran up to 2015, a new development agenda was formulated and adopted that had at its core seventeen Sustainable Development Goals (SDGs) (United Nations, n.d.).

SDG1 is dedicated to eradicating poverty in all forms (United Nations, n.d.). One of the factors that have been found to contribute to poverty reduction and stimulate economic growth is access to formal financial services (Beck, Demirguc-Kunt, & Levine, 2005; Binswanger & Khandker, 1995; Burns, 2018; Morduch, 1994). The main limitation for traditional banking to service marginalized areas was the cost of building and running bank branches which is not profitable in areas characterised by high volume and low value transactions (Onsongo & Schot, 2017). That limitation was overcome by the advent of agency banking. By using agents, banks cut on costs of building brick and mortar branches which are a huge expense (Alexandre et al., 2011; Maurer et al., 2018). Using existing business's infrastructure provides a cheaper, less formal and convenient alternative for customers. Besides proximity to clients, agents are also open for longer hours and it takes less time to transact at an agent than it does at a bank branch (Cull et al., 2018). The ubiquity of retail stores enables them to reach underserved population segments especially the rural areas where there are fewer or no bank branches (Cull et al., 2018). However, even agency banking is not flawless as it has been observed that the asymmetric distribution typical of traditional banks that favours urban areas to the disadvantage of rural areas is also reflected in DFS agent distribution (Kodongo, 2018; Rachmawati et al., 2019).

From a regulatory perspective, DFS innovation preceded the enactment of legislation to govern it (Muthiora, 2015). The earliest DFS offerings in front runners such as Kenya and Tanzania were allowed to launch with non-objection letters and regulators used emerging lessons to amend existing banking legislation and enact new ones (Dermish et al., 2012; di Castri & Gidvani, 2014; Hughes & Lonie, 2007). Generally, the regulatory landscape varies greatly across jurisdictions but DFS has been most successful in markets where regulators have intentionally fostered an enabling environment to allow DFS to deepen financial inclusion (di Castri & Gidvani, 2014).

2.3.2 DFS Agents

Agents are small retail stores contracted by banks and Mobile Network Operators (MNOs) to offer financial services to the community (Dara, 2018; Dermish et al., 2012). The business owners or staff employed at retail outlets are also usually referred to as agents (Eijkman et al., 2010. The view predominantly taken in this study is based on the first definition that regards agents as businesses and not the individuals that operate them. The references made to agent staff or business owners considers them human resources of the agency business. Banks and MNOs are the two principal stakeholders on the supply side of agency banking and the customers on the demand side. Agency banking derives its name from the use of agents. This form of 'banking' is also referred to as branchless banking, as customers no longer need to visit brick and mortar bank branches to transact (Dermish et al., 2012). Banks and microfinance institutions (MFIs) operate under prudential financial regulation which requires specified capital thresholds and risk control and until the advent of mobile money had been the only institutions licenced to offer financial services (Onwonga et al., 2017). Mobile money is an innovation by MNOs that provides financial services through mobile wallets attached to customers' Subscriber Identification Module (SIM) card number (Rea & Nelms, 2017). Banks responded to the competition by tailoring traditional banking services to be offered through digital platforms as well. Financial services offered through agents have been collectively referred to as Digital Financial Services (DFS) because they involve the use of technologies such as phones and network connectivity to access (Dara, 2018).

Agents operate under two models. The first is the bank-led model where prudentially regulated banks tailor their products to be delivered through retail agents on the bank's behalf (Khattab et al., 2012). The non-bank-led model involve MNOs who are not prudentially regulated but are licenced to offer cash-in cash-out financial services through retail agents (Gibson et al., 2015; Greenacre, 2015; Khattab et al., 2012). In most jurisdictions including Kenya, agents are free to offer both bank and MNO services simultaneously (Dermish et al., 2012).

i. Agent characteristics and roles

Agents typically operate other businesses apart from agency services which range from kiosks, supermarkets, pharmacies, gas stations, lottery outlets amongst others. (Cull et al., 2018; Eijkman et al., 2010; Gibson et al., 2015; Maurer et al., 2018). Successful agents are local retailers trusted by the community based on their reputation, the success of their main business as well as the safety of their business location (Ghosh, 2013; Rahman, 2019). The main responsibility for DFS agents is to facilitate cash-in cash-out transactions (Khattab et al., 2012; Maurer et al., 2018; Njeru & Makau, 2014). Additional roles include recruiting and registering new customers and front-line customer service helping customers learn how to use the service and initiate transactions (Maurer et al., 2018). They also troubleshoot customers' problems. They are expected to verify customers' identity before offering the services (Khattab et al., 2012). In exchange for their services, agents earn a commission based on the value and volume of the transactions they carry out (Cull et al., 2018; Dermish et al., 2012; Eijkman et al., 2010).

Studies show that generally, most agents have been in the business for one to five years (Karanja, 2018; Rachmawati et al., 2019). Older agents tend to be more established and trusted than new ones (Maurer et al., 2018). Older agents therefore get larger and more consistent customer traffic. On the other hand, newer agents are more likely to be more tech-savvy and may be capable of delivering better service to customers (Cull et al., 2018). Majority of agents are college and secondary school graduates (Eijkman et al., 2010). This could be the case because higher levels of education are likely to create more formal employment and thus such individuals are less likely to be in the informal sector where DFS operates (Eijkman et al., 2010). It is difficult to predict the impact of the education level of agents but better-educated

agents are more likely to be trusted or better equipped with skills to run the business than their less-educated counterparts (Cull et al., 2018). However, that does not always hold as Eijkman et al. (2010) documented an example of an agent who did not complete primary school education but was running multiple successful DFS agent shops. In such cases, the observation is that the agents possess experience from running other businesses before DFS services and are particularly well versed with liquidity management and customer service (Eijkman et al., 2010).

To manage the vast number of agents, banks and MNOs sometimes use "aggregators" or "master agents" who are agents with the capacity to appoint and manage other agents (sub-agents) (Jack & Suri, 2011; Muthiora, 2015; Wachira, 2018). This helps banks and MNOs to scale their agent networks (di Castri & Gidvani, 2014). Relying on aggregators reduces the supervision burden on MNOs and banks as they can have oversight of thousands of sub-agents through one aggregator (di Castri & Gidvani, 2014).

Agents are at the core of DFS. They are sometimes referred to as human ATMs for their cash-in cash-out role. They've been referred to as infrastructure, a network, or bridges (Eijkman et al., 2010; Maurer et al., 2018; Peša, 2018). The knowledge of an agent about his immediate community is valuable, especially to carry out Know Your Customer (KYC) and Customer Due Diligence (CDD) (Cull et al., 2018). Given these social roles, questions have been raised about whether it is appropriate to perceive them merely as channels. Agents are critical elements, social creatures whose tacit knowledge of their community is valuable to DFS enterprise (Maurer et al., 2018).

ii. Agent-financial provider relationship

The agent-financial provider relationship is a symbiotic one where retail stores make extra income while banks and MNOs extend their services without incurring the cost of building branches (Maurer et al., 2018). Since agents are remunerated for their cash-in cash-out transactions, some practitioners have viewed them as channels, intermediaries and even avoided calling them agents but rather cash merchants or independent contractors (Alexandre et al., 2011; Eijkman et al., 2010; Gibson et al., 2015; Klein & Mayer, 2011). Others have argued that agents are mediators since their roles are not limited to cash-in cash-out transactions but extend to promoting DFS in their communities through branding and advertising, thereby serving as mediators between financial service providers and underserved communities (Maurer et al., 2018).

iii. Agent challenges

Banks, MNOs and agents grapple with various issues. On the part of the financial service providers, challenges involve how to scale their agent network, recruitment of reliable agents, and incentivizing agents to make it profitable for them to offer dedicated service (Maurer et al., 2018). Among agents, the most commonly cited challenge is liquidity management (Atandi, 2013; Cull et al., 2018; Eijkman et al., 2010; Gibson et al., 2015; Greenacre, 2015; Jack & Suri, 2011; Karanja, 2018; Malek et al., 2017; Maurer et al., 2018; Mungai, 2016; Njeru & Makau, 2014; Rea & Nelms, 2017; Wachira, 2018). It is not only a persistent challenge but also one that cuts across all contexts from Sub-Saharan Africa, South America and the Middle East and South East Asia.

Some of the approaches used to address liquidity challenges include using aggregators as these 'master agents' supply their sub-agents with cash and float (di Castri & Gidvani, 2014). Older agency businesses are reported to have better liquidity management skills as they learned how to anticipate demand and plan for their cash and float balancing in advance. They are also more

likely to have established relationships with stakeholders such as aggregators or banks who can advance float to them during their peak demand (Wachira, 2018).

In cases where the commission is small, agents often have to rely on their other business activities to make ends meet (Rea & Nelms, 2017). Agents often multitask between their retail business and agency services and the higher the demands from the retail business, the more difficult it is for the agent to be fully dedicated to DFS (Cull et al., 2018; Ghosh, 2013). Besides, agents typically operate for longer hours than banks yet agent employees are poorly paid and rarely have formal employment contracts (Peša, 2018). Agents in rural areas face additional challenges as their commissions are typically lower due to lower transaction volumes. In addition, they spend more time and money making trips to bank branches to balance their float (Eijkman et al., 2010).

Other challenges mentioned are summarized in *Table 2-2*.

Table 2-2: Summary of additional challenges

Challenge	Description	Source(s)
Confidentiality of customer information	Some agents are not aware of the restrictions on disclosure of customer information	(Malek et al., 2017; Onwonga et al., 2017)
Lack of requisite skills	Some agents lack the key competencies for running a DFS business such as operating a small business, liquidity management and good customer service	(Kim et al., 2018; Malek et al., 2017)
Barriers to entry	The capital required to start is difficult to raise for many to and also having to register separately with each bank or MNO is time consuming.	(Atandi, 2013; Eijkman et al., 2010; Katela, 2017; Rea & Nelms, 2017)
Security	The main security risk is robbery attacks due to having cash on premises without enhanced physical security measures.	(Akomea-Frimpong et al., 2019; Jack & Suri, 2011; Mungai, 2016; Njeru & Makau, 2014; Wachira, 2018)
Poor handling of customer complaints	Problems can arise when agents do not follow the laid-out procedures for escalating customer complaints.	(Njeru & Makau, 2014)
Fraud	Agents face risks of being defrauded by customers particularly trying to withdraw money based on fake messages or presenting counterfeit cash notes.	(Greenacre, 2015; Karanja, 2018; Wachira, 2018)
System downtimes and network unavailability	Some areas suffer from poor telecommunication network connections. Also, sometimes the bank or MNO systems could be down. Both issues affect transactions and service to customers.	(Atandi, 2013; Greenacre, 2015; Morawczynski & Miscione, 2008)
Lack of training	Some agents are not trained at all before assuming their role and some who are don't consider the training that they received to be enough.	(Githae et al., 2018; Karanja, 2018)
Lack of appropriate technology	In most cases, agents don't have the kind of technology used by bank tellers to count money and identify counterfeits	(Akomea-Frimpong et al., 2019; Githae et al., 2018)

2.3.3 DFS regulation and compliance

The role of regulators in agency banking is to address risks that the innovation poses and to come up with ways of protecting customers and the entire financial system. Such mitigation ought to include best practices in liquidity management, customer identification, anti-money

laundering and terrorist financing procedures; platform interoperability and market competition (Rea & Nelms, 2017). At the time the first DFS was launched in Kenya in 2007, there was no legislation governing financial transactions outside traditional banking (Buku & Meredith, 2013; Muthiora, 2015). The Central Bank of Kenya made a conscious decision to take a 'test and learn' approach that embraced innovation and developed legislation incrementally, rather than stick to traditional legislation which would not have allowed DFS to launch at the time (Hughes & Lonie, 2007; Jenik & Lauer, 2017).

The first DFS 'Mpesa' was given a no-objection letter, and subsequently, several legislative acts were amended or constituted to govern both bank-led and MNO-led DFS (Hughes & Lonie, 2007). Kenya's so-called 'light touch' regulatory regime has been credited as a key factor for the high adoption and success of DFS in Kenya (Johnson, 2016). Strict requirements for agents would be a barrier to entry and therefore counteractive to financial inclusion efforts (Munoru, 2016). *Table 2-3* presents the legislation and summarizes the clauses that have direct implications for agents (Central Bank of Kenya, 2010, 2013, 2014).

Table 2-3: DFS legislation in Kenya

Name of Legislation	Broad Overview	Implications for agents
Proceeds of Crime and Anti-Money Laundering Act 2009	Defines money laundering and other related criminal activities	• Obligation to verify identity of customers • Obligation to identify and report suspicious transactions
E-Money Regulation 2013	Authorizes the issuing of electronic money, prescribes requirements for e-money issuers appointment of agents	• Compliance with Proceeds of Crime and Anti-Money Laundering Act 2009 • Report incidents of theft, robbery or fraud
National Payment Systems Regulations of 2014	Allows MNOs to appoint agents and states that MNOs are responsible for the actions of their agents. Requires mobile money providers to hold in trust customer funds in prudentially regulated banks Prohibits exclusive contracts between MNO/bank and agents	• Freedom to work with multiple banks and MNOs • Sufficient liquidity for each of the services offered • Requirement to be adequately trained and supported by the bank/MNO including being provided with agent manuals that contain policies and guidelines for safe and efficient customer service • Responsibility for privacy and confidentiality of customer data • Requirement to disclose terms of service such as transaction charges and customer care numbers for complaint redress • Security measures at the agent's premises

Klein & Mayer (2011) observed that policymakers across countries in Africa, Asia and Latin America where DFS had been adopted were struggling, attempting to adapt traditional banking legislation for DFS models without first outlining the differences between the two. There's a lack of synchronicity and some overlaps in the legislation which has been attributed to the learning curve (Buku & Meredith, 2013). The Central Bank of Kenya did not have other regulatory frameworks to refer while developing DFS policies as Mpesa was the earliest MNO-led DFS globally (Muthiora, 2015; Nyaga, 2014). Nevertheless, there didn't emerge with time any universal best practices and regulators in various jurisdictions had to experiment to see what works in their context while ensuring that minimum standards of KYC, AML and consumer protection were being adhered to (Alexandre et al., 2011).

Legislative Acts outline guidelines for all DFS stakeholders. Those specific to agents require them to: accurately perform KYC, CDD and AML procedures, provide clear transaction fee schedules and customer complaint escalation procedures, record all transactions in a logbook

and report any suspicious activity (Cull et al., 2018; Dermish et al., 2012; di Castri & Gidvani, 2014; Gibson et al., 2015; Nyaga, 2014).

Agents are supposed to receive unannounced monitoring visits to ensure compliance and to provide suggestions for improvement (Cull et al., 2018; Karanja, 2018; Njeru & Makau, 2014). Agents reported that the monitoring visits were less frequent than outlined in the guidelines and the support less forthcoming (Cull et al., 2018; Karanja, 2018). Some of the monitoring gaps have also been attributed to regulators' lack of experience in managing DFS agent networks (Dermish et al., 2012). Some studies have reported that MNOs have better monitoring systems and mechanisms than banks (Finau et al., 2016; Karanja, 2018; Wachira, 2018).

2.3.4 Training

Some of the challenges have been attributed to the fact that agents are not trained on the same standards as bank tellers yet their responsibilities are very similar (Githae et al., 2018). Agents need training on how to carry out transactions, manage liquidity, attract and register new customers, perform KYC and CDD and prevent fraud (Maurer et al., 2018). Such training is not a one-time event (Maurer et al., 2018; Njeru & Makau, 2014). Training has been identified as a challenge and some agents have indicated their dissatisfaction in the training offered by their financial providers (Akomea-Frimpong et al., 2019; Karanja, 2018). Resources and training material have been limited and in some instances, agents have been asked to pay to attend the training which has been a hindrance for some to get trained (Akomea-Frimpong et al., 2019). Some agents have to learn on the job, totally unaware that banks and MNOs are supposed to train them (Akomea-Frimpong et al., 2019; Karanja, 2018). Follow-up and niche training to address some of the common challenges such as liquidity management is reportedly lacking (Githae et al., 2018; Wachira, 2018).

Lack of training exposes agents to float mismanagement, fraud and poor customer handling all which pose risks to the success of DFS (Githae et al., 2018; Khattab et al., 2012; Njeru & Makau, 2014). Regular in-store monitoring is also supposed to accompany training, to ensure agents are adhering to the required procedures and are properly branded (Karanja, 2018; Maurer et al., 2018; Njeru & Makau, 2014). Effective training requires intensive needs assessment and tailoring a training program to address the needs (Njeru & Makau, 2014). Using Agent Network Managers (ANM) is one approach that some MNOs have used. ANMs are specialized organisations that can be outsourced to recruit, train and manage agents (Karanja, 2018).

2.3.5 Experiences from other countries

Agents in the Democratic Republic of Congo have the most comprehensive package in Africa and receive a magnitude of support from their principals than any other country in Africa (Cull et al., 2018). The financial provider caters for their initial setup including the cost of technology and float. That approach comes at a greater cost, but the financial provider retains control over the agent's liquidity, branding and quality of customer service (Cull et al., 2018). They also have 'roving' agents who instead of having a fixed location are itinerant, covering mostly rural areas (Cull et al., 2018). The same approach is taken by banks in Sudan, Brazil, Pakistan, India and South Africa (Khattab et al., 2012). In these contexts, financial providers not only maintain close oversight on agents but are also accountable for the agent's misconduct.

Although there are operational and oversight differences in different countries, there are many shared commonalities. In all contexts, agent eligibility considers the ownership of a primary business and the length of time the business has been operational, as well as their reputation in the community.

2.4 Summary of DFS Literature

Agents are a core stakeholder in the DFS ecosystem, the main actors in the field playing the crucial function of facilitating transactions for customers and promoting the adoption of DFS (Kim et al., 2018). Their status in the community is crucial to DFS as it is the face and the foundation of trust in the entire DFS system (Rahman, 2019; Rea & Nelms, 2017). The number of agents has grown to over five times the number of bank branches and ATMs (Buku & Meredith, 2013). Unlike ATMs and bank tellers, there are activities agents carry out that are crucial to keeping the DFS popular amongst customers. For instance, some agents share their personal phone numbers with customers so that they can call in advance and find out whether the agent is available and in a financial position to carry out transactions (Ghosh, 2013). Other agents keep an extra phone to be used by customers who possess SIM cards but do not have phones. Trust systems have been established such that some customers can leave cash with agents during system downtimes for the transactions to be completed later (Ghosh, 2013). This saves customers from making unfruitful trips to an agent's shop. Such efforts are beyond what the principals mandate agents to do but increase convenience for customers and improve customers' experience. These informal practices are a crucial driver of DFS success (Ghosh, 2013).

Despite their crucial role in the ecosystem, agents have received very little attention compared to other stakeholders such as banks, MNOs and customers (Peša, 2018). Much of the literature merely describe agents' characteristics, some even viewing them as passive distributors, channels or bridges (Cull et al., 2018; Peša, 2018). The characteristics and roles presented from literature do not portray agents as mere channels or passive distributors of DFS which would imply their dispensability, but rather, they appear to be crucial, indispensable actors to the model. It is therefore concerning that agents haven't received commensurate attention from researchers to understand them better.

Out of the 58 papers reviewed, only 6 had a core focus on agents, including having agents as respondents. Only 3 had agents as the only respondents. The other 3 had agents alongside other respondents such as bank and MNO representatives and customers. The objectives of 5 of the studies were not dedicated to understanding agents but rather needed agent input to understand other phenomena such as general agent challenges (Atandi, 2013), fraud risk management practices (Karanja, 2018), liquidity management (Wachira, 2018), DFS adoption (Githae et al., 2018), and financial inclusion (Rachmawati et al., 2019). Only Peša (2018) went to depths of understanding agent profiles, skills, labour relations, various challenges, the role of experience and training. Peša's (2018) was also the only qualitative study, which provided detailed agent experiences, attitudes and opinions. Agents have been treated as peripherals and have even been referred to as passive distributors of the service, "…a channel rather than an actor…" (Foster & Heeks, 2013, p. 298).

There are many aspects of DFS that are yet to be fully understood such as the persistence of certain challenges, the most efficient way to run an agent network, solutions for disparities in DFS access in rural areas et cetera. Deeper engagement with agents as has been invested in other stakeholders holds a lot of potential for a wholesome understanding and improvement of the DFS model. This study, therefore, seeks to contribute in that area by obtaining typical agent profiles based on agent business characteristics and disposition towards the regulatory requirements applicable to them. Agents' compliance status provides a preliminary picture of where some of the persistent challenges stem from.

2.5 Theoretical Literature Review

This section positions DFS agents in the context of relevant theories and concepts that provide a theoretical foundation for the development of a conceptual model.

2.5.1 Agency Theory

An agent is "any person or thing that is capable of action" (Maurer et al., 2018, p.56). conventionally, the term agent is used to refer to one who acts on behalf of another. This is more in line with the legal definition of agency. Retail stores are appointed by financial providers to carry out stipulated activities in exchange for a commission (Maurer et al., 2018). In the DFS context, the retail stores become agents and the financial service providers become principals (Munoru, 2016). Agency theory holds that when a principal delegates work to an agent, the agent acts on behalf of and for the benefit of the principal (Eisenhardt, 1989). Several problems arise in the agency relationship. The first is conflicting self-interests. Each party tries to maximize the benefits of the relationship (Eisenhardt, 1989). Banks and MNOs use agents to cut the cost of establishing branches (Maurer et al., 2018). Retail stores sign up as agents for several reasons. The first incentive is the commission earned from facilitating transactions. Secondly, offering DFS services has been found to improve foot traffic to the shop which leads to increased sales in the agent's primary business (Eijkman et al., 2010; Mungai, 2016). The branding by financial service providers also improves the public image of the retail store from association with big brands (Eijkman et al., 2010; Gitonga & Kiraka, 2019).

Information asymmetry is the other challenge that arises in agency where the agent has more information about operating the business than the principal (Jensen & Meckling, 1976). This increases the chances of agents exploiting loopholes. For example, some agents split deposits into multiple transactions which do not cost the customer anything since deposits are free but it earns the agent more commission for an increase in transaction volume (Mungai, 2016). In a cost-benefit scenario, an agent has no intrinsic benefit in strictly enforcing KYC procedures since it means turning back customers without proper identification which is a loss of income to the agent (Alexandre et al., 2011). Principals typically limit exploitation from agents by offering agents incentives and also investing in monitoring the agent to discourage aberrant behaviour (Jensen & Meckling, 1976; Munoru, 2016). Since banks and MNOs are liable to the regulators for the actions of their agents, they (principals) hold the agent responsible through service level agreements and contracts (Wachira, 2018).

Agency theory has been criticized for the assumption that no agent is trustworthy and will take every opportunity to benefit themselves at the expense of a principal. In reality, there are many trustworthy agents who work to create a win-win situation for themselves and the financial service providers, regardless of their behaviour being monitored (Mungai, 2016; Wachira, 2018). While it offered vital perspectives for understanding agent and principal behaviours, agency theory did not provide a framework that can be operationalized to examine compliance empirically. Configuration Theory discussed in the next section was used to develop a conceptual model for this study.

2.5.2 Configuration Theory

Configuration Theory (CT) has its roots in organisational development and strategic management and is applied to understand organisations. Miller (1986) is a proponent of using CT to analyse organisational issues and find the best contextual solutions. Organisations comprise of parts and processes. Configurational theorists suggest that the best way to understand an organisation is from viewing it as an assemblage of interconnected elements (Fiss, 2007). CT posits that there is a limited number of ways in which business elements can be combined to produce an optimal outcome. These combinations are known as configurations or gestalts (Miller, 1986). High-performing organisations show predictively useful combinations of elements in their strategy, structure and environment. Therefore, understanding the elements that constitute an organisation's strategy, structure and environment provides a good predictor of performance.

Strategy and structure are internal while environment is external comprising of elements such as competition and innovation. Figuring out the best combination of strategy and structure helps organisations thrive in any type of environment (Miller, 1986). Failure to deal with environmental aspects is detrimental to an organisation as competitors with superior strategies for instance could drive an organisation out of business. Organisations develop adaptive strategies that correlate with their structural and environmental dispositions (Miller, 1986). Strategies mostly relate to innovation and broadening the product line. The environment is comprised of competitors as well as rules and regulations. Structure relates to tasks and how they are shared and supervised.

CT has been applied in various fields and for different objectives including appraisal for methods used to select archival records (Lemieux, 1998), assessing staff performance in crisis response (Biermann, 2016), the impact of supply chain integration on business performance (Flynn, Huo, & Zhao, 2010), purchasing alignment (Mikalef, Pateli, Batenburg, & Van De Wetering, 2015) and CEO personalities impact on firm performance (Miller & Toulouse, 1986). The unique perspective CT provides is describing organisations as a set of interrelated activities (Flynn et al., 2010). This provides a capability to handle complex relationships that other approaches may not, often due to reductionism of all variables to pairwise relationships (Flynn et al., 2010). Alternative approaches in Information Systems (IS) fall into two categories: variance and process theories (El Sawy, Malhotra, Park, & Pavlou, 2010). Variance theories consider each cause to have an independent effect which can be predicted by one or more variables (Mikalef et al., 2015). This translates to unifinality, which is the view that an outcome can only be caused by a specific set of predictors. Limitations of variance theories therefore arise in cases where boundaries among elements are fuzzy and there is mutual causality (El Sawy et al., 2010). Process theories are helpful in explaining change in a variable over a period of time and what contributed to or caused that change (Mikalef et al., 2015). While they are good at explaining the 'how' of a phenomenon, process theories are also not suited to cases where the interplay among variables causes them to have a different effect on the system than they'd have had individually if there was no interaction among them (El Sawy et al., 2010).

CT offers a complementary approach, with the view that instead of looking at elements individually, they can be viewed as combinations that collectively cause certain outcomes (El Sawy et al., 2010). Acknowledging the many contingencies in an organisation, CT suggests that organisations are best understood by examining elements simultaneously, with the intent of finding the best fit (configuration) among multiple variables in each context for the desired outcome. CT also allows for equifinality, the view that different variable combinations can result in the same outcome (El Sawy et al., 2010). An organisation's compliance is an outcome that is dependent on multiple factors cutting across people, internal policies and procedures and external factors. Hence, CT was deemed a fitting approach to conceptualise the variables that affect compliance among DFS agents.

To the best of the researcher's knowledge, compliance among DFS agents has not been explored much empirically. Without similar studies to adapt or adopt frameworks from, the challenge from the onset was to identify a framework that would afford the study two things. First, the ability to meaningfully characterize key aspects of agent businesses into organizational factors which can be operationalized into measurable constructs. While it has mostly been applied to study large organisations, CT was considered helpful to conceptualize agent businesses, treating them as fully-fledged organisations. Secondly, CT was chosen to guide the development of a conceptual model because it acknowledged the effect various elements in an organisation have on each other and the collective impact on outcomes (Venkatraman, 1989). For instance, an agent's finances affect their ability to honour customer's

requests, the location of their business which may be secure or not and the type of technology they can invest in to support their business. Training helps agents manage finances better, improve customer service, and utilize available technology better. Such back and forth influence across elements suggests that an agent's compliance is not a product of one element such as good strategy but rather a level of harmony among various elements. Ideally, an agent ought to find a configuration where structural, strategic and environmental elements lead to stability, profitability and compliance with DFS legislation. Once achieved, configurations (fit) are not static but keep changing to adapt to fast-changing environments (Miller, 1986). An agent would therefore need to keep evaluating their business elements and adapting such as keeping abreast with changing regulations to remain compliant.

There are six perspectives of fit that view and test the underlying variables in a case differently. The perspectives are "fit as (a) moderation, (b) mediation, (c) matching, (d) gestalts, (e) profile deviation, and (f) covariation" (Venkatraman, 1989, p. 424). Fit as covariation was the perspective chosen for this study. Fit as a covariation looks for logical links among independent variables. There are two levels of analysing effect in a fit as covariation perspective. The first is using first-order factors as in the left part of *Figure 2-2.* First-order factors specify direct effects between independent variables on an outcome. Second-order factor model as depicted on the right side of *Figure 2-2* provides insights on the patterns of internal effects (covariation) among independent variables which in turn has an effect on the outcome variable. These interactions among elements is coalignment, a theoretical construct that cannot be observed empirically (Venkatraman, 1989). Coalignment derives its meaning from observing the internal consistency of first-order factors which can be achieved analytically through confirmatory factor analysis and the strength of second-order factors can be calculated statistically and compared to that of the first-order model (Venkatraman, 1989).

The scope of this study was limited to examining direct (independent) effects of first-order factors structure, strategy and environment on the compliance outcome. Additionally, compliance was limited to agent self-reporting based on parameters derived from legislation literature. The schematic of Venkatraman's (1989) Fit-as-Covariation First Order effects was adopted to create the conceptual model for this study presented in *Figure 2-3*. CT's perspective on strategy, structure and environment was used to classify the various DFS agent characteristics under structure, strategy and environment constructs. Human and financial resources, business age and security components were placed under structure. Although technology and innovation are classified under environment in some CT studies, technology was considered a strategic tool for DFS agents as in this case it refers to specific devices and not innovation and was therefore classified under operational strategy together with training. The rationale of classifying training and technology as strategy is based on the observation and literature that indicates that training enables agents to offer better customer experience therefore giving them an edge. Similarly, agents with more advanced technlology such as security systems create a more secure environment for transacting and are likely to attract more customers (Atandi, 2013, Githae et.al, 2018). Therefore, training and technology are more strategic factors in agency banking. Environment comprised of the relevant legislation and standards that DFS agents are expected to adhere to and the prevailing socio-cultural factors such as trust relationships with customers.

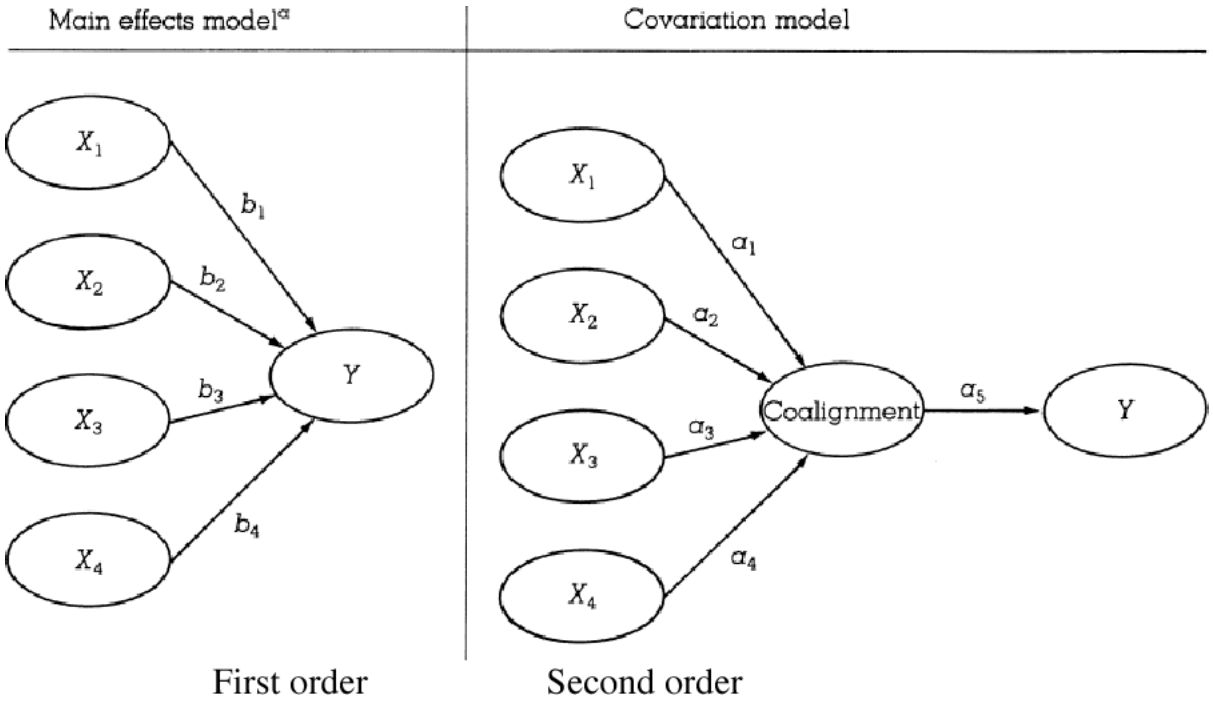

Figure 2-2: Fit-as-covariation (Venkatraman, 1989)

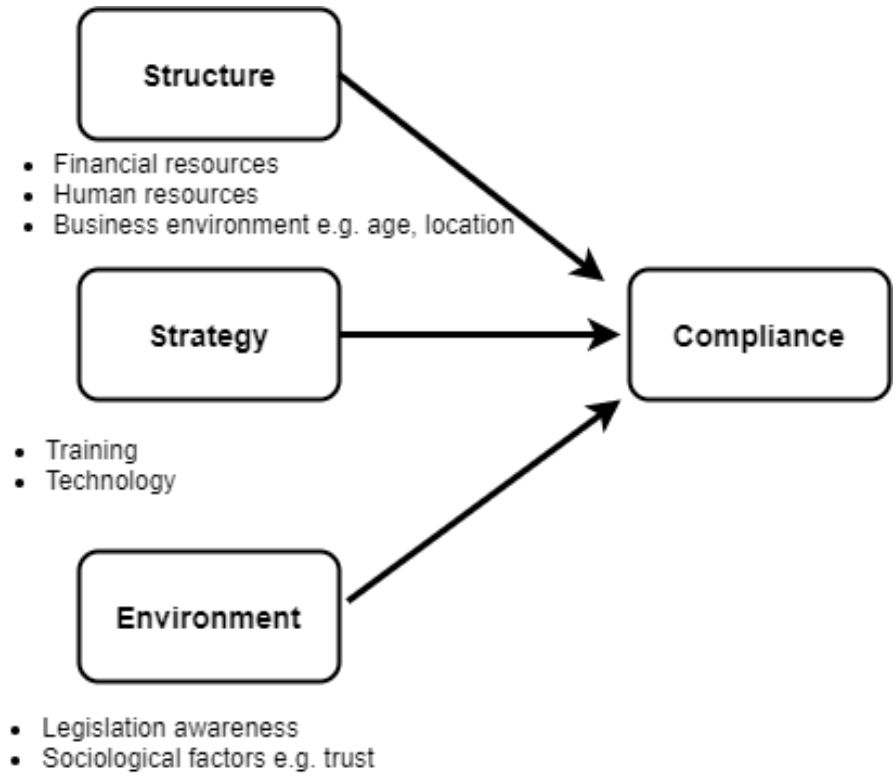

Figure 2-3: Conceptual Model

Table 2-4: Definition of study constructs

Structure	A description of the size of the business, its age and resource distribution (Miller, 1986). This study aims to find out how each agency business is constituted and resourced.
Strategy	These are the adaptive mechanisms a business employs to fit into the prevailing environment (Miller, 1986). Among DFS agents, the aspects that have the potential to set them apart from their competitors are their level of training which distinguishes their quality of customer service and having better technological infrastructure which improves their efficiency.
Environment	This is the context within which a business operates which is often characterised by the existence of competitors and governing rules and regulations (Miller, 1986). This study focused on socio-cultural and legislative aspects of the DFS environment.
Compliance	Compliance is how the regulated person behaves in relation to the rules they are expected to observe (Hopkins, 1994). The parameters to measure compliance in this study are derived from the legislations outlined in *Table 2-3*, particularly the clauses that place certain obligations on agents. They include KYC and CDD procedures, reporting suspicious activities, fraud and robberies, transaction fee disclosures, customer complaint escalation procedures and reference manuals.

2.5.3 Study Propositions

The following propositions are hypothesized:

P1: An agent's business structure influences compliance

The level of education, business age and capital outlay have an impact on agent business performance (Eijkman et al., 2010; Maurer et al., 2018). Aspects such as business location also have implications on the security of the agent and customer which is a concern for regulators (Ghosh, 2013). Collectively, these aspects of an agent business affect the compliance outcome of a DFS agent.

P2: An agent's operational strategy influences compliance

The importance of training for agents has been emphasized. Lack of training poses a risk to float mismanagement, poor customer handling, inability to perform KYC and CDD among other problems (Githae et al., 2018; Khattab et al., 2012; Njeru & Makau, 2014).

P3: An agent's awareness of the external environment influences compliance

The DFS environment here entailing legislation and socio-cultural influence from the community, an agent's awareness of what is required of them is important. Banks and MNOs are supposed to facilitate this awareness through training and awareness campaigns, but follow-up and on-going monitoring and support have been found to have gaps (Cull et al., 2018; Dermish et al., 2012; Karanja, 2018). An agent's exposure to and understanding of existing legislation will influence their compliance with them.

P4: Strategy has a greater influence on compliance than structure and environment.

DFS literature has pointed out that training helps agents manage liquidity, make better use of technology and run their business efficiently (Khattab et al., 2012; Njeru & Makau, 2014). Having certain technological devices improves an agent's security and ability to perform the required tasks better (Githae et al., 2018). Even though no strategy is superior according to CT (Venkatraman, 1989), the agents who are better trained and have better technology are also

likely to be more compliant and these aspects of the business are likely to contribute more to compliance than financial capacity and socio-cultural factors.

2.6 Summary

A scoping review was conducted highlighting the dominant agent-related themes in DFS literature. There is extensive literature to glean agent characteristics and challenges from, but little attention has been given intentionally to understanding DFS agents, their contexts, and challenges from their perspective. To contribute to this gap in literature, this study proposed examining compliance among agents which involves understanding how agent businesses are structured and resourced and how that affects their ability or inability to adhere to existing legislation and standard. Further, a conceptual model was developed to guide the empirical inquiry.

3 Research Design & Methodology

3.1 Introduction

This chapter outlines and discusses the research approach and methods used to meet the research objectives. It begins with a discussion of the philosophical stance that influenced the choice of methodology. Further, the research strategy, instrument development, data collection and analysis methods and tools used are discussed.

3.2 Philosophical Considerations

Both quantitative and qualitative research have underlying assumptions about the phenomenon under investigation, and the appropriate methods to conduct such an investigation (Myers & Avison, 2002). A researcher's awareness of the underlying assumptions is critical as it defines how the researcher views the object of inquiry within the confines of the underlying assumptions. Therefore, such assumptions influence the type of data, how it's collected, analysed and interpreted (Saunders, Lewis, & Thornhill, 2019).

3.2.1 Ontology

Ontology is a researcher's view of nature, that is the structure and properties of the object under investigation (Iivari, Hirschheim, & Klein, 1998). In IS research, ontology concerns data, people, information systems and their roles in the development and use of technology in society (Iivari et al., 1998). The ontological stance taken for this study is realism. It is also sometimes referred to as external realism for the fact that it views reality as being externally mediated rather than constructed within or among humans (Jonassen, 1991; Myers & Avison, 2002). Realism perceives reality as existing independently of the researcher's perception of it (Hirschheim, 1985; Myers & Avison, 2002). To a realist, data describes objective facts, information systems and organisations have relatively stable structures and humans are subject to deterministic laws (Iivari et al., 1998). A realist ontology proposes studying phenomena independent of the researcher and the use of observable, measurable facts (Saunders et al., 2019). The alternative ontology is that of relativism which considers reality as "a subjective construction of the mind" (Hirschheim, 1985, p.13). In relativism, objective reality only exists in the observer's mind and since it is shaped by the observer's experiences, language and culture among other things, reality therefore varies from one person and context to the other (Hirschheim, 1985). This study considered agency banking as an information system with hardware and software structures, agent businesses as stable empirical entities, and agents' behaviour to be subject to applicable legislation. All these aspects presented data that could be observed, characterized and measured by the researcher to determine compliance. Realism therefore was better aligned to this study's view of reality, the type of data required, and he means of obtaining it.

3.2.2 Epistemology

"Epistemology refers to the assumptions about knowledge and how it can be obtained." (Myers & Avison, 2002, p.5) This study adopted a positivist epistemology, which is consistent with a realist ontology (Hirschheim, 1985). Positivism seeks patterns and causal relationships in data to explain or predict reality (Iivari et al., 1998). Positivist studies involve using theories to derive and test propositions to understand phenomena better and make more accurate predictions (Orlikowski & Baroudi, 1991). Positivist inquiries are often carried out using quantitative methods and findings deemed objective and generalizable (Saunders et al., 2019).

There are alternative anti-positivist epistemologies such as interpretivism occupying the opposite end of the spectrum and critical theory that lies in between constructivism and positivism. Interpretivism holds that knowledge is socially constructed and negotiated by human actors and to obtain it, a researcher must understand the lived experiences and the social context of the individuals involved (Hirschheim, 1985; Scotland, 2012). Interpretive research

produces highly contextual knowledge that has limited transferability and is difficult to generalize (Scotland, 2012). Critical research challenges status quo with the aim of exposing deep-seated structural power and relationship inequalities (Hirschheim, 1985; Iivari et al., 1998). The aim of critical research is emancipation, exposing taken-for-granted assumptions and removing historical and ideological domination (Hirschheim, 1985; Iivari et al., 1998; Orlikowski & Baroudi, 1991).

The view held by the researcher for this study is that knowledge about agents pertaining to their business structure, strategy, environment and compliance status could be obtained in a structured way, quantified and analysed for predictive patterns and relationships that can be generalized to the population. Some of the criticism of a positivist approach is limitations on the researcher's ability to gain insights about complex realities by considering differences in contexts and experiences (Saunders et al., 2019). Being that this study's goal was to understand agent business elements and the general state of compliance and not delve into specific experiences of participants, positivism was still considered as the stance that afforded the best capabilities to conduct this study.

3.3 Research Purpose

The purpose of this study was exploratory. Exploratory studies are usually conducted on new areas to gain insights and improve the understanding of a phenomenon (Bhattacherjee, 2012; Saunders et al., 2019). There are many studies on DFS agents (Atandi, 2013; Githae et al., 2018; Karanja, 2018; Katela, 2017; Mungai, 2016; Njeru & Makau, 2014) but compliance among DFS agents has not received much empirical attention. The conceptual model developed that proposes studying agents as organizations rather than individuals is a novel approach. This study sought to obtain a holistic image of agents by considering agent businesses as organisations and examining them against their compliance requirements. These new constructs together with the measurement items developed or adapted from other studies (Karanja, 2018; Katela, 2017) provide further understanding of agents which future studies can explore to refine the operationalization of the constructs or to confirm the relationships proposed. Apart from compliance, the model can also be used to explore other agent performance outcomes.

3.4 Approach to Theory

A deductive approach was applied to this study. Also known as theory-testing, a deductive approach uses empirical data to test or confirm propositions (Bhattacherjee, 2012). Configuration theory was used to develop a conceptual model from which four propositions were derived for later testing with empirical data. Deductive studies mostly employ quantitative methods which is also aligned with a positivist epistemology (W. Chen & Hirschheim, 2004).

3.5 Research design

The design chosen for this study was a survey. Surveys are a typical quantitative method used for positivist-deductive research (W. Chen & Hirschheim, 2004). Surveys gather standardized data using questionnaires which makes them an economical means of collecting data from large populations (Orlikowski & Baroudi, 1991; Saunders et al., 2019). Survey approach is also suitable where there are time and resource constraints as it is not only fast to collect, but also numerical data can be coded and tabulated for analysis within a short time. Quantitative data obtained reliably through questionnaire can be analysed for generalisable patterns and comparisons between groups (Choy, 2014). The downside of a survey approach is that it does not capture in-depth insights, experiences and underlying perceptions of respondents that cannot be meaningfully expressed in numbers (Choy, 2014). This study sought data that would provide a broad overview of compliance among agents and allow grouping by compliance

levels without seeking case-specific insights. The survey approach was deemed fit for this undertaking.

3.6 Research Time Horizon

The time frame for this study was cross-sectional, examining and reporting the state of compliance among agents based on data collected at one point in time (Saunders et al., 2019). The researcher was bound by the timelines stipulated to carry out research for a Masters program. This limitation only afforded the opportunity to collect data in one instance.

3.7 Sampling

Sampling is the process of selecting a subset to be observed and analysed on behalf of a population of interest (Bhattacherjee, 2012). Selecting a representative sample is of utmost importance if the findings from the study are to be generalized to the population. Sampling bias could lead to erroneous and misleading generalized inferences (Bhattacherjee, 2012). Simple random sampling is a probability sampling technique that gives each unit within the sampling frame an equal chance of being selected (Bhattacherjee, 2012).

Most studies conducted previously on agents in Kenya have been limited to one location, Nairobi (Karanja, 2018; Katela, 2017), Narok (Githae et al., 2018), West Pokot (Atandi, 2013). There are significant variations in literacy, business and socio-cultural activities in different regions in Kenya. Single location studies may not satisfactorily represent the entire population of agents. However, because of time and financial constraints, it wasn't feasible within this study to collect data from the entire country. To improve the representativeness of the sample, respondents were drawn randomly from six regions (counties): Kisumu, Nairobi, Mombasa, Uasin Gishu, Nakuru and Meru. Compared to other sampling techniques, simple random sampling has the least sampling bias and inferences are more generalizable as a result (Bhattacherjee, 2012).

Approximately 63,400 agents are offering DFS on behalf of banks and microfinance institutions and 209,940 for MNOs in Kenya (Central Bank of Kenya, 2017; Communications Authority of Kenya, 2018). Since agents do not offer each DFS exclusively but are rather free to offer multiple DFS services for several MNOs and banks at the same time, the statistics are intertwined in reality. To make room for growth in the number of agents up to 2019, 300,000 was used as an estimate. Qualtrics sample size calculator was used to calculate the ideal sample size for this study ("Sample Size Calculator [Use in 60 seconds] | Qualtrics," 2020). The parameters used for the calculation were: Confidence Level 95%, Margin of Error 5% and population size 300,000. 500 questionnaires were administered to make room for incomplete and erroneous responses. Distribution across the six regions was allocated based on the approximate population of each county based on the most recent census report (Kenya National Bureau of Statistics, 2019). Random sampling was then applied within counties.

Table 3-1: Summary of sampling attributes and questionnaire distribution

Population	All agents offering DFS in Kenya	County population	Questionnaires
Unit of analysis	An agent who offers DFS in Kenya	Nairobi ≅ 4.3m	200
Sampling technique	Simple random sampling	Nakuru ≅ 2.6m	100
Confidence level	95%	Meru ≅ 1.5m	60
Margin of error	5%	Uasin Gishu ≅ 1.1m	50
Population size	300,000	Mombasa ≅ 1.2m	50
Sample size	384	Kisumu ≅ 0.72m	40

3.8 Data Collection

Questionnaires were the only data collection instrument used which are a well-established technique to collect demographic data and opinions especially over large samples (Myers, 2009). Hard copy questionnaires were administered in person by the researcher and four assistants and collected immediately after completion. This exercise was conducted over the course of six weeks. Three assistants were resident in the regions where they collected data and were trained virtually before the start of data collection. The main assistant and the researcher were based in Nairobi. They shared collecting data in Nairobi and then travelled to collect in one additional region each. The decision to use paper-based questionnaires was informed by two reasons. First, it would not be possible to obtain the agent contacts such as email addresses in advance which would facilitate the use of online forms. Secondly, agents operate mostly in the informal sector which is not characterized by technology savviness and therefore presenting a survey option which they are not used to would have posed additional challenges and possibly affected the response rate. Researchers who have surveyed agents in the recent past also used administered paper-based questionnaires face-to-face (Atandi, 2013; Karanja, 2018; Katela, 2017; Wachira, 2018).

3.8.1 Research Instrument

The study constructs were converted into questions and appropriate scales chosen for each item. The instrument had five sections, one for participants' demographic profiles and four for each construct in the conceptual model. Instruments from other recent studies conducted among agents in Kenya were consulted and relevant questions adopted or adapted to fit this study (Karanja, 2018; Katela, 2017). Being an exploratory study where no other compliance study had been carried out before, some items were developed from scratch. All 14 items for Environment and Compliance constructs were derived from legislation literature summarised in Table 2-3. For the structure and strategy constructs, 13 out of 22 questions were adapted from Karanja (2018) and Katela's (2017) studies which had surveyed agents before on financial status, and technology use and challenges. The 4 new items under strategy concerned training and were derived from the literature review specifically regarding follow-up and the sufficiency of available training (Akomea-Frimpong et al., 2019; Githae et al., 2018; Karanja, 2018; Wachira, 2018). The 5 new items under structure concerned agent and customer security while transacting (Akomea-Frimpong et al., 2019; Jack & Suri, 2011; Mungai, 2016; Njeru & Makau, 2014; Wachira, 2018), liquidity (Jack & Suri, 2011; Karanja, 2018; Malek et al., 2017; Maurer et al., 2018; Mungai, 2016; Njeru & Makau, 2014; Rea & Nelms, 2017; Wachira, 2018), sources of funds and the sufficiency of agent commission received (Rea & Nelms, 2017).

The questionnaire comprised mainly of close-ended questions. Quantitative close-ended questions involve assigning numerical values to properties of the phenomenon being studied to facilitate statistical analysis (Zikmund, Babin, Carr, & Griffin, 2012). The questionnaire used nominal and ordinal scales. Nominal scaling was applied as binary and categorical scales where respondents were required to select their responses from two alternatives like 'yes' or 'no', or from lists with several alternatives such as various education levels and income ranges (Bhattacherjee, 2012). Ordinal scaling was applied as Likert scales with simply worded statements to which respondents indicated whether they agreed or disagreed with. Likert scales are typically used to capture respondent opinions and attitudes (Zikmund et al., 2012). 5-point Likert scales were used which provided a midpoint, thus allowing respondents to show neutrality to the statements presented (Bhattacherjee, 2012).

The instrument was structured into five sections, one for demographic data and one for each of the four constructs of the conceptual model for this study. Section 1 captured the age and gender of respondents. Section 2 sought information about the agent's level of education, work

experience, agency business experience, financial resources and physical security aspects. Section 3 obtained data on the types of technologies agents used, technological challenges and their training status and opinion. Section 4 obtained data about agents' awareness of existing legislation and trust between agents and their customers. Lastly, section 5 examined agents' status with respect to each legislation requirement. Further details of each section are summarised in and the questionnaire is attached as **Appendix H**.

Table 3-2: Summary of questionnaire items, scales and sources

Section	Construct	Type of scale	Total items	New items	Sources
1	Demographics	Nominal	2		(Katela, 2017)
2	Structure	Nominal, Ordinal	14	5	(Karanja, 2018; Katela, 2017)
3	Strategy	Nominal, Ordinal	8	4	(Karanja, 2018; Katela, 2017)
4	Environment	Ordinal	7	7	
5	Compliance	Ordinal	7	7	

3.8.2 Participant error and bias mitigation

Participant errors and biases that are a threat to instrument reliability and validity can arise due to circumstances surrounding data collection. Participant response bias arises when participants respond according to what they think the researcher expects of them, offering the socially desirable response instead of their honest response (Bhattacherjee, 2012). Participant errors can be caused by the prevailing environment such as the mood of the respondent at the time of data collection (Bhattacherjee, 2012). To mitigate such errors and biases, several measures were taken. First, the researcher and assistants introduced the study to each participant and presented the ethical clearance from the university and the licence to collect data in Kenya. Further, they explained that the questionnaire was anonymous, and that participation was entirely voluntary. Anonymity is one way to ensure respondents answer truthfully due to the assurance that their responses are not traceable to them (Saunders et al., 2019). This was meant to mitigate against participant bias.

To address participant errors, issuing of questionnaires was only done early in the day between 8-10 am. The rationale was that there is usually less customer traffic to the shops early in the morning. Therefore, collecting data within that window was deemed to potentially reduce the number of declines to participate, incomplete questionnaires or errors due to participants responding in a hurry.

3.9 Data Analysis

3.9.1 Tools

Microsoft Excel, IBM SPSS and SmartPLS were used at various stages of data analysis. Microsoft Excel was used for data capturing from the manual questionnaires and checking for errors. IBM SPSS was used for normality, validity and reliability testing, generating descriptive statistics and cluster analysis. SmartPLS was used to measure the suitability of the structural model and to test the propositions.

3.9.2 Normality Testing

Normality tests are done to determine the appropriate tests to further analyse and interpret the data. Ideally, most of the scores in a dataset would be at the centre of the distribution (Field, 2009). For example, in a survey about height or intelligence quotient (IQ), most people would have average scores and fewer with above or below average scores (Frost, n.d.). When plotted on a graph, the curve would be bell-shaped and when a vertical line is drawn at the centre of

the distribution, both sides of the curve should look the same (Field, 2009). Therefore, normal distributions are symmetrical. Normality tests check whether most of the responses in a dataset cluster around the average score and the frequency of scores decreases the further you go from the centre (Field, 2009). To generate trustworthy results, it is important to know whether the data is normally distributed or not as some statistical tests such as analysis of variance and regression assume that the data is normally distributed (Frost, n.d.).

The main method used to check the data for normality in this study was checking the statistical values of mean, median, mode, skewness and kurtosis (Field, 2009). In a perfect symmetric distribution, the values of mean, median and mode should be the same (Ekström & Jammalamadaka, 2012). However, in real life, data rarely fits a normal distribution perfectly (J. Chen & Scott, 2020). Skewness and Kurtosis coefficients are used to show how much the data deviates from a normal distribution. Skewness values (γ_1) represent a lack of symmetry in the observed data. A value of $\gamma_1 = 0$ represents a symmetric distribution (Blanca, Arnau, López-Montiel, Bono, & Bendayan, 2013). Positive values of skewness indicate that the curve is skewed to the right meaning that most scores/responses are on the higher side of the scale and very few on the lower side. Conversely, negative values indicate that the tail is skewed to the left meaning there are more scores on the lower side of the scale. Kurtosis (γ_2) measures the peak and flatness of a distribution. Similar to skewness, $\gamma_2 = 0$ represents the expected peak and flatness of a normal distribution (Blanca et al., 2013). Positive kurtosis values indicate that the distribution has a higher peak than normal meaning that nearly all scores are average and the expected below and above average outliers are not represented. Negative values indicate the distributional is flatter than normal meaning that there are not enough average scores to make a clear majority. The further the kurtosis and skewness values are from zero (0), the less likely it is for the data to be normally distributed (Field, 2009). Absolute values of the skewness and kurtosis coefficients less than 1.0 have been categorized as slight non-normality, 1.0 to 2.3 as moderate non-normality while values beyond 2.3 indicate severe non-normality (Lei & Lomax, 2005).

3.9.3 Validity and Reliability Testing

Validity tests are performed to test the extent to which an instrument measured what it claimed to be measuring (Field, 2009). A questionnaire is usually made up of items (questions). The items are categorised into constructs based on proposed theoretical traits. Construct validity, therefore, is a measure of how well the operationalization was done such that the questionnaire items measured the construct it purports to measure (Field, 2009). One measure of validity is collinearity, which is the measure of the relationship between indicators. Collinearity values were obtained from partial least squares structural equation modelling (PLS-SEM).

Collinearity differs depending on the nature of the relationship between the observed indicators and the latent variable. In a reflective model, causality is from the construct to the observed indicators (Diamantopoulos, Riefler, & Roth, 2008). Reflective indicators are expected to be strongly correlated because they share a common cause but indicators in formative models do not have the same expectations and can be positively, negatively correlated or uncorrelated. In formative models, observed indicators cause variance in the construct but the reverse does not necessarily apply (Cenfetelli & Bassellier, 2009). For instance, in this study, human resources, finances and physical security are indicators of the latent construct structure. Although these indicators don't exclusively constitute business structure but are an overall representation of it, it is illogical that a latent construct called structure exists solely by itself. "Specifically, with formative measurement, the phenomenon of interest does not occur naturally but it is instead "formed" by the presence of underlying measures" (Sarstedt, Ringle, Smith, Reams, & Hair, 2014, p.3). All the constructs in these studies were formatively measured.

PLS-SEM has been recommended as the more suitable method to analyse constructs measured using formative indicators (Hair, Hult, Ringle, & Sarstedt, 2016). PLS-SEM's predictive modelling has been identified as one of its major strengths. As opposed to other SEM methods such as covariance-based SEM (CB-SEM) that are designed for explaining and confirming relationships, PLS-SEM is best suited for identifying relationships for prediction and theory development (Sarstedt, Ringle, Henseler, & Hair, 2014). Numerous IS studies have used PLS-SEM to analyse formative constructs such as perceived usefulness of institutional structures (Pavlou & Gefen, 2005); observational learning (Yi & Davis, 2003); perceived user resources (Mathieson, Peacock, & Chin, 2001); and IS use-related activity (Barki, Titah, & Boffo, 2007).

Smart-PLS 3, a prominent PLS-SEM software was used. Smart-PLS is popular for its intuitive graphical user interface (Wong, 2013). The original dataset in Excel format was edited to remove all string values, converted to .csv file and uploaded to Smart-PLS. Variance Inflation Factors (VIF) values were then obtained. Variance inflation factors (VIF) values of greater than 5 suggest potential collinearity problems but values of 3 and lower are ideal (Hair et al., 2019; Ringle & Sarstedt, 2016). An inter-item correlation matrix was generated from IBM SPSS to collaborate the VIF values.

3.9.4 Model Quality and Proposition Testing

To evaluate the model and test the study propositions, partial least squares structural equation modelling (PLS-SEM) was used for two reasons. First, PLS-SEM is recommended for exploratory research where there is rich data, but the theory is only skeletal (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). "...the model extracts fresh knowledge from the data, thereby putting flesh on the theoretical bones." (Lohmöller & Wold, 1980, p.1) Secondly, all the observed constructs in this study were formative. A construct is considered formative if changes in the observed indicators result in a change in the construct whereas, in a reflective construct, changes in the construct result in changes in the observed indicators (Hair et al., 2014). The three stages of PLS-SEM were followed which involve: specifying the model then evaluating the outer and inner model. The initial model in *Figure 3-1* was created including all the 25 indicators measured on Likert scales. For formative indicators, arrows point from the observed indicators to the latent variable (Wong, 2013).

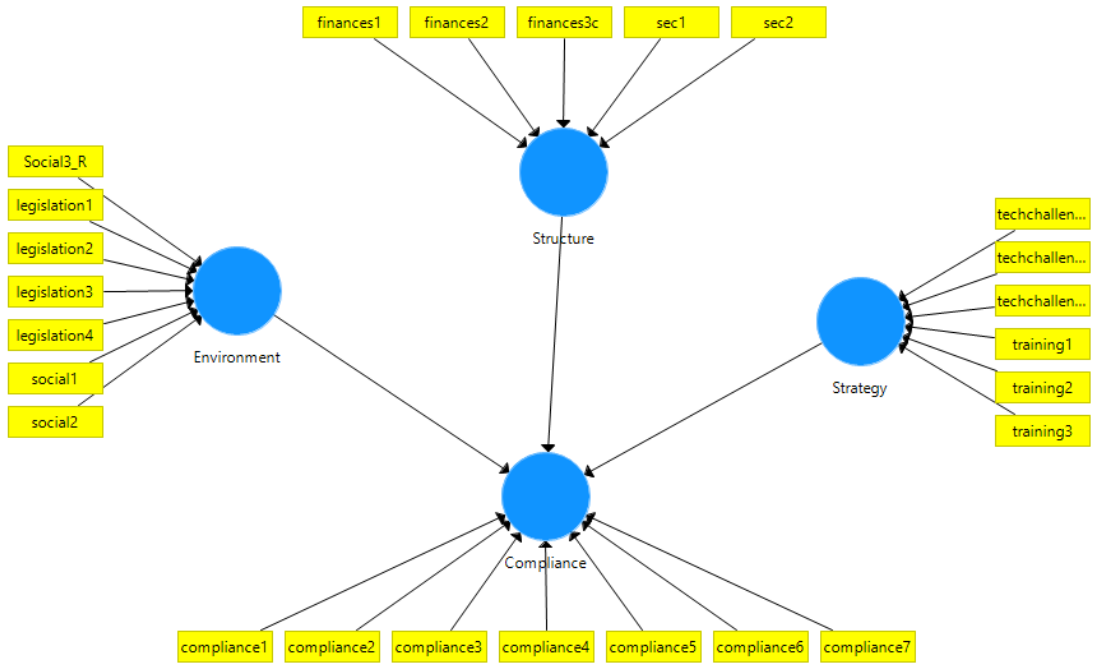

Figure 3-1: Initial model generated on SmartPLS

PLS-SEM simultaneously examines the quality of the model used to measure the latent variable as well as testing the correlations among constructs (Hair et al., 2014). The inner model, also known as the structural model, presents the dependent and independent variables and their relationships whereas the outer model, also known as the measurement model, presents the latent variables and their observed indicators (Wong, 2013). PLS model building is described as "…an evolutionary process, a dialogue between the investigator and the computer" (Lohmöller & Wold, 1980, p.1), in which improvements are made to the model by introducing or omitting indicators to improve its predictive power (Hair, Risher, Sarstedt, & Ringle, 2019).

There are several criteria for interpreting formative construct results which include checking for multicollinearity, non-significant weights, and negative weights (Cenfetelli & Bassellier, 2009). For formative constructs, outer weights are used instead of outer loadings to assess the strength of observed indicators in relation to the latent construct (Mathieson et al., 2001). The t-statistic and p-values are used to determine statistical significance and are obtained through the bootstrapping technique (Ringle, Da Silva, & Bido, 2014). T-static greater than 1.96 and p-value of less than 0.05 (at 95% confidence level) are considered significant respectively. Whether the indicator is reflective or formative, the outer weights are supposed to be positive (Ringle & Sarstedt, 2016). It is not necessary to report discriminant and convergent validity and internal reliability for formatively measured constructs as such values have more meaning for correlated indicators which is not a requirement for formative indicators (Wong, 2013). SmartPLS does not generate Cronbach Alpha and AVE coefficients for formative indicators but only generates the rho_A coefficient of composite reliability for each construct. Rho_A value of at least 0.70 is expected (Ringle et al., 2014).

For model quality, the assessment criteria include the R^2 and statistical significance of the path coefficients (Hair et al., 2019). R^2 measures the predictive power of the in-sample model and the values range from 0 to 1. The closer the value is to 1, the higher the predictive power. R^2 threshold is context-specific and some disciplines consider as low as 0.10 satisfactory but in general, 0.25, 0.50 and 0.75 are considered weak, moderate and substantial respectively (Hair et al., 2019). R^2 however, only indicates the explanatory power of the model within the sample but does not estimate the predictive power of the model out-of-sample (Hair et al., 2019).

There are further analyses that provide out-of-sample insights. The blindfolding technique generates the Q^2 coefficient which combines aspects of in-sample and out-of-sample explanatory power and generates predictive accuracy values based on a test set, rather than the training set. Higher values of Q^2 indicate a good model with 0, 0.25 and 0.50 depicting small, medium and substantial predictive power (Hair et al., 2019). PLSpredict splits data randomly into equal-sized subgroups, performs cross-validation and generates several statistics quantifying the out-of-sample prediction error. The two most commonly used errors are mean absolute error (MAE) and the root mean squared error (RMSE). RMSE is recommended for most instances (Hair et al., 2019). RMSE values are compared against a naïve benchmark, typically linear regression model (LM) predictions automatically generated by PLSpredict. PLSpredict does not examine errors in all the constructs but rather focuses on the model's key endogenous construct. If the model has higher RMSE values (prediction errors) compared to the LM naïve benchmark, the model has no predictive power. If the majority, minority (or equal) or none of the indicators have higher RMSE compared to the naïve LM benchmark, then the model has low, medium or high out-of-sample predictive power (Hair et al., 2019).

3.9.5 Cluster analysis

Cluster analysis is a useful exploratory tool to discover patterns in a dataset and classifying similar elements into mutually exclusive categories (Balijepally, Mangalaraj, & Iyengar, 2011; Norusis, 2012). The objective of conducting cluster analysis was to derive coherent subgroups

(clusters) among agents in this study that might provide further insights on their structure, strategy, and environment characteristics and compliance behaviour.

Additionally, the cluster analysis test was applied as a way of validating the results obtained from PLS-SEM using the configuration conceptual model developed. The conceptual model covered first-order effects, measured the effect of structure, strategy and environment on compliance. A second-order model would've measured some underlying commonality among structure, strategy and environment that can then be considered a second-order construct affecting compliance. Identifying such commonalities was not within the objectives of this study although an indirect benefit that could have been derived from doing so would have been further validation of the measurement model. Cluster analysis served this purpose. The independent variables structure, strategy and environment were expected to show coherently similar behaviour on the effect on compliance on both tests. if the model was good, the effect of strategy, structure and environment should be reflected in the clusters and if not, then the model was questionable.

Two-step clustering was selected over hierarchical and *k*-means clustering for its ability to handle a mixture of scales in a dataset (Norusis, 2012; Okazaki, 2006). That allowed for the use of raw scores rather than standardized ones for both categorical and continuous questionnaire items. Only questionnaire items that had previously been tested for normality and multicollinearity were used. The two measures are recommended if any inferences are to be made from the sample to the population (Okazaki, 2006).

Good clustering should be characterized by homogeneity within the cluster and heterogeneity between or among other clusters. The silhouette coefficient is used to measure this quality by determining the average distance between one element to the other elements in the same cluster as well as the average distance from the element to elements from other clusters (Norusis, 2012). The distances within the cluster and between/among clusters are expected to be small and large respectively in a good clustering solution. The measure ranges from -1 to +1 and the closer the value is to +1, the better the clustering solution (Norusis, 2012).

3.10 Threats to Internal and External Validity

Internal validity refers to the level of confidence that the relationship proposed between variables could not have been caused by other factors not measured or accounted for by the study (Bhandari, 2020). Some common threats to internal validity include selection bias, instrumentation and testing (Bhandari, 2020). Selection bias was mitigated by applying probability sampling where respondents were picked randomly. With regards to instrumentation and testing, there was no pilot study, only one data collection instrument was used and therefore no agent had prior exposure to the instrument which could have influenced their responses. Thirdly, the questionnaires were administered and filled in the presence of the researcher or an assistant, which limited any social interaction with other agents to compare responses.

External validity refers to the extent to which a study's findings can be generalised to a broader context (Bhandari, 2020). The main threat to external validity for this study was participant inclusion criteria. This was mitigated first by broadening the geographical coverage of the study to 6 counties and thereafter applying random sampling to ensure as much variability of responses as possible.

3.11 Research design and methodology summary

Table 3-1: Summary of research philosophy and methodology

Ontology	Realism
Epistemology	Positivism
Approach to theory	Deductive
Purpose	Exploratory
Strategy	Survey
Timeframe	Cross-sectional
Research instrument	Quantitative questionnaires
Sampling	Simple random
Population & sample	DFS agents in Kenya
Data collection	Paper-based questionnaires
Data analysis tools	Excel, IBM-SPSS, SmartPLS
Statistical tests	Normality, reliability and validity, PLS-SEM, two-step cluster analysis

4 Data Analysis and Results

4.1 Introduction

This chapter presents the results of the data analysis exercise. Empirical data was collected according to the approach and guidelines described in Research Design & Methodology chapter. First, demographic statistics of study participants are presented followed by results from the tests conducted to determine whether the data was normally distributed. The study constructs are then described using frequency tables and graphs. Next, the results of a principal component factor analysis that was conducted to test the validity of the questionnaire are presented and discussed, followed by Cronbach's coefficient of alpha that measured construct reliability. Questionnaire items that didn't meet the required validity and reliability threshold were excluded from further analyses. The remaining questionnaire items were used to perform Partial Least Squares Structural Equation Modelling (PLS-SEM) to test the quality of the model used for the study and the propositions made in relation to the research questions. Finally, a two-step cluster analysis is used to group agents according to compliance behaviour and thereafter a summary of the chapter is presented.

4.2 Data cleaning and preparation

500 paper-based questionnaires were administered to bank and MNO agents. The response rate was 90% with 450 returned. A template was created on IBM SPSS where all the questionnaire items were defined. The type of scale used to measure each variable was also defined, and each response on the scale was assigned a numerical value. Data were then entered from the hardcopy questionnaire into the template. To check for data entry anomalies, frequency tables were generated for each variable. Several data entry errors were identified and corrected.

4.3 Demographic Statistics

Table X provides demographic statistics of respondents covering age and gender attributes.

Table 4-1: Respondents' Age and Gender

Attribute	Category	Frequency	Percent
Gender	Male	203	45.1
	Female	233	51.8
	Prefer not to answer	13	2.9
Age	18-30 years	240	53.3
	31-40 years	126	28.0
	41-50 years	41	9.1
	Above 50 years	23	5.1

From the frequencies and percentages of *Table 4-2* above, it is observed that out of the 450 respondents surveyed, majority of them were female, accounting for 51.8% (n = 233) and 41.5% (n = 203) were male and 2.9% (n = 13) preferred not to disclose their gender. These findings are contrary to those of Atandi's (2013) study that had 70% male respondents and 30% female respondents respectively. The slight skew on the number of female agents identified in this study better relates to Katela's (2017) and Karanja's (2018) studies which had 57:43 and 50.6:49.6 percent respectively, skewed towards females in both cases. A study conducted by IFC and Mastercard revealed that women are more successful as DFS agents and reported more average monthly transactions, transaction value and net profit than men (International Finance Corporation, 2018). Two possible explanations were given. The first was that female agents

are more likely than men to be offering services such as hairdressing and tailoring. Agents whose core business is services rather than goods tend to have higher revenues on average (International Finance Corporation, 2018). Secondly, female agents had a higher likelihood than males to be present even in disadvantaged, lower income areas while male agents tended to cluster in municipalities with better commercial development (International Finance Corporation, 2018).

On the age attribute, the 18-30 category had the highest number of respondents accounting for 53.3% (n = 240) while the second highest was the 31-40 category representing 28.0% (n = 126). 41-50 and Above 50 categories accounted for 9.1% (n = 41) and 5.1% (n = 23) respectively. This agrees with Katela's (2017) study in which 56% of the respondents were aged between 19-29 and the second largest group was 30-40 years at 31%.

4.4 Normality tests

To obtain mean, median, mode, skewness and kurtosis values, frequency tables were generated. Histograms with a normal curve plotted for each variable were also generated for a visual presentation of the data and are presented in **Appendix B**.

Table 4-2: Structure construct statistics

	Human Resources			Business Environment						Financial Resources				
	job status	Edu	First_job	pri_bus	bus_age	agency_age	mult_agency	Agent sec	Cust sec	Float_range	Comm_range	liq	Source	Comm
Valid N	438	447	446	450	237	445	449	443	443	440	440	445	445	444
Mean	1.51	3.32	1.47	1.48	2.34	1.93	1.59	2.29	2.41	3.29	2.47	2.73	2.85	3.21
Median	2.00	3.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	3.00	2.00	3.00	3.00	3.00
Mode	2.00	2.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	3.00	2.00	2.00	2.00	3.00
Std. Dev	0.50	1.26	0.50	0.50	0.85	0.71	0.49	0.98	1.11	1.17	1.04	0.97	1.01	0.90
Skewness	-0.05	0.11	0.12	0.10	0.52	0.55	-0.39	0.47	0.38	-0.02	0.58	0.37	0.14	-0.10
Kurtosis	-2.01	-1.11	-2.00	-2.00	0.29	0.84	-1.86	-0.52	-0.88	-0.96	-0.22	-0.59	-0.98	-0.60

Questionnaire item	Abbreviation for tables
Job status	Job status
Education	Edu
First Job	firstjob
Primary Business	pri_bus
Business age	bus_age
Agency age	agency_age
Multiple agency	mult_agency
Agent security	Agent sec
Customer security	Cust sec
Float range	Float
Commission range	Commission
Liquidity	Liq
Source of funds	Source
Commission	Comm

Observations were made on the data per construct. On the mean, median and mode similarity criteria, out of the 14 questionnaire items used to measure Structure, 8 questionnaire items met the requirement while 6 questionnaire items had slight variations with at least two of the measure being similar in each case. The skewness values were between 0.02 and 0.58, placing all the 14 questionnaire items in the slight non-normality category. 5 out of 14 questionnaire items fell under moderate non-normality under kurtosis values while the rest 9 were in the slight non-normality category. All the 5 questionnaire items with moderately non-normal kurtosis had negative values indicating that there was no clear majority on the job status,

education, first job, primary business and multiple agency questionnaire items. Four of these questionnaire items were measured on binary (yes/no) scales and therefore did not have many data points. The fifth, level of education, is a demonstration of a flatter than normal curve. The responses were distributed with none of the education levels taking a an outstanding majority: secondary school (n = 137), certificate (n = 85), diploma (n = 109) and degree (n = 89).

Table 4-3: Strategy construct statistics

	Technology				Training			
	Tech use	Phone problems	Network problems	POS problems	Initial training	Counterfeit ID	Refresher training	Sufficiency of training
Valid N	445	444	443	124	360	444	441	441
Mean	1.95	3.58	3.73	3.27	1.13	4.06	3.85	3.63
Median	2.00	4.00	4.00	3.00	1.00	4.00	4.00	4.00
Mode	1.00	4.00	4.00	3.00	1.00	4.00	4.00	4.00
Std. Dev	1.10	0.73	0.64	0.97	0.34	0.93	0.95	1.04
Skewness	1.02	-0.14	-0.19	0.14	2.17	-1.12	-0.68	-0.33
Kurtosis	0.19	0.35	0.03	-0.57	2.71	0.79	-0.22	-0.75

Questionnaire item	Abbreviation for tables
Technology use	Tech use
Phone problems	Phone problems
Network problems	Network problems
POS problems	POS problems
Initial training	Initial training
Counterfeit recognition	Counterfeit recognition
Refresher training	Refresher training
Sufficiency of training	Sufficiency of training

For the Strategy construct, 3 out of 8 questionnaire items met the mean=median=mode criteria while the remaining 5 varied only slightly from each other (0.1 to 0.5 difference), with at least two of the measures having similar values in each case. 5 out of 8 and 7 out of 8 questionnaire items had only slight non-normality by skewness and kurtosis values respectively. 3 had moderate non-normality by skewness values and 1 (Initial training) had severe non-normality by kurtosis values. The variable with severe non-normality by kurtosis was also measured on a binary scale. Most of the agents were trained (n = 312) compared to those who weren't (n = 90) and therefore the sharp curve and a higher than normal peak.

Table 4-4: Environment construct statistics

	Legislation				Social Factors		
	KYC	AML	STR	Privacy	Trust	C_loyalty	A_loyalty
Valid N	443	442	441	443	446	448	446
Mean	3.57	3.55	3.57	3.95	3.69	4.21	2.78
Median	4.00	4.00	4.00	4.00	4.00	4.00	3.00
Mode	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Std. Dev	0.88	0.90	0.90	0.92	0.79	0.84	1.18
Skewness	-0.97	-0.66	-0.54	-0.95	-0.83	-1.29	-0.08
Kurtosis	0.64	-0.01	-0.28	0.72	0.98	2.14	-1.11

Questionnaire item	Abbreviation for tables
Know your customer	KYC
Anti-money laundering	AML
Suspicious transaction reporting	STR
Customer privacy	Privac.
Agent-customer trust	Trust
Customer loyalty to agent	C_loyalty
Agent loyalty to customer	A_loyalty

1 out of 7 questionnaire items under Environment satisfied the mean=median=mode criteria while 5 varied slightly (0.1 to 0.4 difference), and 1 had different values for each measure. 6 out of 7 questionnaire items were slightly non-normal under skewness and 1 moderately non-normal. 5 out of 7 questionnaire items were slightly non-normal while 2 were moderately non-normal.

Table 4-5: Compliance construct statistics

Compliance

	ID	Liquidity	Fees	Hotlines	Complaints	Reporting	Manuals
Valid N	446	446	446	447	447	445	447
Mean	4.15	3.76	4.21	4.04	4.02	4.09	3.73
Median	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Mode	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Std. Dev	0.81	0.89	0.66	0.82	0.80	0.74	1.09
Skewness	-1.38	-0.54	-0.78	-1.19	-0.57	-0.91	-0.57
Kurtosis	2.94	-0.08	1.83	2.05	-0.02	1.66	-0.65

Questionnaire item	Abbreviation for tables
Customer ID	ID
Liquidity	Liquidity
Transaction fees	Fees
Customer hotlines	Hotlines
Complaint handling	Complaints
Incident reporting	Reporting
Manuals	Manuals

5 out of 7 questionnaire items under Compliance met the mean=median=mode criteria while 2 varied slightly (0.3 difference) and at least 2 of the measures being similar in each case. By Skewness values, 5 questionnaire items were slightly non-normal and 2 were moderately non-normal. 3 questionnaire items were slightly non-normal, 3 were moderately non-normal while 1 was severely non-normal by kurtosis values. *ID* measured agents' evaluation of customer identification documents. A higher than a normal peak on that variable denotes very high compliance with that requirement with 56.3% (n = 251) agreeing and 32.7% (n = 146) strongly agreeing that they always verify customer ID.

Collectively, 19 out of 36 questionnaire items met the mean=median=mode normality criteria. 21 had similar values in 2 out of the three measures and the third measure varied by 0.1 to 0.5 from the other two. Only 1 variable out of 36 (social3) had a different value for mean, median and mode. By skewness 31 questionnaire items were in the slightly non-normal range and 6 were moderately non-normal. By kurtosis, 26 questionnaire items were slightly non-normal, 9 were moderately non-normal and 2 severely non-normal. None out of 36 questionnaire items violated both skewness and kurtosis acceptable non-normality threshold.

The conclusion from the statistical and visual tests for normality indicated that most of the questionnaire items were normally distributed or slightly non-normal. Collectively, the data

did not grossly violate the normality threshold and therefore parametric tests could be applied where necessary.

4.5 Study Constructs

This section describes each of the study constructs according to the items and scales that were used to measure them. The objective is to derive insights from observing frequencies.

4.5.1 Structure

This construct was concerned with the various resources and other structural characteristics. It was measured with questions exploring the human resources employed, how long the agent has been in operation, their running capital and commissions earned monthly. The results are presented below.

i. Human resources

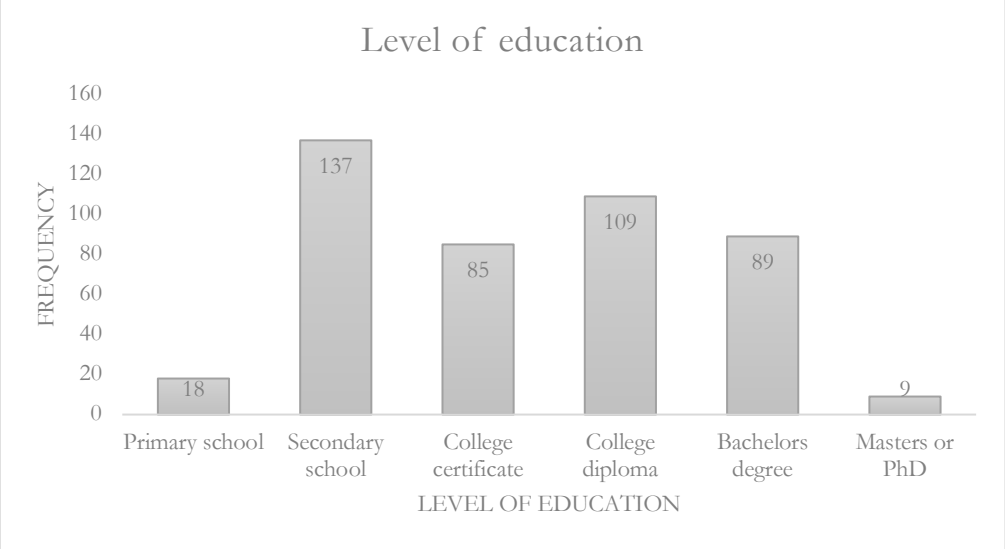

Figure 4-1: Agent Education Status

Respondents with a secondary school qualification accounted for 30.4% (n = 137) while college diploma holders accounted for 24.2% (n = 109). Bachelor's degree holders and college certificate holders accounted for 19.8% (n = 89) and 18.9% (n = 85) respectively. 4% (n = 18) had a primary school qualification while only 2% (n = 9) had a master's or a PhD. College certificates are short courses typically taken within one year while diplomas vary from 2 to 3 years (MANCOSA, 2019).

Table 4-6: Respondents' Job Status

Attribute	Category	Frequency	Percent
Job Status	Business owner	214	47.6
	Employee	224	49.8
First job	Yes	236	52.4
	No	210	46.7

49.8% (n = 224) of respondents were employees while 47.6 % (n = 214) owned the agency business. For 52.4% (n = 236), being an agent was their first job while 46.7% (n = 210) had held other jobs before. Agency banking provides entrepreneurial opportunities to new and

existing entrepreneurs and employment opportunities to young unskilled people (Peša, 2018). There are disparities in the livelihoods of employees and owners. Peša (2018) observed that in Zambia, agent employees worked longer hours, were poorly paid and rarely had formal employment contracts.

ii. Business experience

There were more agents who had primary businesses apart from the agency services (n = 236) than those who solely offered agency services (n = 214). Most of the primary businesses had 2-4 years' experience. 2-4 years was also the most common response to how long agents had been offering DFS services in their current premise. Majority of agents (n = 267) offered only one DFS service while the rest (n = 182) offered more than one DFS services. Banks or MNOs are no longer allowed to have exclusive agents (Dermish et al., 2012). Therefore, these numbers might indicate a voluntary preference by agents to only offer one bank's or MNO's services.

Table 4-7: Primary business and agency exclusivity

	Primary Business			Multiple Agency	
	Frequency	Valid Percent		Frequency	Valid Percent
Yes	236	52.4	Yes	182	40.5
No	214	47.6	No	267	59.5

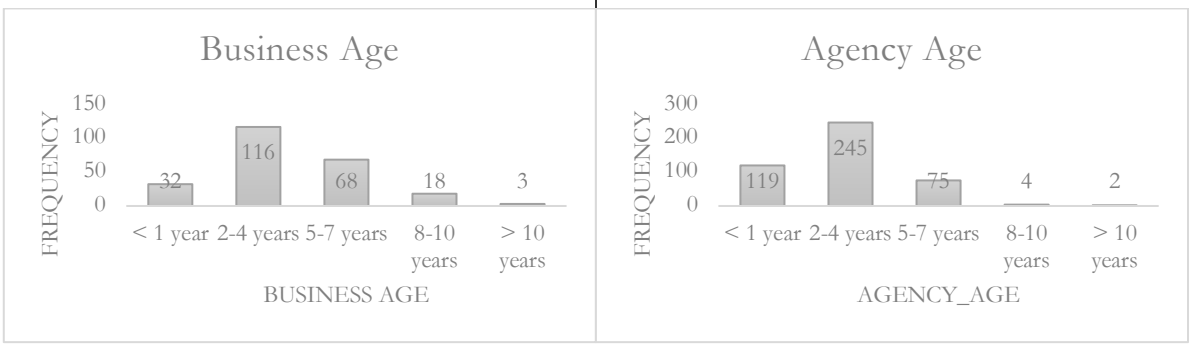

Figure 4-2: Primary business age & Agency age

iii. Finance

Agents operated on a float of 10,000-100,000 with a slight majority on 20,000-50,000. Most of them earned a commission of 10,000 to 20,000 per month. 48.3% (n = 215) indicated no struggle with liquidity. While 44% (n = 196) did not need funds from elsewhere to supplement agency float, the number of those who indicated dependency on funds from other sources is still notably high at 32.1 % (n =143).

Table 4-8: Agent float and commission

	Float		Commission	
Amount (KSH.)	Frequency	Valid Percent	Frequency	Valid Percent
< 10,000	22	5.0	70	15.9
10,000-20,000	101	23.0	189	43.0
20,000-50,000	131	29.8	105	23.9
50,000-100,000	100	22.7	57	13.0
>100,000	86	19.5	19	4.3

Table 4-9: Financial status

	Struggles with liquidity		Uses funds from other sources		Commission paid is enough	
	Frequency	Valid Percent	Frequency	Valid Percent	Frequency	Valid Percent
Strongly disagree	28	6.3	26	5.8	7	1.6
Disagree	187	42.0	170	38.2	96	21.6
Neutral	123	27.6	106	23.8	163	36.7
Agree	92	20.7	129	29.0	154	34.7
Strongly agree	15	3.4	14	3.1	24	5.4

iv. Security

Security was measured on a Likert scale, probing whether agents had any insecurity concerns about where their business was located and whether their customers felt unsafe transacting at their business premise. The majority indicated that insecurity for them and their customers was not a concern. However, besides those who were neutral on the issue, those who acknowledged security concerns for them and their customers accounted for 14% and 21% respectively which are notably significant.

Table 4-10: Agent and customer physical security

	Agent security		Customer security	
	Frequency	Valid Percent	Frequency	Valid Percent
Strongly disagree	96	21.7	103	23.3
Disagree	189	42.7	159	35.9
Neutral	95	21.4	86	19.4
Agree	59	13.3	85	19.2
Strongly agree	4	0.9	10	2.3

4.5.2 Strategy

Strategy explored the type and level of technology utilisation and their training status and opinion.

i. Technology

A categorical scale was used which allowed agents to select the different technologies they used from a list. Most agents utilized only one type of technology. The five technologies evaluated were mobile phone, POS device, CCTV cameras, cash counting machines and UV lights to check counterfeit notes. The most common were phone only or phone and POS which are required to carry out transactions. The additional technologies and tools are enhancements to improve efficiency and security and mitigate fraud. A Likert scale was used to assess the frequency of technological challenges. There didn't appear to be major technological challenges, with the only notable one being POS problems which was reported to happen often by 25 agents.

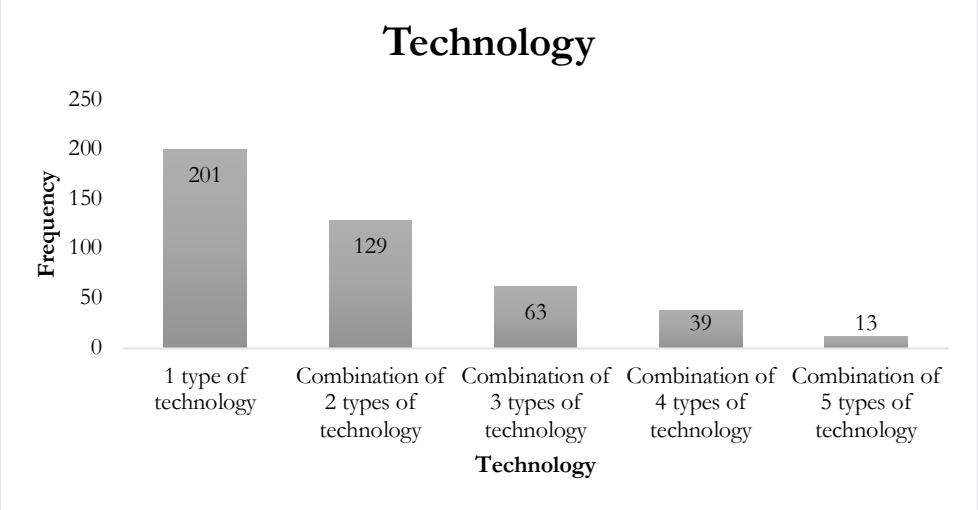

Figure 4-3: Agent technology usage

Table 4-11: Agent technological challenges

	Network failure		Phone problems		POS problems	
	Frequency	Valid Percent	Frequency	Valid Percent	Frequency	Valid Percent
Always	3	0.7	0	0.0	2	1.6
Often	16	3.6	9	2.0	25	20.2
Sometimes	185	41.7	137	30.9	50	40.3
Rarely	201	45.3	260	58.7	32	25.8
Never	39	8.8	37	8.4	15	12.1

ii. Training

Training was measured on one nominal scale and a Likert scale. The nominal scale sought to find out whether agents received training prior to or on the onset of operations as an agent. The greater majority (n=321) received training. Noteworthy, however, was the high item non-response on the yes/no training question. Item non-response refers to when respondents decline to answer individual questions (Bosnjak & Tuten, 2006). The non-responses accounted for 20% of the sample (n=90). There was no other question that had that high number of missing responses. The second highest was the two questions on finances which had 10 non-responses each. Wachira (2018) experienced the same non-response from agents on financial questions. Item non-response on sensitive issues such as income has been documented before (Riphahn & Serfling, 2005). The sensitivity of an issue, trust in the researcher-participant relationship and cost-benefit consideration have been found to reduce respondent's willingness to answer certain questions (Riphahn & Serfling, 2005). In this case, initial training is mandatory and disclosing that they were not trained may have been considered by some respondents as self-implicating.

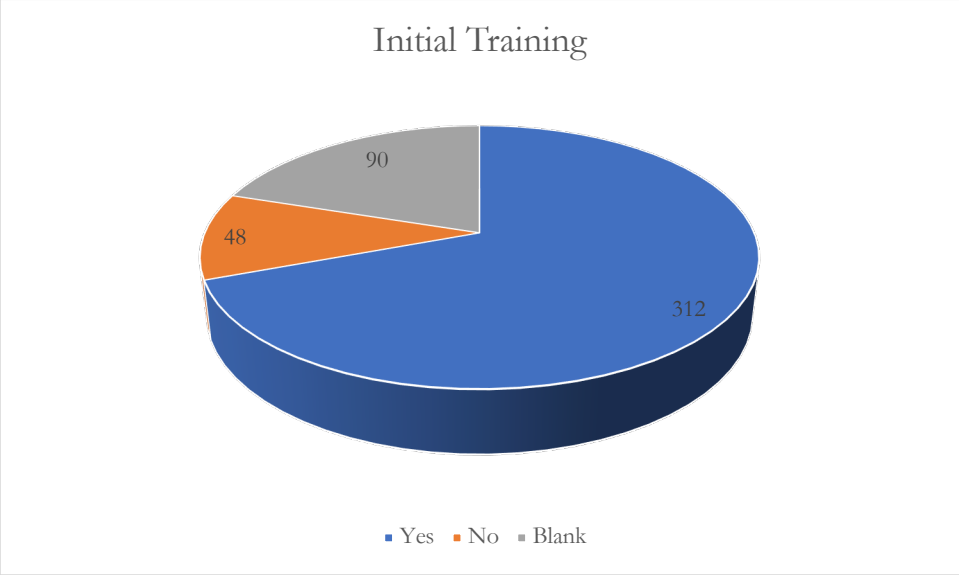

Figure 4-4: Agent initial training

Table 4-12: Agent training

	Fake ID & currency		Refresher training		Enough training	
	Frequency	Valid Percent	Frequency	Valid Percent	Frequency	Valid Percent
Strongly disagree	3	0.7	2	0.5	7	1.6
Disagree	48	10.8	53	12.0	64	14.5
Neutral	19	4.3	64	14.5	117	26.5
Agree	225	50.7	210	47.6	149	33.8
Strongly agree	149	33.6	112	25.4	104	23.6

Training questions sought to find out whether agents had been trained on specific skills such as fake cash detection, whether banks and MNOs offered refresher training and whether the training offered was sufficient. The majority affirmed that they had received training. However, there was no overwhelming consensus on the sufficiency of training, with only 57% agreeing. Cumulatively, those who were neutral and those who did not consider the training offered to be sufficient accounted for 42.6%.

4.5.3 Environment

Environment was measured on two Likert scales. The first measured an agent's knowledge of existing legislation in such areas as KYC, suspicious transaction reporting and customer data privacy and confidentiality was probed. *Table 4-13* shows that more than 60% in all cases were conversant with the prevailing legislation with most showing a higher awareness of confidentiality requirements than the rest of the legislation.

Table 4-13: Agent awareness of existing legislation

	Know Your Customer		Anti-money Laundering		Suspicious Transaction Reporting		Customer Privacy	
	Frequency	Valid Percent	Frequency	Valid Percent	Frequency	Valid Percent	Frequency	Valid Percent
Strongly disagree	11	2.5	7	1.6	4	0.9	6	1.4
Disagree	51	11.5	60	13.6	64	14.5	36	8.1
Neutral	87	19.6	100	22.6	99	22.4	55	12.4
Agree	263	59.4	234	52.9	226	51.2	224	50.6
Strongly agree	31	7.0	41	9.3	48	10.9	122	27.5

The second scale measured the socio-cultural factor of trust and agent's attitude towards customer service. 66.4% (n = 294) of agents trusted their customers and 62.2% (n = 275) had loyal customers who trust the agent. Customer loyalty to agents they trust has been reported before (Central Bank of Kenya, Financial Sector Deepening Kenya, & Kenya National Bureau of Statistics, 2016). On whether they reserve available float or cash for their regular customers or friends, 42.1% (n = 188) indicated that they treat all customers equally. 33.9% (n = 151) indicated preferential treatment while 24.0% (n = 107) were neutral on the issue. This concern has been noted before where agents have the capacity to perpetrate social exclusion and discrimination by denying strangers opportunities to transact while earmarking the funds for other customers (Rea & Nelms, 2017).

Table 4-14: Agent socio-cultural factors

	Agent-customer trust		Customer loyalty		Agent loyalty	
	Frequency	Valid Percent	Frequency	Valid Percent	Frequency	Valid Percent
Strongly disagree	5	1.1	6	1.3	80	17.9
Disagree	32	7.2	15	3.3	108	24.2
Neutral	103	23.1	41	9.2	107	24.0
Agree	263	59.0	204	45.5	132	29.6
Strongly agree	43	9.6	182	40.6	19	4.3

4.5.4 Compliance

Various aspects of compliance derived from legislation were measured on a Likert scale. *Table 4-18* shows that majority were compliant on most areas. Nevertheless, there was a higher inclination to non-compliance on liquidity, customer complaint handling and possession of relevant operational manuals.

Table 4-15: Agent compliance

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	Frequency	6	19	24	251	146
Customer ID	Valid %	1.3	4.3	5.4	56.3	32.7
	Frequency	3	41	100	216	86
Liquidity	Valid %	0.7	9.2	22.4	48.4	19.3
	Frequency	1	7	32	262	144
Transaction fees	Valid %	0.2	1.6	7.2	58.7	32.3
	Frequency	5	26	34	263	119
Customer hotlines	Valid %	1.1	5.8	7.6	58.8	26.6
	Frequency	0	20	77	223	127
Complaint handling	Valid %	0.0	4.5	17.2	49.9	28.4
	Frequency	2	15	47	259	122
Incident reporting	Valid %	0.4	3.4	10.6	58.2	27.4
	Frequency	9	72	73	169	124
Manuals	Valid %	2.0	16.1	16.3	37.8	27.7

4.6 Reliability and Validity Tests

First, an inter-item correlation matrix was obtained. The correlation matrix is attached as **Appendix C**. The highest correlation observed was 0.74 between two questionnaire items under legislation construct. 9 items had poor correlation, below 0.3. Two incidences are particularly of interest. 2 out of three questionnaire items that measured technological challenges correlated well with each other but the third correlated poorly with both. The two that correlated well concern mobile devices and telecommunications network connectivity while the third concerned POS device challenges. In reality, mobile phones and network connectivity go together while POS is a separate device that runs on a different system. None of the 3 sociological factors correlated well with each other. All 3 questionnaire items measuring sociological factors had poor common variance and were therefore removed from further analysis.

VIF values were then obtained through PLS-SEM to assess collinearity. From the results of the first PLS-SEM calculation, the 6 items were eliminated. 3 of them were measuring technological challenges and had shown poor variance on the inter-item correlation matrix. The other 3 items were measuring financial concepts and even though they had acceptable inter-item variance, they did not perform well on the VIF test and were therefore excluded. The 16 out of 25 items retained had acceptable thresholds of correlation on both tests. These results indicate that the individual questionnaire items and the instrument were reliable to a good extent.

Table 4-16: Collinearity values

Variable	**VIF**
Customer ID	1.48
Liquidity	1.52
Transaction fees	1.68
Customer hotlines	1.67
Complaint handling	1.89
Incident reporting	1.94
Manuals	1.83
Know your customer	2.67
Anti-money laundering	2.76
Suspicious transaction reporting	2.18
Customer privacy	1.81
Agent security	1.56
Customer security	1.56
Counterfeit recognition	2.16
Refresher training	3.16
Sufficiency of training	2.26

4.7 Proposition Testing and Model Quality Assessment

The propositions in *Table 4-* were posed following the development of the conceptual model in *Figure 4-5*. The software settings for each of the PLS-SEM computations performed are presented in **Appendix D**.

Table 4-16: Study Propositions

Proposition 1 (P1)	*An agent's business structure will influence compliance*
Proposition 2 (P2)	*An agent's operational strategy will influence compliance*
Proposition 3 (P3)	*An agent's external environment will influence compliance*
Proposition 4 (P4)	*Strategy has a greater influence on compliance than structure and environment.*

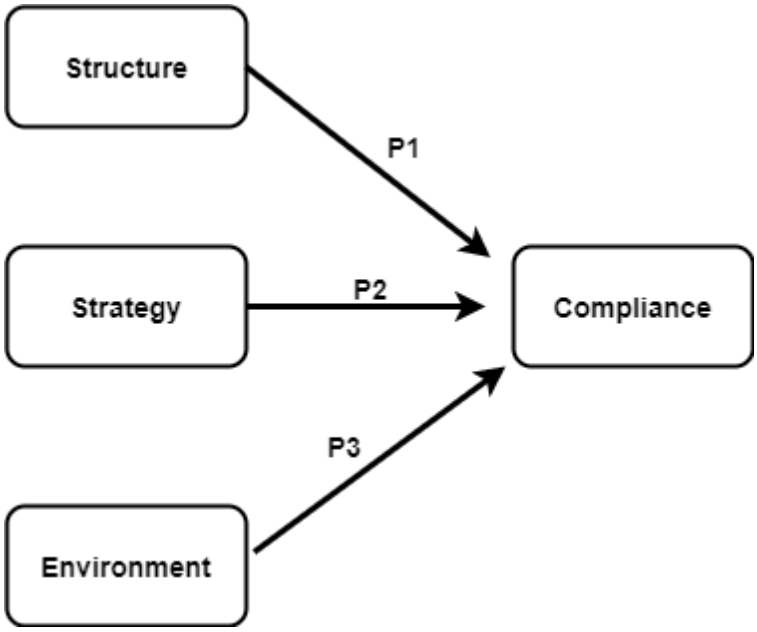

Figure 4-5: Conceptual Model with Propositions

4.7.1 Measurement model assessment

Table 2-1 presents collinearity composite reliability values as well as the results of the bootstrapping technique. Variance inflation factors (VIF) values of 3 and lower are ideal, with values of greater than 5 suggesting potential collinearity problems (Hair et al., 2019; Ringle & Sarstedt, 2016). For composite reliability, Rho_A of at least 0.70 for each construct is expected (Ringle et al., 2014).

Table 4-17: Outer weights, outer loadings, collinearity & statistical significance

	Outer Weights	Outer Loadings	VIF	T Statistics	P Values	Composite Reliability (rho_A)
Customer ID	0.19	0.58	1.48	**2.93**	**0.00**	
Liquidity	0.21	0.69	1.52	**3.03**	**0.00**	
Transaction fees	-0.14	0.45	1.68	**2.11**	**0.04**	
Customer hotlines	0.34	0.72	1.67	**5.13**	**0.00**	1
Complaint handling	0.07	0.6	1.89	0.96	0.34	
Incident reporting	0.04	0.62	1.94	0.47	0.64	
Manuals	0.56	0.89	1.83	**7.5**	**0.00**	
Know your customer	0.03	0.77	2.67	0.27	0.79	
Anti-money laundering	0.42	0.89	2.76	**2.72**	**0.01**	1
Suspicious transaction reporting	0.53	0.93	2.18	**4.96**	**0.00**	
Customer privacy	0.16	0.7	1.81	1.47	0.14	
Agent security	0.84	0.98	1.56	**7.97**	**0.00**	1
Customer security	0.24	0.74	1.56	1.75	0.08	

Counterfeit recognition	0.23	0.82	2.16	**2.73**	**0.01**	
Refresher training	0.54	0.96	3.16	**5.65**	**0.00**	1
Sufficiency of training	0.33	0.87	2.26	**3.24**	**0.00**	

There was no multicollinearity on any of the questionnaire items. Only one indicator had a negative weight. Cenfetelli & Bassellier (2009) suggest that an indicator with a negative weight but is not collinear and is statistically significant should be retained and only culled if it continuously shows different behaviour from other indicators in the construct. The indicator with a negative weight (transaction fees) was statistically significant and was therefore retained. There were 14 indicators whose weights were not significant based on both T-values and P-values. Weights are a suggestion of the contribution of the indicator(s) to the construct. Therefore, low and non-significant weights suggest that the observed indicator makes little or no contribution to the construct being measured. Non-significant weights do not necessarily mean that the quality of the measurement model is poor (Hair et al., 2019). In such instances, the loadings should be considered. If both the weight and loadings are not significant, that is grounds to remove the indicator (Cenfetelli & Bassellier, 2009; Hair et al., 2019). However, it can be retained if:

i. The weight (relative contribution) is low but the loading (absolute importance) is high, not less than 0.50, which shows that the indicator is absolutely but not relatively important to the construct (Cenfetelli & Bassellier, 2009; Hair et al., 2019).
ii. No theoretical overlap exists between the indicator and others in the same construct (Cenfetelli & Bassellier, 2009).

Such retention is still subject to the theoretical relevance of the indicator being further substantiated. Using the above criteria, 9 indicators were culled. The remaining 5 indicators with non-significant weights had corresponding higher loadings which suggests their absolute importance to the construct, but their relative contribution compared to other indicators is weak. Each of the indicators measured a theoretically distinct aspect of the construct. For instance, complaints handling and incident reporting measured customer complaints handling and fraud and theft reporting respectively while know your customer and customer privacy measured KYC procedures and information privacy respectively. There were no theoretical overlaps in the indicators under scrutiny.

Intensive means of testing the significance and theoretical relevance of an indicator exist but require data from previous studies using the same construct which provides indicator weights comparison across studies (Cenfetelli & Bassellier, 2009). This being an exploratory study with no other DFS compliance study to compare with, that option was not available. The second option is to edit the scales in the questionnaire and test until all weights are significant (Marakas, Johnson, & Clay, 2007). This option too could not be executed as it applies to longitudinal studies that allow for multiple data collection. Marakas et al. (2007) caution against removing indicators that are important to a construct because if their theoretical content is valid, the removal would change the nature of the construct. The cautious treatment of indicators is affirmed by Cenfetelli & Bassellier (2009) who point out that negative or non-significant weights can be as a result of different problems.

The 5 indicators were retained on the basis of absolute importance, no multicollinearity and no theoretical overlaps. Such a decision requires subsequent discussion on how the measurement of that indicator can be improved (Cenfetelli & Bassellier, 2009). The 16 out of 25 indicators carried on for further analysis are presented in *Table 4*-.

4.7.2 Structural model assessment

Table 4-19 presents R^2 values which shows the in-sample predictive power of the model and the results of the blindfolding technique that yields the Q^2 coefficient, which provides insights of both in-sample and out-of-sample explanatory power. Table 4-20 shows the results of PLSpredict, a measure of out-of-sample prediction error Hair et al., 2019).

The higher the values of R^2, the higher the predictive power. 0.25, 0.50 and 0.75 are considered weak, moderate and substantial respectively (Hair et al., 2019). Similarly, higher values of Q^2 indicate a good model with 0, 0.25 and 0.50 depicting small, medium and substantial predictive power (Hair et al., 2019).

Table 4-19: R Square, R Square Adjusted and Q Square

	R Square	R Square Adjusted	Q^2
Compliance	0.57	0.57	0.24

Table 4-18: PLSpredict output

	PLS RMSE	LM RMSE
compliance1	0.71	0.71
compliance6	0.66	0.65
compliance5	0.71	0.70
compliance7	0.80	0.81
compliance3	0.61	0.61
compliance2	0.75	0.76
compliance4	0.67	0.67

By the R^2 and Q^2 values in *Table 4-19* and prediction error values in *Table 4-18*, the structural model in this study has moderate in-sample explanatory power and low to medium out-of-sample predictive power.

Table 4-21: Structural model significance and confidence intervals

							Confidence interval	
Path	**Original Sample (O)**	**Sample Mean (M)**	**(STDEV)**	**T Statistics**	**P Values**	**f^2**	**2.50%**	**97.50%**
Environment -> Compliance	0.21	0.22	0.05	4.02	**0.00***	0.05	0.12	0.32
Strategy -> Compliance	0.53	0.53	0.05	10.39	**0.00***	**0.30**	0.42	0.63
Structure -> Compliance	-0.14	-0.14	0.04	3.24	**0.00***	0.04	-0.22	-0.05

***p < 0.001**

Path coefficients are a measure of the relationships hypothesized between constructs (Hair et al., 2014; Roky & Al Meriouh, 2015). Bootstrapping technique, which examines the path coefficients, was used to test propositions in this study. Bootstrapping also examines the significance level. A p-value < 0.001 with a corresponding t-value >/= 3.29 denotes a very highly significant relationship. A p-value < 0.01 with a corresponding t-value >/= 2.57 denotes a high significant relationship, and p-value < 0.05 with a corresponding t-value >/= 1. 96 denotes a significant relationship (Roky & Al Meriouh, 2015).

The first two paths had p-values of < 0.000 each and the third path had 0.001 before the figures in *Table 4-* were rounded off to 2 decimal places. With their corresponding t-values or 4.02, 10.39 and 3.24, the first two denote a very highly significant relationship while the third denotes a highly significant relationship. All the relationships proposed in this study were found to be significant, and all the propositions were supported as shown in *Table 4-* with the relationship between strategy and compliance being the most significant as proposed in P4. These results served the first two objectives of this study, which sought to establish the effect of structure, strategy and compliance.

Table 4-22: Effect of structure, strategy and environment on compliance

Proposition	Path	T Statistics	P Values	Results
P1	Environment -> Compliance	4.02	**0.00**	Supported
P2	Strategy -> Compliance	10.39	**0.00**	Supported
P3	Structure -> Compliance	3.24	**0.00**	Supported
P4	Strategy -> Comp > Envt, Structure -> Comp			Supported

4.8 Agent Archetypes

The third objective for this study sought to group agents based on their compliance behaviour and derive insights from any similarities and differences among groups. Two-step clustering automatically determines the appropriate number of clusters. The analysis yielded two clusters.

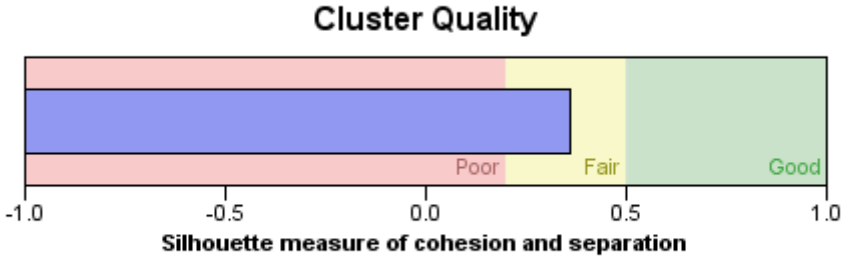

Figure 4-6: Cluster quality

The clustering quality, in this case, fell in the fair range with a measure of approximately 0.40.

4.8.1 Demographic profiling

A total of 323 out of the entire sample of 450 were used for this analysis. The clustering algorithm automatically excludes cases with missing data and groups together cases that appear to provide similar responses for the observed variable. Cluster 1 had 53 cases while the 270 majority went to cluster 2. Some questionnaire items like job status, age, gender and business security were excluded as they didn't show any discernible difference in patterns between the clusters and their inclusion reduced the cluster quality. Business security questionnaire items were also excluded for the same reason.

There is no established matrix for compliance among DFS agents. The degree of compliance to certain requirements can be measured by assigning consecutive numerical values to each compliance level (Archibus, n.d.). In order to rank the status of DFS agents, a matrix with 4 levels was created with 1 for Low, 2 for Medium-Low, 3 for Medium-High and 4 for High compliance. Low would comprise of agents who are non-compliant on all, and Medium-Low those who were not compliant on most of the compliance items measured. Conversely, High would comprise of agents who are compliant in all while Medium-High would comprise of those who were compliant on most of the compliance items measured. There were no cases of compliance or non-compliance with all the items. *Table 4-* shows that Cluster 1 was in the

neutral position on 5 of the items and non-compliant on 2 while Cluster 2 was compliant on 5 and neutral on 2 items. That places Cluster 1 on Medium-Low and Cluster 2 on Medium-High on the matrix.

Table 4-19: Demographic characteristics within clusters

	Cluster 1 (N=53)	Cluster 2 (N=270)
Education Level		
Primary school	5	8
Secondary school	24	74
College certificate	15	50
College diploma	6	70
Bachelor's degree	3	60
Masters or PhD	0	8
Agency age		
< 1 year	28	58
2-4 years	23	148
5-7 years	1	59
8-10 years	0	4
> 10 years	1	1
Multiple agency services		
Yes	5	129
No	48	141
Float		
< 10,000	5	8
10,000-20,000	11	53
20,000-50,000	19	77
50,000-100,000	16	67
>100,000	2	65
Commission		
< 10,000	23	27
10,000-20,000	18	119
20,000-50,000	8	72
50,000-100,000	4	37
>100,000	0	15
Technology		
1 type of technology	36	104
2 types of technology	16	80
3 types of technology	1	47
4 types of technology	0	29
5 types of technology	0	10

Training		
Yes	22	264
No	31	6

From *Table 4-*, Cluster 1 was characterized by relatively lower educational level, less experience in agency banking, lower float and commission thresholds. They also had a lower utilization of technology and had more untrained agents among them than those who had received training. This group can be described as *Low resourced, Untrained, Medium-Low Compliance*. Cluster 2 on the other hand had a higher representation in higher education, had agents with longer agency banking experience, higher float and commission thresholds. They were more likely to be using a combination of up to 5 different technologies and only 6 out of 270 had not received training. This group can be described as *Well resourced, Trained, Medium-High Compliance*.

4.8.2 Behavioural profiling

Table 4-20: Two-step clustering output

	Cluster 1	Cluster 2
Fake ID & currency	2.70	4.36
Refresher training	2.42	4.14
Enough training	2.49	3.85
Know-your-customer (KYC & CDD)	2.57	3.80
Anti-money-laundering (AML)	2.40	3.81
Suspicious Transaction Reporting (STR)	2.62	3.74
Customer Data Privacy	2.92	4.13
Customer ID verification	3.40	4.30
Liquidity	2.98	3.90
Transaction fees display	3.83	4.26
Customer hotlines display	3.21	4.19
Complaint handling protocol	3.66	4.09
Incident reporting protocol	3.53	4.16
Possession of Manuals	2.51	3.98

From *Table 4-*, Cluster 1 agents responded below average on all aspects of training. They scored below average on awareness of all the four legislations tested. There was non-compliance in two questionnaire items and the remaining were neutral. Cluster 2 responded affirmatively to training questionnaire items although they are neutral on the item that asked whether the training offered by MNOs and banks is enough. They were neutral on three out of 4 items on legislation awareness and scored well on the fourth that tested awareness towards customer information privacy and confidentiality. They were compliant on 5 out of 7 questionnaire items and neutral on 2. In general, majority of the agents in the entire sample appear compliant but from patterns observed in both clusters, legislation awareness is not very high and compliance in the areas of liquidity and possession of relevant documentation and manuals is low. These findings mirror those obtained through PLS-SEM. Although some items were culled to improve cluster quality, training which now constituted strategy still had the largest effect, with the scores of the less compliant cluster being lower for strategy than for any other construct.

Similarly, the second largest effect was legislation awareness, for which the less compliant cluster also had low scores. In other words, compliant agents clustered together and had higher levels of training (strategy) and legislative awareness (environment) compared to the less compliant cluster whose strongest distinction was lower levels of training and legislative awareness. That is in line with the propositions posited and confirmed by the tests which indicated that strategy had the strongest influence on compliance, followed by environment and structure had the least effect. Besides profiling agents into archetypes, the results of cluster analysis support the configuration theory conceptual model developed.

4.9 Data Analysis Summary

In summary, the respondents of this study were 45.1% male and 51.8% female and the majority (53.3%) were aged between 18-30 years. There was a fair distribution between agents that owned their business (48.9%) and those who were employed (51.1%) and 52.9% were doing it as their first job while 47.1% had prior experience. More than half (52.4%) had a primary business alongside the agency business while 47.6% operated DFS services a standalone business. Majority of agents (59.5%) offered services for only one bank/MNO while the rest (40.5%) offered services for multiple banks/MNOs. The observations showed that agency businesses tended to be relatively young, with 2-4yrs accounting for 54.4%, under 1 year 26% and the remaining 19.6% distributed between 5-10 years. On liquidity, float varied mostly between 10,000-100,000 with 20,000-50,000 having a slight majority of 29.8%. Commission earned had higher frequencies between under 10,000 to 50,000 with the highest frequency falling under 10,000-20,000 a month.

Classified in clusters, two heterogeneous clusters emerged, with a majority of agents (Cluster 2, n = 270) fell in the Medium-High compliance cluster that was also trained and had better awareness of existing legislation. The Medium-Low cluster (Cluster 2, n = 35) exhibited no to low training and unfamiliarity with existing legislation. Some differences between the two clusters were educational levels and financial levels where Cluster 2 had higher levels and Cluster 1 had lower levels of both respectively. Some similarities observed include a pattern of relatively lower scores on legislation awareness and non-compliance on liquidity and possession of manuals.

Assessment of the structural model showed that Environment had a very highly significant relationship to Compliance ($p < 0.000$, t-value = 4.02). Strategy exhibited another very highly significant relationship to Compliance ($p < 0.000$, t-value = 10.39). Structure, which had the lowest effect relative to the other two constructs, still had a highly significant relationship to Compliance ($p = 0.001$, t-value = 3. 24). As proposed, Strategy had the strongest effect on Compliance. In terms of the variance explained, in-sample explanatory power was moderate ($R = 0.57$) while out-of-sample predictive power ($Q = 0.24$) and predictive errors (RMSE) were in the low-medium range. The model fit was substantial.

5 Findings and Discussion

5.1 Introduction

This section discusses the findings of the study in relation to the research questions presented in **Section 1.2** and propositions formulated in **Section 2.5.3**. The primary question that encompassed the purpose of this research was: *"How do operational factors affect compliance of DFS agents with agency banking legislation and standards in Kenya?"* The following four sub-questions were posed to answer the primary research question:

1. *What influence does the business structure of a DFS agent have on compliance?*
2. *What influence does the strategy of a DFS agent have on compliance?*
3. *What influence does the environment of a DFS agent have on compliance?*
4. *What are the common archetypes by compliance status among digital financial service agents in Kenya?*

5.2 Overview of the study and empirical findings

To answer the research question, a conceptual model based on Configuration Theory was developed. Miller's (1986) conceptualization of organisational components was used to derive four constructs that represent the DFS agent business that is: 1) Structure, 2) Strategy, 3) Environment and the outcome (dependent) construct 4) Compliance. Four propositions were formulated based on the four constructs. Quantitative data collected from DFS agents using a questionnaire was analysed to validate the model and test the study propositions. Findings showed that the model developed explained compliance among DFS agents and that strategy, structure and environment affected compliance, with strategy showing a greater effect than the rest. In addition, other findings related to the constructs were relatable to the existing literature on DFS agents.

5.2.1 The role of Structure

It was established that structure has a highly significant effect on compliance. This construct was measured using questionnaire items such as education level, business experience, and financial resources. Concerns about lack of physical security at agent premises raised by Njeru & Makau (2014) and Githae et al. (2018) were not confirmed. Agents predominantly disagreed that they and their customers had any security fears related to the business location.

When agent archetypes were drawn, some of these structural characteristics showed distinguishable patterns in each archetype. From cluster analysis, 60% (N = 270) of agents clustered under *Well resourced, Trained, Medium-High Compliance*, 11.7% (N = 53) under *Low resourced, Untrained, Medium-Low Compliance*. These two archetypes show that most agents have the human, financial and technological resources required to run an agency business within the minimum required standards. In addition to offering an overview of the state of compliance, these archetypes also offer insights on agent demographic characteristics that showed patterns of relationship to the compliance status. Some of the key patterns observed involve the level of education, agent business experience and training. The first two fall under structure.

i. Education level

There doesn't appear to be a consensus in studies about the level of education among agents. In general, however, the majority appear to fall between high school and college qualifications. There is a notable increase in the number of agents with undergraduate and postgraduate degrees. Atandi's (2013) study had no respondents with university qualifications but Katela's (2017) had 29.8%, Karanja's (2018) had 4.2% and Wachira's (2018) had 17.9% university degree holders. This study recorded 21.7% of agents with a bachelor's degree and above. The

disparities could be as a result of the locations where each study was conducted. Education levels vary from urban to rural areas in Kenya, with urban areas having higher literacy levels (Egede, Voronca, Walker, & Thomas, 2017). Atandi's (2013) study was localized to one county which falls in the remote, rural category. Katela's (2017), Karanja's (2018) and Wachira's (2018) studies were all conducted in the capital city Nairobi which has relatively higher literacy levels than other urban areas. This study's sample was distributed across five counties including Nairobi and random sampling ensured that responses from both rural and urban agents were captured.

Apart from demographic purposes, the implication of the education level of agents has not been discussed much by previous studies. Peša (2018) claims that there is no causal link between good performance as an agent and the level of education. This claim may not be entirely accurate, although the relationship between an agent's education on outcomes such as transactions volumes has been deemed hard to predict (Cull et al., 2018). While the causal relationship may not be linear, education level does affect the overall business performance although the effect may be mediated or moderated by other factors such as capital outlay and on-the-job training. For instance, in this study, the Medium-High compliance cluster also had agents with low educational qualifications, but this cluster was also characterized by relatively better liquidity, more experience in running agency business and 97.7% training. On the cluster characterized by lower education levels and liquidity, experience and training were also low, compliance was also low.

ii. Skills, entrepreneurial and work experience

Githae, Gatauwa, & Mwambia (2018) explore the issue of limited skills among DFS agents in comparison to bank tellers. The contrast between the requisite skills and professional development required for bank employees and the minimum requirements set for agents raises the question of agents' ability to uphold the same standards for financial services. Githae et al. (2018) point out that some agents lack the capacity to effectively employ technology for more business efficiency and profitability. Banks and MNOs have difficulties recruiting qualified agents as most lack the skills and competence necessary to handle the services and customers (Kim et al., 2018). Findings from this study confirm that notion. Agents with lower education levels were also characterized by lower utilization of technology and earned lower commissions than agents with higher education levels.

Education and work experience have been linked to better overall business performance as better educated agents are likely to have better business acumen (Cull et al., 2018; Githae et al., 2018). Potential implications of the level of education on agency banking have already been highlighted. Majority of agents as seen in this, Katela's (2017) and Karanja's (2018) studies are aged between 18-30. Typically, that is the age when most people are beginning their careers formally or informally. More than half of the agents in this study indicated that being an agent was their first job. Therefore, there is not much work experience to count on, as Peša (2018) also observes in a Zambian study. Prior work experience buttresses other characteristics of the agent. In some cases it could even make up for low levels of education as one successful agent with low education in Zambia pointed to their "…'business sense' gained through previous work experience in trade" (Peša, 2018, p8). Eijkman, Kendall, & Mas (2010) also provided an example of Gaudencia, an agent in Kenya who had not completed primary school. She owned three profitable agent stores run with the help of employees, but she had oversight on customer service and liquidity, shuttling across the three business locations daily for management. Before being an agent, she was a chicken seller. On the contrary, lack of prior experience leads to poor management of the small business and eventually leads to failure (Mungai, 2016).

The length of time the agency business has been in operation has also been found relevant to liquidity management (Wachira, 2018). Most agency businesses tend to be aged between 1-4 years as observed in Katela's (2017), Wachira's (2018) and this study which had 78.5%, 76.1%, and 54.4% agents respectively in this category. The second-largest category is agents under 1 year. Majority in Mungai's (2016) study were aged between 1-5 years. The number of agents from 5 years upwards then decreases drastically with no study accounting for more than 1% of agents older than 8 years. This is a concern as MNO-led agency banking is 13 years old in Kenya and bank-led is 10. If the majority of agents are 4 years and under, this likely suggests a high agent turnover. Agency age is significant for sustainability as older agents have substantially higher transaction volumes than younger ones which means their commissions are also more stable (Cull et al., 2018).

Agents build their liquidity management skills over time as they learn how to anticipate demand and plan for float and cash balancing (Wachira, 2018). With time, they are also likely to establish relationships with stakeholders such as banks and aggregators who can advance float to them in times of high demand. Younger agency businesses are not able to leverage these benefits. Consequently, having to decline transactions every so often due to lack of cash or float means loss of income in commissions and reputational damage (Peša, 2018). If that is a recurring issue, the agent in such a situation would not only be uncompliant but also runs the risk of eventually going out of business. Liquidity is therefore very potentially linked to a high turnover in agency banking. Indeed, Peša (2018) observes that agents without sound financial management of the agency business are likely to struggle, fail and close the business within 6 months of opening.

In addition to experience as a result of longevity, agents who have other business activities alongside agency services are likely to have cash from other sales (Davidson & Leishman, 2010). Having a primary or side business diversifies the source of cash that can be depended on for agency transactions and also spreads the risks in case the agency is not performing well on its own (Peša, 2018). Balancing these ventures efficiently requires business acumen that is hardly acquired in school (Peša, 2018). Similar to the age of the agency business, an agent's primary (non-agency) business has been positively linked to agent transactions as more established businesses are more trusted and have experience in customer service (Cull et al., 2018).

5.2.2 The role of Environment

Environment was measured using awareness of legislation and sociological factors. Sociological factor questionnaire items were excluded from analyses for failing to meet validity and reliability scores. Majority of agents are fairly informed about existing legislation although the average score leaned towards a neutral position than explicit agreement. The only legislation that nearly all agents showed strong familiarity to was customer information confidentiality. Even agents on the *Low resourced, Untrained, Medium-Low Compliance* cluster had a relatively higher score on that legislation than the other three examined. These findings are contrary to Githae et al.'s (2018) who found that agent's divulged customer information unaware of the breach of confidentiality requirements.

5.2.3 The role of Strategy

Strategy was measured using questionnaire items that checked the agent's level of training and the technologies they use. Training was a key distinguishing factor between the two clusters, with the *Medium-Low Compliance* group being predominantly untrained. Even though certain entrepreneurial skills are inborn, training plays a huge role. Lehman (2010, p1) describes an effective agent as "…well trained; trusted by customers; strategically and conveniently located; and properly incentivized to follow procedures, keep sufficient float on hand, and serve

customers." Majority of the agents in this study agreed that they had been trained before starting agency banking, that banks/MNOs provided refresher training whenever there were new products or changes to the system but were neutral on whether the training offered was enough to help them cope with all their operational challenges. These findings tend to agree with previous studies. Katela (2017) found that agents had been trained by the relevant institutions. However, the study didn't delve deeper to find out whether the training was considered sufficient by agents. In Githae et al.'s (2018) study, agents were neutral on their pre-agency banking training but disagreed that they had been trained to combat fraud by detecting fake IDs and cash. They also disagreed that banks continuously provided them with training to improve on-the-job skills. Therefore, training before starting agency business doesn't appear to be much of a problem but the amount and quality of ongoing training seem unsatisfactory to the agents.

Banco de Credito del Peru highlighted training and managing rural agents as a particularly unique challenge (Lehman, 2010). Rural agents are the most in need of training as observed in this study that they are the least likely to be well educated and aware of legislation and standards. Incidentally, such areas are also the ones with the most unbanked populations as there's lower proximity to banks (Githae et al., 2018). Therefore, those agents are critical and their inability to offer formal financial services competently hampers financial inclusion.

The National Payments Act of 2014 requires that in addition to training, agents be furnished with manuals to serve as a reference point for policies and guidelines for safe and efficient customer service (Central Bank of Kenya, 2014). Yet, most of the agents in this study, trained and untrained, did not have them. Davidson & Leishman (2010) explore agent network management across different countries in Sub-Saharan Africa and South-East Asia. Branding, training and monitoring procedures are detailed. Only the starter kit for agents in Thailand is mentioned to contain manuals for agents with step-by-step instructions.

Liquidity, as highlighted in numerous studies, continues to be a challenge (Atandi, 2013; Githae et al., 2018; Katela, 2017; Njeru & Makau, 2014). In this study, the untrained agents were uncompliant on liquidity, and the well trained and resourced agents were neutral. Half of the agents in Wachira's (2018) study said they had not been trained on liquidity management, despite having received initial training. While liquidity problems appear to be universal and enduring, characteristics such as entrepreneurial experience and level of training help some agents to manage liquidity better than others.

5.3 Summary

Table 5-1: Key findings by construct

Structure	▪ Liquidity is a persistent challenge among agents ▪ The role education level plays is not clear although the more compliant cluster had agents with higher education levels compared to the cluster with lower compliance ▪ Physical security concerns raised by Njeru & Makau (2014) and Atandi (2013) were not confirmed. Responses on security predominantly indicated that security for agents and customers were not a major concern.
Strategy	▪ Most agents only have the basic technology required to transact, that is, phones and POS devices. There are fewer with additional devices such as cash counting machines and CCTV cameras that enhance security and reduce chances of fraud. ▪ Initial training is not an issue for most agents, but most agree that the amount of ongoing training is insufficient.

Environment	▪ Agents are mostly familiar with customer confidentiality requirements. There are gaps in awareness of other legislation.
Compliance	▪ Majority of agents are compliant with many of the legislative requirements, but liquidity and possession of operational manuals was a cross-cutting challenge.

An agent's exposure to financial management, technology optimization and other business standards and procedures has direct implications on business performance and compliance. While a higher level of education is likely to equip agents with some transferable skills, agents come from various fields, some of which may not have much to offer in the entrepreneurial skills needed for agency banking. Liquidity management, awareness and adherence to legislation, and technology utilization to support business operations for efficiency, profitability and compliance are all concepts that can be trained. Skills shortage has been identified as an issue and so is lack of sufficient training (Rana, Luthra, & Rao, 2019). Therefore, as depicted by the highly significant effect of strategy on compliance, training is the one aspect of agent management that banks and MNOs ought to pay more careful attention to.

Compliance presents a holistic framework where all the challenges highlighted by previous studies can be viewed against the relevant legislation. This exercise has brought to light not only the overall state of compliance but also a highlight of the areas that need improvement. While the overall picture depicts that the majority of agents are Medium-High compliance category, some areas still need the attention of banks and MNOs the main being liquidity management and legislation awareness. Both can be addressed through proper training and reference materials which were both found insufficient in this study. The number of untrained agents is high, inferring that the 20% who declined to answer the yes/no training question may have been concealing their non-compliance. In addition, there was 10.6% who explicitly disclosed that they had not received initial training. Strategy, which was measured using technology and training questionnaire items had a much stronger effect on compliance than structure and environment. That suggests the level of attention that these aspects of the agent business require, both from the agents and from the institutions they offer services on behalf of.

6 Conclusion, Recommendations and Future Research

6.1 Introduction

This chapter draws conclusions from the whole research exercise. Further, contributions of this research to theory and DFS practice are presented. Finally, the study limitations and suggestions for further research are made.

6.2 Conclusion

This study sought to find out the role of operational factors on compliance in a DFS business. The overarching goal was to provide a holistic view of DFS organisations in terms of how they are structured and resourced, and whether they are aware of and complying with the legislations that govern DFS. Many aspects of DFS have been the subject of numerous studies over the last decade (Atandi, 2013; Githae et al., 2018; Karanja, 2018; Katela, 2017; Mungai, 2016; Onwonga et al., 2017; Wachira, 2018). Studies on adoption, challenges for agents and customers, impact on the economy, financial sector and society have provided insights that have helped various stakeholders to understand the model better from various perspectives. The compliance angle taken by this study provides a health check of the model by examining the stakeholder involved in last-mile delivery of this financial service channel. Besides barely identifying challenges as many studies have done extensively, this study sought to get a wholesome image of a DFS agent. Guided by configuration theory, various agent business aspects were categorized under structure, strategy and environment and compliance items derived from existing legislation.

The overall picture from the study is of fairly compliant agents with most falling under Medium-High compliance level albeit with areas that need strengthening especially legislation awareness, training and liquidity management. This adds a new aspect to the body of literature that has been investigating the model success in Kenya. However, the sentiments that the success witnessed in Kenya has not been possible to replicate in other contexts have persisted (Buku & Meredith, 2013; Dermish et al., 2012; GSMA, 2018; Lehman, 2010; United Nations Inter-agency Task Force on Financing for Development, 2019). Lehman (2010) posits that the key success factors for DFS in Kenya are not known and also speculates that there could be other factors that haven't been considered. Some context-specific success factors have been identified over time. One is the strong socio-cultural history of urban to rural remittances (Jack & Suri, 2011; Johnson, 2016). The second is an intentionally-fostered enabling regulatory environment (Buku & Meredith, 2013; Hughes & Lonie, 2007; Jenik & Lauer, 2017; Muthiora, 2015). Adding to the economic, socio-cultural and regulatory context available in literature, the agent archetypes and compliance status provided by this study offer additional criteria for understanding and evaluating the DFS model by stakeholders in Kenya and beyond.

6.3 Implications of the study

This section discusses the contribution of this study to theory and DFS practice

6.3.1 Theoretical Contributions

A model that can be used to explain and predict compliance outcomes among DFS agents has been developed and tested. Concepts from Configuration Theory and the organisational development field were applied to understand DFS agent businesses and conceptualize relationships among various elements of an agent's business. Application of these theories and concepts to DFS agents and the development of a model for the examination are novel and form the main contribution to theory.

In addition, compliance among DFS agents has not been explored before. The findings of this study add to the existing body of literature on DFS agents that sheds more light about the model and its stakeholders, the stakeholder of interest in this case being agents.

6.3.2 To practice

The proposed model offers agents, banks, MNOs and regulators knowledge of the factors that influence compliance. The model proposed showed that all the three elements, that is structure, strategy and environment contribute to compliance. Strategy, however, stood out with a greater effect. The analysis suggests that:

1. Banks and MNOs should revamp their initial and follow-up training programs. Additionally, the training should go beyond the obligatory training checklist and expand the training to other business skills such as liquidity management and cheap technology optimization. A high agent turnover was observed in this study and in literature and some of the factors identified especially relate to liquidity management. This rate of turnover can be reduced to improve stability and sustainability of agency banking. Such needed skills as liquidity management, technology optimization and better customer experience can be the subject of continuous agent training programs. Although agents indicated that they received initial and refresher training, 42.6% did not consider the training offered to be sufficient. The compliance matrix developed can also be used to classify agents and stratify training needs based on where each agent falls on the matrix so that follow-up training is more targeted than generic.
2. Agents should be proactive in seeking training, retraining and continuous personal and professional development opportunities, not only for compliance but to also improve their overall business performance and the likelihood of their agency business succeeding in the long term. Such can be done through enrolling for financial literacy, communications and public relations programmes.
3. Regulators should pay close attention to low legislation awareness and engage with banks and MNOs on how awareness campaigns and compliance monitoring can be carried out on an ongoing basis. Even the more compliant cluster of agents showed a low level of legislation awareness. To improve legislative awareness, regulators can develop materials such as explainer videos that break down complicated legislation such as Anti-money laundering in a way that even agents with lower education qualifications can understand what money laundering is, how it happens, what to look out for in customers and transactions, and the importance of reporting anything suspicious.

6.4 Limitations

The researcher was based in South Africa while conducting this study and was only in Kenya for data collection for one month. Therefore, due to time limitations, a pilot study was not conducted. This would especially have been important since the study was examining compliance among agents for the first time with a substantial number of questionnaire items being newly derived. To mitigate any methodological errors that may have arisen from the instrument development, 9 out of 25 items that did not satisfy instrument validity test thresholds were dropped from further analysis. The study acknowledges that taking the survey instrument through several iterations with test data could potentially have improved the phrasing or presentation of items in the final instrument, and consequently fewer items excluded from analysis and interpretation.

Secondly, the data used to measure compliance was from agent self-reporting and not from actual compliance. Even with the explanation of survey anonymity, social desirability bias may not have been fully mitigated.

6.5 Future research:

The approach taken by this study was positivist with quantitative data collected via a questionnaire. A qualitative study can be conducted to derive deeper insights from agents about

the elements in the model and compliance that a quantitative survey may not be able to capture. Having data from both perspectives would provide a deeper understanding of agents and their plight that can form even more focused interventions from banks, MNOs and regulators.

Longitudinal studies can also be carried out to investigate whether an agent's compliance status changes over time in response to changes in other elements of their business such as gaining experience, more capital, better financial management, and better technology utilization and training. An investigation can also be conducted on the moderating and mediating effects of agent demographic characteristics such as level of education and business age on compliance.

Lastly, this study only explored the first-order factor model of Configuration Theory which specifies the direct effects of independent variables on the dependent variable. Further insights can be derived from exploring the second-order model which specifies the effect among the independent constructs first, such as the effect of strategy on structure and vice versa, then the combined effect on compliance. Second-order effects would provide insights on how first-order factors can be best aligned to achieve compliance.

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Appendix A: Systematic Literature Review List of Articles

UNIVERSITY OF CAPE TOWN
FACULTY OF COMMERCE
Igniting Knowledge and Opportunity

Plagiarism Declaration

COMPULSORY DECLARATION:

1. This dissertation has been submitted to Turnitin (or equivalent similarity and originality checking software) and I confirm that my supervisor has seen my report and any concerns revealed by such have been resolved with my supervisor.
2. I certify that I have received Ethics approval (if applicable) from the Commerce Ethics Committee.
3. This work has not been previously submitted in whole, or in part, for the award of any degree in this or any other university. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works of other people has been attributed, and has been cited and referenced.

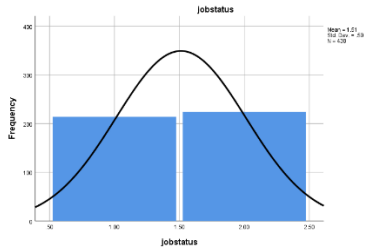
Student number	NJGREB001
Student name	Rebecca Wanjiku Njuguna
Signature of Student	
Date:	15th August 2020

23	Njeru, Bonita Christine Wawira; Makau, Godfrey	Factors influencing uptake of agency banking strategy in Kenya	2014	International Journal of Social Sciences and Entrepreneurship	Google Scholar
24	Alexandre, Claire; Mas, Ignacio; Radcliffe, Daniel	Regulating New Banking Models to Bring Financial Services to All	2011	Challenge	Google Scholar
25	Klapper, Leora; Singer, Dorothe	The Opportunities of Digitizing Payments	2014		Google Scholar
26	Dermish, Ahmed; Kneiding, Christoph; Leishman, Paul; Mas, Ignacio	Branchless and Mobile Banking Solution for the Poor	2012	Innovations: Technology, Governance, Globalization	Google Scholar
27	Atandi, Fred Gichana	Challenges of agent banking experiences in Kenya	2013	International Journal of Academic Research in Business and Social Sciences	Google Scholar
28	Mungai, Kiburi M.	Assessment of factors determining the performance of bank-led agent bank businesses in Kenya : case of Kiambu County	2016		Google Scholar
29	Klein, Michael; Mayer, Colin	Mobile Banking and Financial Inclusion:The Regulatory Lessons	2011	World Bank Policy Research Working Paper Series	Google Scholar
30	Jack, William; Suri, Tavneet	Mobile Money: The Economics of M-PESA	2011	National Bureau of Economic Research.	Google Scholar
31	Jenik, I.; Lauer, K.	Regulatory Sandboxes and Financial Inclusion	2017		Google Scholar
32	Hughes, Nick; Lonie, Susie	M-PESA: Mobile Money for the "Unbanked" Turning Cellphones into 24-Hour Tellers in Kenya	2007	Innovations: Technology, Governance, Globalization	Google Scholar
33	Karanja, Norah Nyokabi	Effect of fraud risk management practices on level of activity by agent banks in Nairobi County	2018		Google Scholar
34	Johnson, Susan	Competing visions of financial inclusion in Kenya: The rift revealed by mobile money transfer	2016	Canadian Journal of Development Studies	Google Scholar
35	Johnson, Susan; Nino-Zarazua, Max	Financial access and exclusion in Kenya and Uganda	2011	Journal of Development Studies	Google Scholar
36	Groppa, Octavio; Curi, Fernando	Mobile Money Regulation: Kenya, Ecuador and Brazil Compared	2016	SSRN Electronic Journal	Google Scholar
37	Wachira, Irene W	Factors affecting liquidity challenges among digital finance agents in Nairobi County	2018		Google Scholar
38	Githae, Lilian; Gatauwa, James; Mwambia, Felix	Factors Affecting Uptake of Agency Banking Services Among Customers in Rural Kenya: A Case of Narok County	2018	European Scientific Journal, ESJ	Google Scholar
39	Onsongo, Elsie; Schot, Johan	Inclusive innovation and multi-regime dynamics : The case of mobile money in Kenya	2017	SSRN	Google Scholar
40	Ozili, Peterson K.	Impact of digital finance on financial inclusion and stability	2018	Borsa Istanbul Review	Google Scholar
41	Nyaga, Joseph Kariuki	Mobile Banking Services in the East African Community (EAC): Challenges to the Existing Legislative and Regulatory Frameworks	2014	Journal of Information Policy	Google Scholar
42	Muthiora, Brian	Enabling mobile money policies in Kenya - Fostering a digital financial revolution	2015		Google Scholar
43	Munoru, Mark Kariuki	Effect of Agency Banking on Financial Inclusion in Kenya	2016	International Journal of Science and Research (IJSR)	Google Scholar
44	Maurer, Bill; Nelms, Taylor C.; Rea, Stephen C.	'Bridges to cash': Channelling agency in mobile money	2018	Linguistic and Material Intimacies of Cell Phones	Google Scholar
45	Malek, Bahiah A; Mohtar, Shahimi;Shabudin, Ahmad	The factor that affects the effectiveness of agent banking characteristics on financial inclusion performance	2017	Journal of Advanced Research in Business and Management Studies	Google Scholar
46	Dara, Nageswara Rao	The Global Digital Financial Services: a Critical Review To Achieve for Digital Economy in Emerging Markets	2018	International Research Journal of Human Resources and Social Sciences	Google Scholar
47	Rea, Stephen; Nelms, Taylor	Mobile Money: The First Decade	2017		Google Scholar

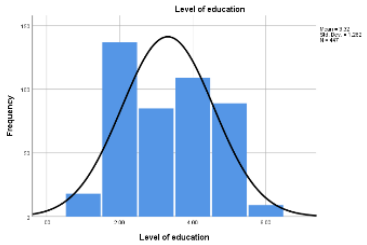
48	Buku, Mercy W; Meredith, Michael W	Safaricom and M-PESA in Kenya: Financial Inclusion and Financial Integrity	2013	Washington Journal of Law, Technology & Arts	Google Scholar
49	Peša, Iva	The Developmental Potential of Frugal Innovation among Mobile Money Agents in Kitwe, Zambia	2018	European Journal of Development Research	Google Scholar
50	Onwonga, Mactosh; Achoki, George; Omboi, Bernard	Challenges facing growth of agency banking in kenya: a case of kisii county	2017	International Journal of Research in Finance and Marketing	Google Scholar
51	Mugo, Matu	Regulation of Banking and Payment Agents in Kenya	2012	Innovations: Technology, Governance, Globalization	Google Scholar
52	di Castri, Simone; Gidvani, Lara	Enabling Mobile Money Policies in Tanzania: A 'Test and Learn' Approach to Enabling Market-Led Digital Financial Services	2014	SSRN Electronic Journal	Google Scholar
53	Gibson, Evan; Lupo-Pasini, Federico; Buckley, Ross P	Regulating digital financial services in developing countries to promote financial inclusion	2015	Singapore Journal of Legal Studies	Google Scholar
54	Katela, M.M	Challenges Facing Financial Service Agents: Case Study of Nairobi County	2017		Google Scholar
55	Morawczynski, Olga; Miscione, Gianluca	Examining trust in mobile banking transactions: The case of M-PESA in Kenya	2008	IFIP International Federation for Information Processing	Google Scholar
56	Central Bank of Kenya	Guideline on Agent Banking	2010		Google
57	Central Bank of Kenya	E-Money Regulation	2013		Google
58	Central Bank of Kenya	National Payment System Regulations	2014		Google

Appendix B: Normality Test Graphs

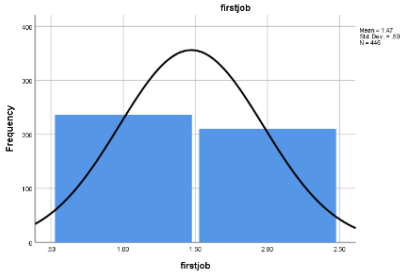
Histogram



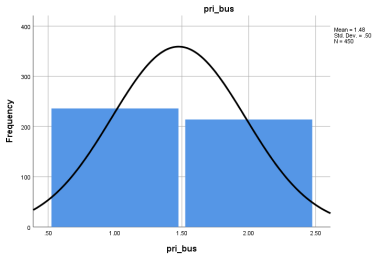
Job status



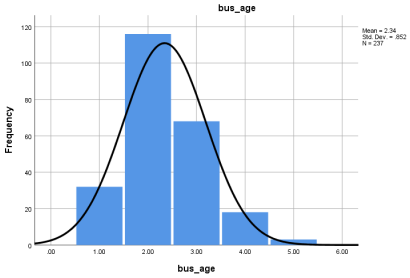
Level of education



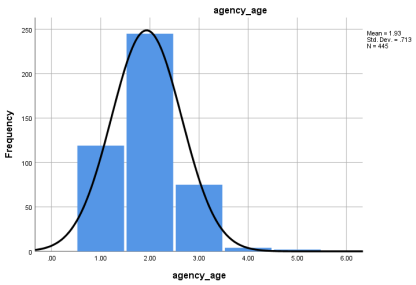
First job



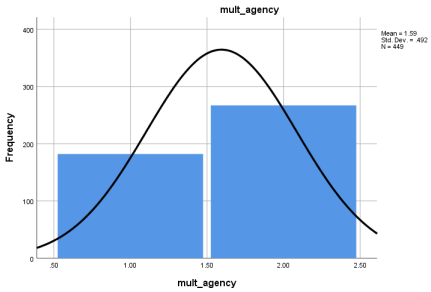
Primary business



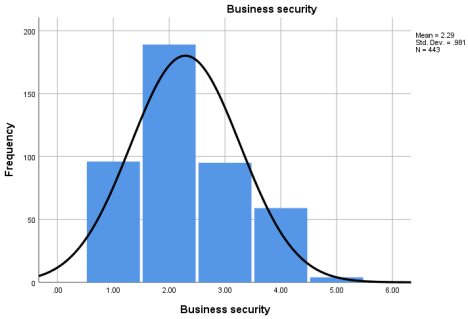
Business age



Agency age

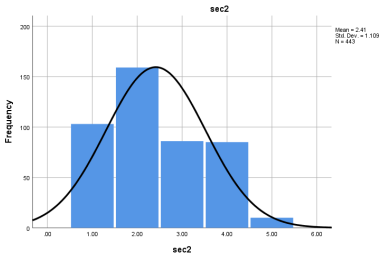


Multiple agency

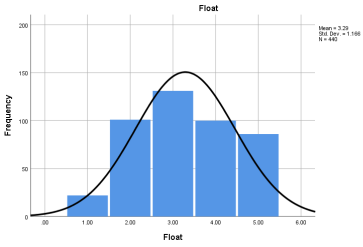


Agent security

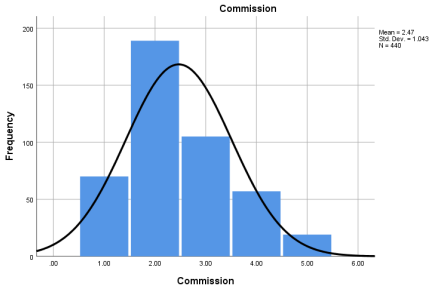
Histograms



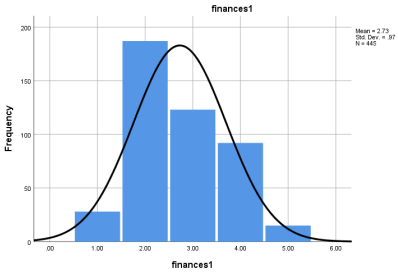
Customer security



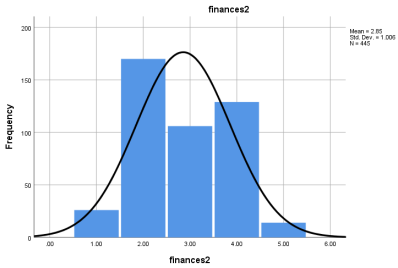
Float range



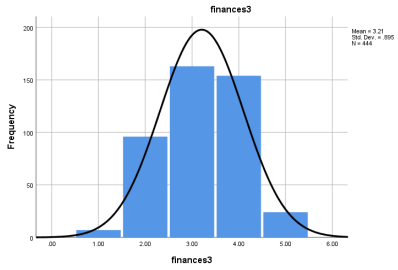
Commission range



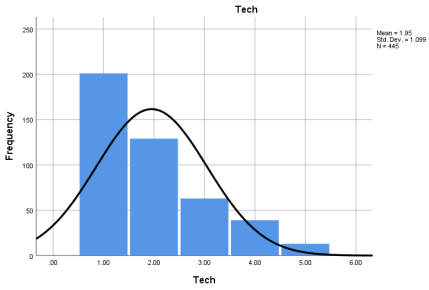
Liquidity



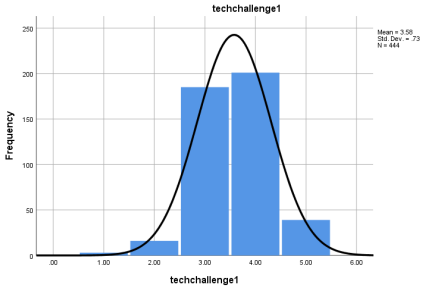
Source of funds



Commission

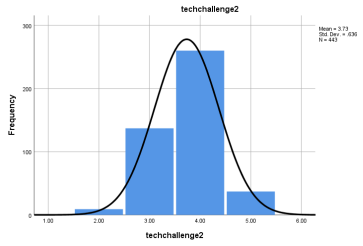


Technology usage

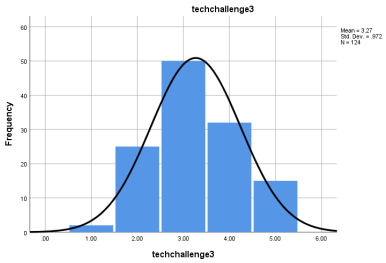


Network failure

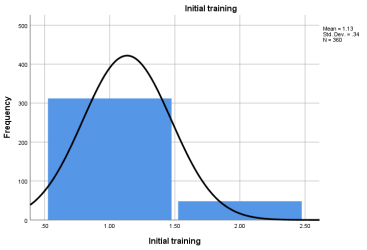
Histograms



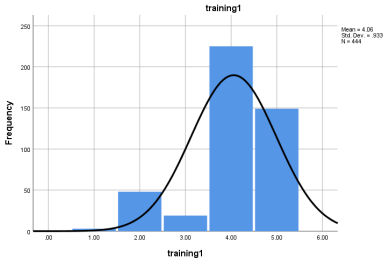
Phone problems



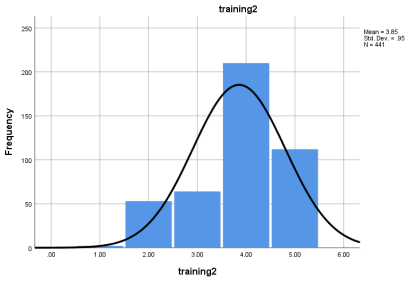
POS problems



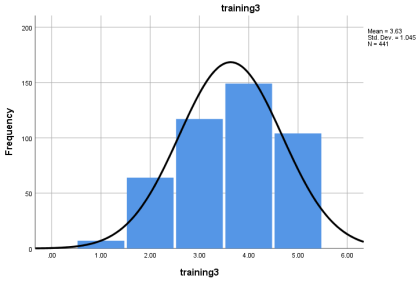
Initial training



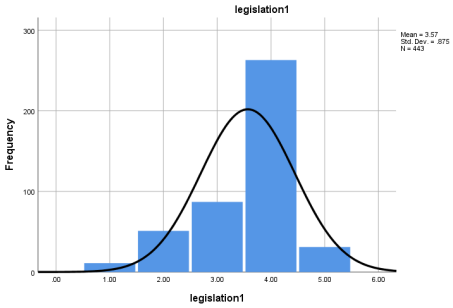
Counterfeit ID



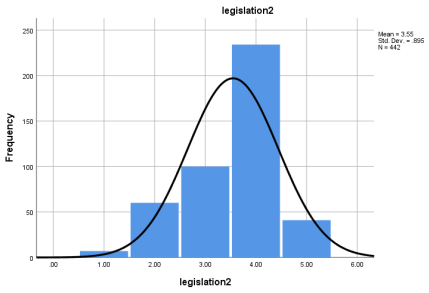
Follow-up training



Sufficiency of training

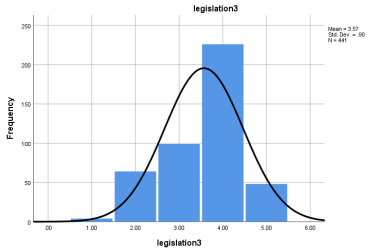


Know Your Customer

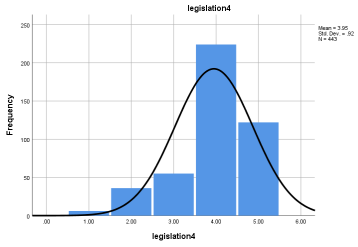


Anti-money laundering

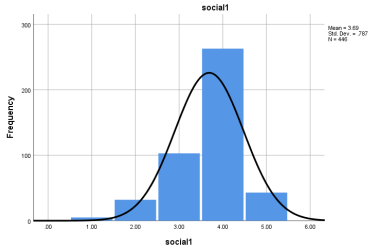
Histogram



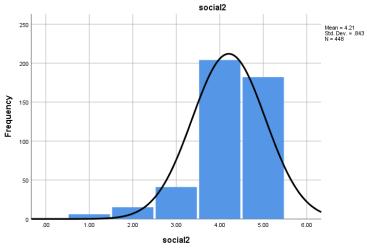
Suspicious Transaction



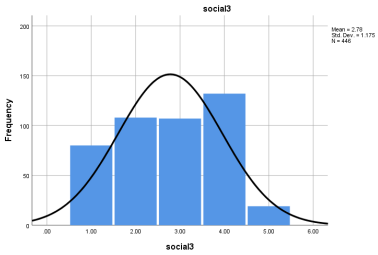
Customer privacy



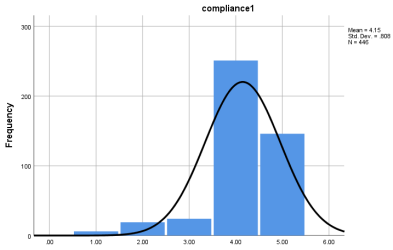
Agent-customer trust



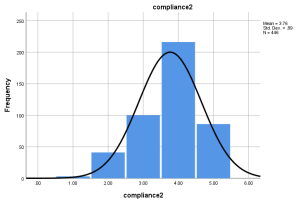
Loyalty to agent



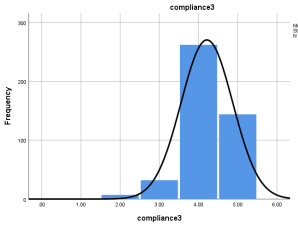
Loyalty to customer



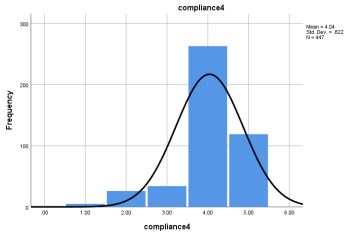
Know your customer



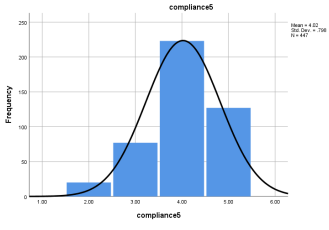
Liquidity



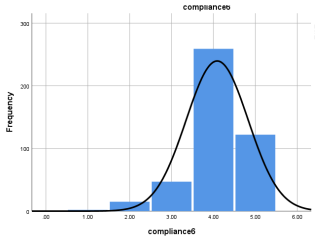
Fees Schedule



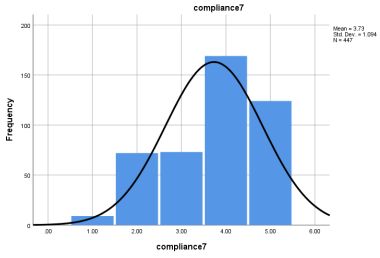
Hotlines



Complaint Handling

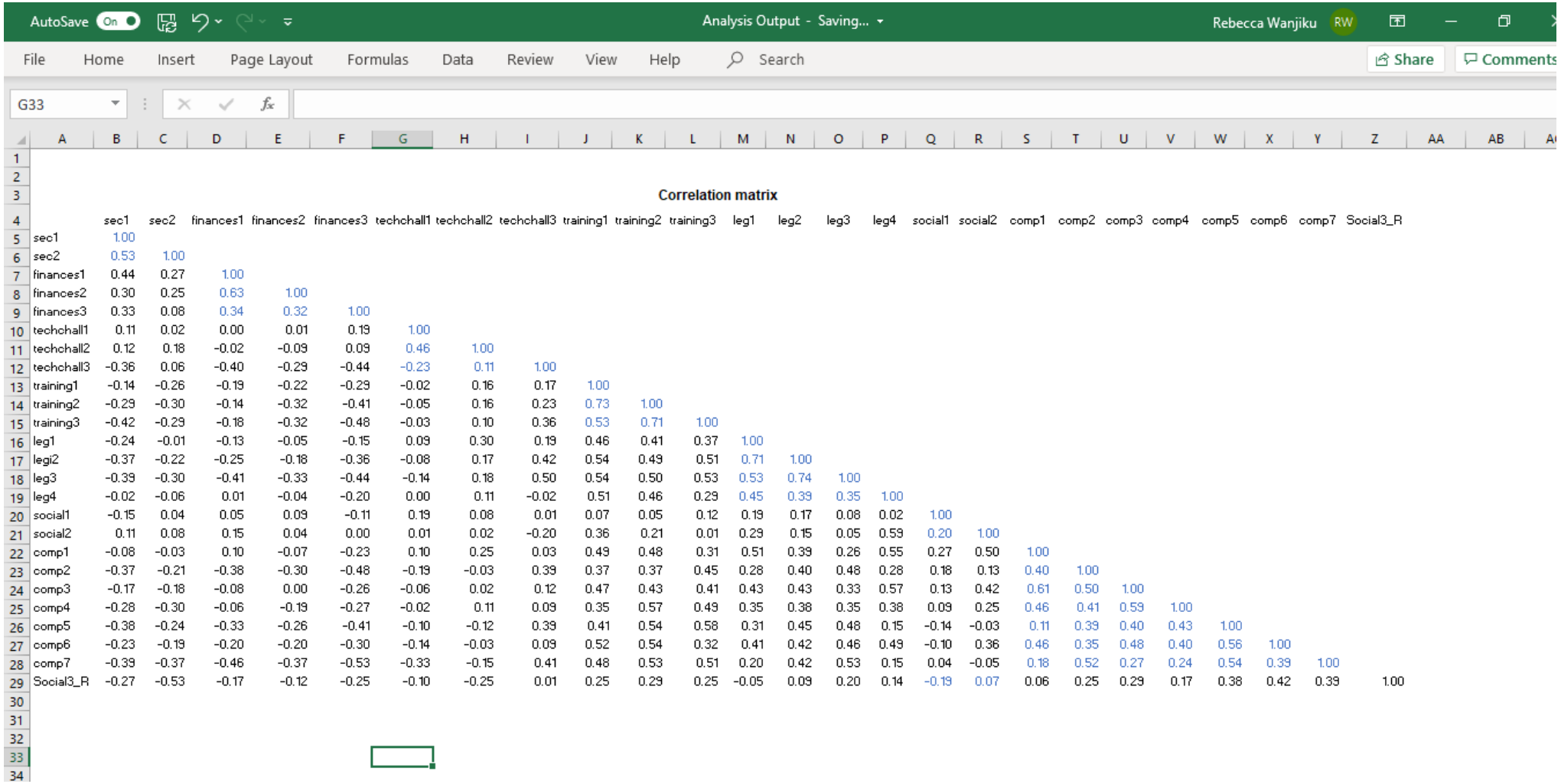


Incident Reporting



Agent manuals

Appendix C: Correlation Matrix



Correlation matrix

	sec1	sec2	finances1	finances2	finances3	techchall1	techchall2	techchall3	training1	training2	training3	leg1	leg2	leg3	leg4	social1	social2	comp1	comp2	comp3	comp4	comp5	comp6	comp7	Social3_R
sec1	1.00																								
sec2	0.53	1.00																							
finances1	0.44	0.27	1.00																						
finances2	0.30	0.25	0.63	1.00																					
finances3	0.33	0.08	0.34	0.32	1.00																				
techchall1	0.11	0.02	0.00	0.01	0.19	1.00																			
techchall2	0.12	0.18	-0.02	-0.09	0.09	0.46	1.00																		
techchall3	-0.36	0.06	-0.40	-0.29	-0.44	-0.23	0.11	1.00																	
training1	-0.14	-0.26	-0.19	-0.22	-0.29	-0.02	0.16	0.17	1.00																
training2	-0.29	-0.30	-0.14	-0.32	-0.41	-0.05	0.16	0.23	0.73	1.00															
training3	-0.42	-0.29	-0.18	-0.32	-0.48	-0.03	0.10	0.36	0.53	0.71	1.00														
leg1	-0.24	-0.01	-0.13	-0.05	-0.15	0.09	0.30	0.19	0.46	0.41	0.37	1.00													
legi2	-0.37	-0.22	-0.25	-0.18	-0.36	-0.08	0.17	0.42	0.54	0.49	0.51	0.71	1.00												
leg3	-0.39	-0.30	-0.41	-0.33	-0.44	-0.14	0.18	0.50	0.54	0.50	0.53	0.53	0.74	1.00											
leg4	-0.02	-0.06	0.01	-0.04	-0.20	0.00	0.11	-0.02	0.51	0.46	0.29	0.45	0.39	0.35	1.00										
social1	-0.15	0.04	0.05	0.09	-0.11	0.19	0.08	0.01	0.07	0.05	0.12	0.19	0.17	0.08	0.02	1.00									
social2	0.11	0.08	0.15	0.04	0.00	0.01	0.02	-0.20	0.36	0.21	0.01	0.29	0.15	0.05	0.59	0.20	1.00								
comp1	-0.08	-0.03	0.10	-0.07	-0.23	0.10	0.25	0.03	0.49	0.48	0.31	0.51	0.39	0.26	0.55	0.27	0.50	1.00							
comp2	-0.37	-0.21	-0.38	-0.30	-0.48	-0.19	-0.03	0.39	0.37	0.37	0.45	0.28	0.40	0.48	0.28	0.18	0.13	0.40	1.00						
comp3	-0.17	-0.18	-0.08	0.00	-0.26	-0.06	0.02	0.12	0.47	0.43	0.41	0.43	0.43	0.33	0.57	0.13	0.42	0.61	0.50	1.00					
comp4	-0.28	-0.30	-0.06	-0.19	-0.27	-0.02	0.11	0.09	0.35	0.57	0.49	0.35	0.38	0.35	0.38	0.09	0.25	0.46	0.41	0.59	1.00				
comp5	-0.38	-0.24	-0.33	-0.26	-0.41	-0.10	-0.12	0.39	0.41	0.54	0.58	0.31	0.45	0.48	0.15	-0.14	-0.03	0.11	0.39	0.40	0.43	1.00			
comp6	-0.23	-0.19	-0.20	-0.20	-0.30	-0.14	-0.03	0.09	0.52	0.54	0.32	0.41	0.42	0.46	0.49	-0.10	0.36	0.46	0.35	0.48	0.40	0.56	1.00		
comp7	-0.39	-0.37	-0.46	-0.37	-0.53	-0.33	-0.15	0.41	0.48	0.53	0.51	0.20	0.42	0.53	0.15	0.04	-0.05	0.18	0.52	0.27	0.24	0.54	0.39	1.00	
Social3_R	-0.27	-0.53	-0.17	-0.12	-0.25	-0.10	-0.25	0.01	0.25	0.29	0.25	-0.05	0.09	0.20	0.14	-0.19	0.07	0.06	0.25	0.29	0.17	0.38	0.42	0.39	1.00

Appendix D: PLS-SEM Settings

PLS Algorithm Calculation Settings

Data file Settings	
Data file	Raw Data - Copy3 [450 records]
Missing value marker	none
Data Setup Settings	
Algorithm to handle missing data	Casewise Deletion
Weighting Vector	-
PLS Algorithm Settings	
Data metric	Mean 0, Var 1
Initial Weights	1.0
Max. number of iterations	300
Stop criterion	7
Use Lohmoeller settings?	No
Weighting scheme	Path
Construct Outer Weighting Mode Settings	
Compliance	Automatic
Environment	Automatic
Strategy	Automatic
Structure	Automatic

Bootstrapping Settings

Data file Settings	
Data file	Raw Data - Copy3 [450 records]
Missing value marker	none
Data Setup Settings	
Algorithm to handle missing data	Casewise Deletion
Weighting Vector	-
PLS Algorithm Settings	
Data metric	Mean 0, Var 1
Initial Weights	1.0
Max. number of iterations	300
Stop criterion	7
Use Lohmoeller settings?	No
Weighting scheme	Path
Bootstrapping Settings	
Complexity	Basic Bootstrapping
Confidence interval method	Bias-Corrected and Accelerated (BCa) Bootstrap
Parallel processing	Yes
Samples	500
Significance level	0.05
Test type	Two Tailed
Construct Outer Weighting Mode Settings	
Compliance	Automatic
Environment	Automatic
Strategy	Automatic
Structure	Automatic

Blindfolding Settings

Data file Settings	
Data file	Raw Data - Copy3 [450 records]
Missing value marker	none
Data Setup Settings	
Algorithm to handle missing data	Casewise Deletion
Weighting Vector	-
PLS Algorithm Settings	
Data metric	Mean 0, Var 1
Initial Weights	1.0
Max. number of iterations	300
Stop criterion	7
Use Lohmoeller settings?	No
Weighting scheme	Path
Blindfolding settings	
Omission distance	7
Construct Outer Weighting Mode Settings	
Compliance	Automatic
Environment	Automatic
Strategy	Automatic
Structure	Automatic

PLS Predict Settings

Data file Settings	
Data file	Raw Data - Copy3 [450 records]
Missing value marker	none
Data Setup Settings	
Algorithm to handle missing data	Casewise Deletion
Weighting Vector	-
PLS Algorithm Settings	
Data metric	Mean 0, Var 1
Initial Weights	1.0
Max. number of iterations	300
Stop criterion	7
Use Lohmoeller settings?	No
Weighting scheme	Path
PLS Predict Settings	
No. of Repetitions	10
Number of Folds	10
Construct Outer Weighting Mode Settings	
Compliance	Automatic
Environment	Automatic
Strategy	Automatic
Structure	Automatic

Appendix E: Research Licence

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR
SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 125495

Date of Issue: 24/October/2019

RESEARCH LICENSE

This is to Certify that Ms.. Rebecca Njuguna of University of Cape Town, has been licensed to conduct research in Kisumu, Meru, Mombasa, Nairobi, Nakuru, Uasin-Gishu on the topic. Examining Compliance of Digital Financial Service Agents with Legislation and Standards in Kenya for the period ending : 24/October/2020.

License No: **NACOSTI/P/19/1760**

Signature Removed

125495

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR
SCIENCE,TECHNOLOGY &
INNOVATION

Verification QR Code

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Appendix F: UCT Faculty of Commerce Ethics Approval

Faculty of Commerce
Private Bag X3, Rondebosch, 7701
2.26 Leslie Commerce Building, Upper Campus
Tel: +27 (0) 21 650 4375/ 5748 Fax: +27 (0) 21 650 4369
E-mail: com-faculty@uct.ac.za
Internet: www.uct.ac.za
@Commerce UCT UCT Commerce Faculty Office

13th November 2019

Ms Rebecca Njuguna
Department of Information Systems
University of Cape Town

Dear Ms Njuguna

REF: REC 2019/10/066

EXAMINING COMPLIANCE OF DIGITAL FINANCIAL SERVICE AGENTS WITH LEGISLATION AND STANDARDS IN KENYA

We are pleased to inform you that your ethics application has been approved. Unless otherwise specified this ethical clearance is valid for 1 year and may be renewed upon application.

Please be aware that you need to notify the Ethics Committee immediately should any aspect of your study regarding the engagement with participants as approved in this application, change. This may include aspects such as changes to the research design, questionnaires, or choice of participants.

The ongoing ethical conduct throughout the duration of the study remains the responsibility of the principal investigator.

We wish you well for your research.

Shandre Swain
Administrative Assistant
University of Cape Town
Commerce Faculty Office
Room 2.26 | Leslie Commerce Building

Office Telephone: +27 (0)21 650 2695 / 4375
Office Fax: +27 (0)21 650 4369
E-mail: sl.swain@uct.ac.za
Website: www.commerce.uct.ac.za<http://www.commerce.uct.ac.za/

Appendix G: Letter of Introduction to Participants

Questionnaire Introductory Letter

Department of Information Systems
Leslie Commerce Building, Upper Campus
University of Cape Town
Private Bag X3, Rondebosch 7701
Tel. +27(0)21 - 650 2261
https://www.commerce.uct.ac.za/InformationSystems/

Re: Questionnaire Introductory Letter

Dear Sir/Madam,

I am a full-time student at the University of Cape Town (UCT) South Africa. As a requirement for my Masters degree, I am conducting a study by the title **"Examining Compliance of Digital Financial Service Agents with Legislation and Standards in Kenya**." I have been given a permit by the National Commission for Science, Technology and Innovation (NACOSTI) in Kenya and ethical clearance by the UCT Faculty of Commerce Ethics Board respectively to collect data.

The objectives of this study is to *identify the most important factors affecting agents in their operations and how those factors affect agents' compliance with relevant legislation and standards*. Your participation is entirely voluntary, and you will be free to withdraw at any point should you not feel comfortable participating in the study. There is no information that can identify you or your business will be requested for in the questionnaire. All the data collected will only be used for academic purposes and findings will be presented to the University of Cape Town as part of the completed dissertation. The questionnaire requires approximately ten (10) minutes to complete.

If you have any further questions you can contact me through +254 728933911.

Your participation is highly appreciated. Thank you.

Rebecca Njuguna
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Department of Information Systems
University of Cape Town
Contact: njuguna.rebecca@gmail.com

Dr Adheesh Budree
Research Supervisor
Department of Information Systems
University of Cape Town
Contact: adheesh.budree@uct.ac.za

Appendix H: Questionnaire

Questionnaire

Section 1: Demographics

Please tick where appropriate:

1. Gender: Male ☐ Female ☐ Prefer not to answer ☐
2. Age: 18-30 ☐ 31-40 ☐ 41-50 ☐ Above 50 ☐

Section 2: Structure

Part A: Human Resources

1. Employment Status: Business owner ☐ Employee ☐
2. Level of Education:

Primary ☐ Secondary ☐ College (Certificate) ☐

College (Diploma) ☐ Bachelor's Degree ☐ Masters/PhD ☐

3. Is this your first job? Yes ☐ No ☐
4. If you answered **No** above, please state your previous job title

   .....

Part B: Business Environment

1. Do you have another business on this shop apart from agency services?
   Yes ☐ No ☐
2. If you answered **Yes** above, please state the type of business e.g. electronics, pharmacy.....
3. If you answered **Yes** above, how long has the business been in operation?

1 year or less ☐ 2-4 years ☐ 5-7 years ☐ 8-10 years ☐ More than 10 years ☐

4. How long have you been offering agency services?

1 year or less ☐ 2-4 years ☐ 5-7 years ☐ 8-10 years ☐ More than 10 years ☐

5. Do you offer agency services for more than one institution?
   Yes ☐ No ☐
6. Please list the agency services you offer e.g. Mpesa, Equity

   1. 3. 5.

   2. 4. 6.

7. To what extent do you agree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I have fears of robbery because of my business location					
My customers are concerned about their safety when transacting here					

Part C: Financial Resources

1. What is the approximate float (Ksh.) for your agency business?
   Below 10k ☐ 10-20k ☐ 20-50k ☐ 50-100k ☐ Above 100k ☐
2. What is the approximate agency commission (Ksh.) you receive for agency services?
   Below 10k ☐ 10-20k ☐ 20-50k ☐ 50-100k ☐ Above 100k ☐
3. To what extent do you agree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I often lack cash or float for withdrawals and deposits					
Sometimes I use cash from other businesses to buy float or for customers withdrawals					
The agent commission from telecoms and banks is enough to cover all agency costs and make a profit					

Section 3: Strategy

Part A: Technology

1. Which of these technologies do you use for agency services? (Tick all that apply)

Mobile phone ☐ Point-of-Sale (POS) ☐ Cash counting machine ☐

CCTV cameras ☐ UV light bulb to check fake notes ☐

2. How often do you experience challenges related to the following technologies?

	Always	Often	Sometimes	Rarely	Never
Network failure					
Mobile phone					
POS device					

Part B: Training

1. Did you receive training when you started working as an agent? Yes ☐ No ☐
2. To what extent do you agree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I have been trained to recognize fake customer IDs and fake notes					
Banks/telecoms provide refresher training when there are new products or changes in the system					
Training provided by banks/telecoms is enough					

Section 4: Environment

Part A: Legislation Awareness

1. To what extent do you agree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I know Customer Due Diligence (CDD) and Know Your Customer (KYC) regulations and procedures					
I know Anti-money Laundering (AML) regulations and procedures					
I know Suspicious Transaction Reporting (STR) regulations and procedures					
I know the standards for customer information privacy and confidentiality					

Part B: Sociological factors

1. To what extent do you agree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I trust my customers					
I have customers who come regularly because they trust me					
If I have cash or float shortage, I would prefer to serve my regular customers than strangers					

Section 5: Compliance

1. To what extent do you agree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I always insist to see a customer's original ID					
I always have enough cash/float to serve customers					
I have the current transaction fee schedule displayed at a place visible to customers					
Bank/telecom customer care numbers that customers can call for complaints are displayed at a place visible to customers					
I immediately forward customer complaints or issues that I am not able to handle to the bank/telecom					
I report any incidents of fraud, theft or robbery that occurs in my agency services					
I have agent manuals from banks/telecoms that describe policies and guidelines for safe and quality customer service					

Thank you very much for your time.

Appendix I: Plagiarism report

njgreb001:Dissertation_Draft_3_24_Aug.docx

ORIGINALITY REPORT

1%	1%	0%	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

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