

# An investigation into the Policy and Regulatory Challenges of Digital Financial Services ICT infrastructure in Zambia

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## Abstract

Digital Financial services (DFS) regulations including that of mobile money services have been discussed at length in Sub-Saharan region as the answer to financially include the poor and providing access to affordable financial services. Because of their cheaper set up costs than traditional Brick and Mortar banking services, Africa is thriving at these initiatives as it benefits the underserved. This research, explores the challenges of the Policies and regulations of digital financial services on Zambia's ICT infrastructure and brings out the inadequacies of the current Banking and Telecommunications frameworks. The research further compares Zambia's regulatory challenges with similar World Bank findex ranked developing countries around the globe. The discussion focuses on the merits of overlapping jurisdictions of the Banking and Telecommunications regulations to allow for enabling ICT infrastructure and how it can improve the overall underlying financial landscape and the financial inclusion ecosystem for the unbanked. Based on the research results, the paper concludes by comparing the financial risks thresholds and the tiered bands of regulation which are directly proportional and leads to increase in financial inclusion and bringing about the convergence of traditional financial services and mobile financial services (MFS). The paper further provides recommendations on the need for an enabling, interoperable and harmonized set of policies and regulation to avoid restrictive regulations and allow for innovation in this space for the successful implementation of DFS in Zambia.

**Keywords:** *Digital Financial Services, Regulatory challenges, ICT Infrastructure, Mobile Money, Financial Inclusion*

## 1. Introduction

Economists estimate that only 8% of the world's money currently exists as physical cash, the other 92% is in the form of digital money. [1] This means that, most of the world's transactions are based on the 92% of the digital money. Digital Payments are exchanged digitally using technologies which depend on Telecommunications

infrastructure, Public and Private internet and intranets which have to be regulated to allow for Improved competition, improved Quality of Service (QOS), Increased investment, greater economic growth, Consumer Protection and financial Inclusion. Before the advent of DFS, Central Banks printed Banknotes according to how much gold or silver they held in their reserves in the vaults. In sub Saharan Africa and Zambia in particular, DFS are now most prevalent on mobile platforms and have allowed access to financial services for the unbanked poor people who do not have access to the traditional "Brick and Motor" model of banking where there is a lot of costs associated with setting up and maintaining remote financial institutions in remote areas. According to the world Bank global findex survey of 2017, there has been an 11% increase from 2011 to 2017 of Zambians paying for services such as utility bills or school fees using mobile money [2] The findex survey shows that DFS has improved lives in Zambia and will continue only if we understand and address the challenges of overlapping Jurisdictions, Policy, Rules and Regulations. This study will Investigate the Policy and Regulatory challenges of DFS ICT Infrastructure in Zambia and compared the Central Bank, Competition and Consumer Protection Commission and the Telecommunications authority regulations in the country.

## Zambia's ICT Financial Infrastructure

Zambia's Digital financial services infrastructure landscape consists of the combination of the underlying Telecommunications infrastructure on which mobile financial services operate, Public and Private internet and intranets. There are different platforms of the Payments Systems available for transaction between and among end users, including consumers, merchants, businesses and governments. These payments systems may be public, semi-public, or private and they may be "closed-loop" or "open-loop". There is a certain degree of payments system interoperability among participants in payments and this is a necessary component of infrastructure readiness. The voice and data Communication Networks that support

financial messaging among end users and providers require a certain levels of communication network quality and security that are a necessary component of infrastructure readiness and calls for regulation to allow for consistency and reliable transactions.

### 1.1 Problem Statement

Despite the improved use of DFS in Zambia, there is still a lot to be done in order to further improve lives of the poor. We do not know how regulatory enablers allow for the continued DFS growth and hence the need to understand and address the challenges of overlapping Jurisdictions, Policy, Rules and Regulations. The study will compare Zambia with the regulatory challenges in other World Bank findex ranked developing countries around the world. There is converging services in these countries as shown in figure 1. This is a summary of converging services of banking digital financial solutions and Mobile financial solutions from developing countries in Africa, Asia and Latin America.

These converging services are prevalent in Zambia and calls for regulation of both the mobile financial services

and digital financial services. For the digital financial services businesses to achieve their strategic goals earlier as can be seen from the digital financial Ecosystem and its components in figure 2 below. The actors and services that constitute DFS Ecosystem depends on two fundamental support structures that include an enabling regulatory environment and a solid level of infrastructure readiness.

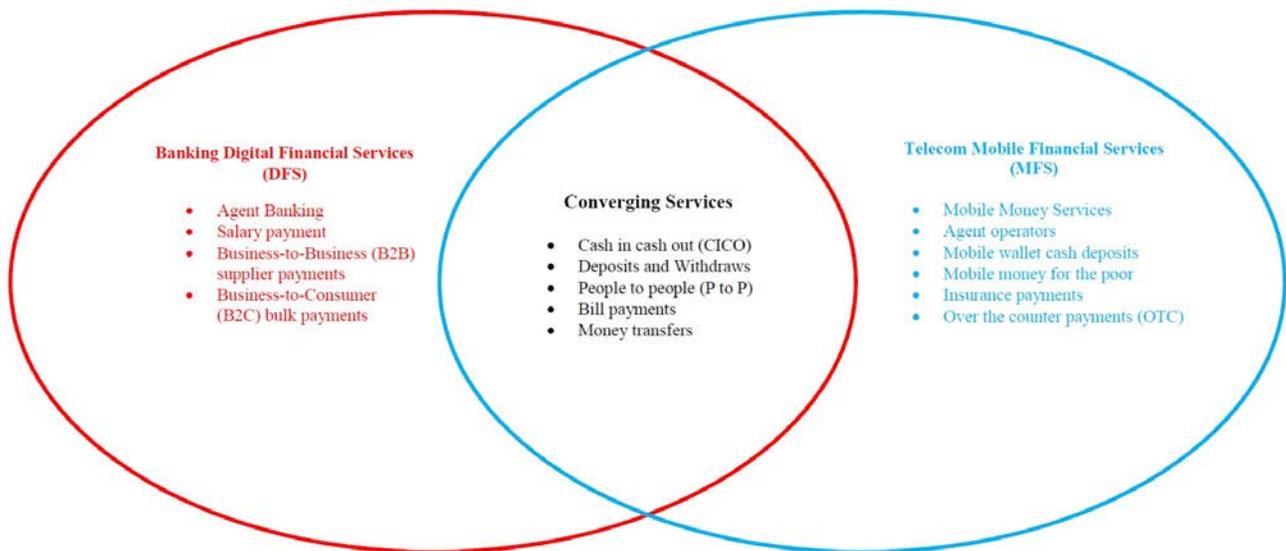
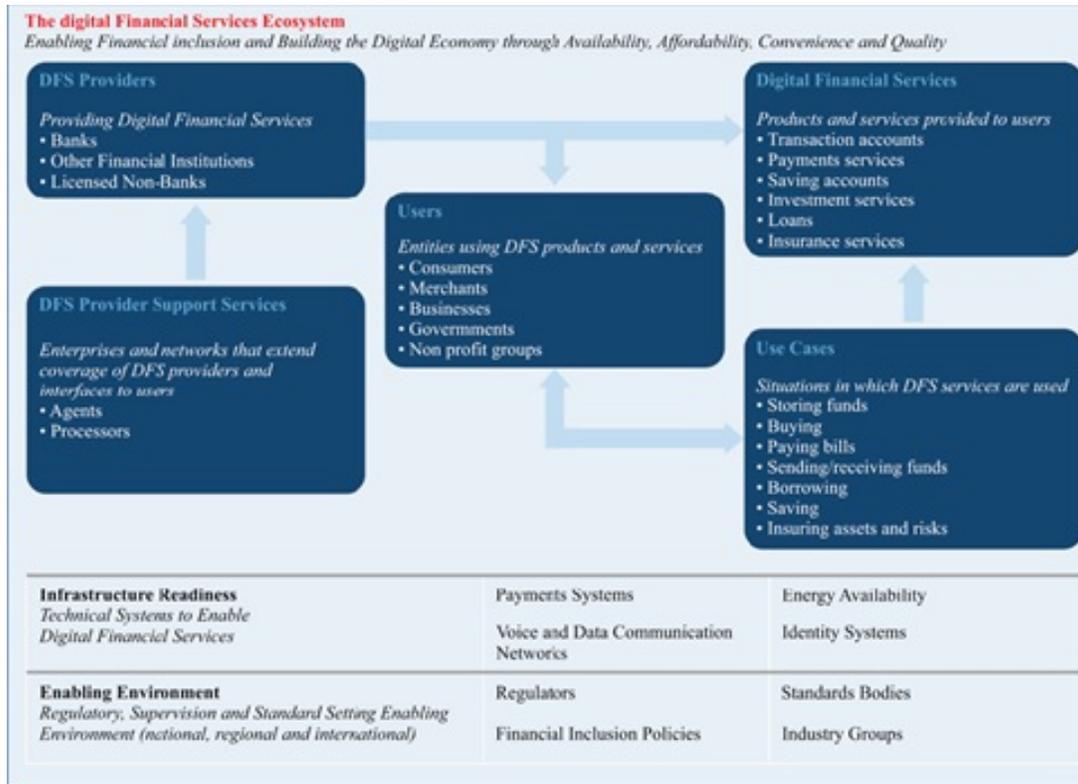


Figure 1: DFS Converging Services



**Figure 2:** The Digital Financial services Ecosystem (Source: Digital Frontiers Institute)

## 1.2 Research Objectives

The main objectives were designed to compare the regulatory challenges of digital financial services and the regulatory enablers in developing countries similar to Zambia and included the following:

- I. To Investigate if there is any collaboration and corporation between financial institutions regulators and the Telecommunications regulators in Zambia.
- II. To evaluate the impacts of the financial Risk thresh holds on the current regulation of DFS and financial inclusion.
- III. To identify regulatory blockers to DFS and identify the regulatory rules or Policies that cause barriers to innovation or adoption of Regtechq for financial services?

## 1.3 Research Questions and Hypothesis

- I. How do we overcome the blockers of policy, rules and regulatory challenges of DFS ICT Infrastructure in Zambia?

- II. What collaboration and corporation is currently between financial institutions regulators and the Telecommunications regulators?
- III. How much more collaboration, harmonization and corporation need to be established in order for DFS to further impact lives of the poor in Zambia?
- IV. Are the current Zambian laws on Digital Payment systems and the ICT infrastructure enough to allow DFS to thrive in Zambia?
- V. What other players in the DFS ecosystem can positively impact on the Regulations, policy and rules of Digital financial services?

## 2. Literature Review

According to World Bank and G20's Global Partnership for Financial Inclusion (GPII), 2.5 billion people worldwide remain excluded from access to financial services. [3]. The World Bank further views financial inclusion as an enabler, and not just a primary goal, in the

UN sustainable development goals which define the global development agenda through 2030. The G20 GPMI came up with practical recommendations for financial services regulators and policymakers worldwide. Credit Histories from DFS electronic payments create records, allowing transaction histories that can support borrowing by poor consumers and merchants.

GSMA Association recommends the regulation of Mobile Money services as the alternative to saving the poor and the Unbanked [4]. The ITU Policy and regulation refers to the regulatory framework within a country that governs the delivery of DFS and involves several different aspects such as provision of financial services to the poor. Most Global organizations such as the World Bank through the G20, ITU and GSMA association recommends for DFS providers to continue offering valuable services that contribute to financial inclusion.

The research reviewed studies on DFS regulatory challenges in developing countries similar to Zambia. We compared regulatory challenges in comparable World Bank index ranked developing countries around the globe including the following:

### 2.1 South Asia and Latin America

A study conducted by Deloitte on the Digital revolution in India shows that the India Stack and Aadhaar digital biometric identification programs are being championed by the government and ICT financial systems regulators to promote a country wide digital financial service. [5]. India had their fair challenges of Digital Financial System's ICT infrastructure as highlighted by MD. Shakir Ali, MD. Wasim Akhtar and K. Safiuddin in their publication the Digital Payments for Rural India - Challenges and Opportunities of June 2017. As a continuation of policy evolution of telecom within the country and the international arena in the context of Millennium Development Goals, a National Optical Fibre Network (NOFN) was being implemented, largely by the public sector organizations using the universal service obligation fund. The NOFN will be connecting 250,000 gram panchayats, a local administrative region for group of villages and aims to deliver ICT based goods and services to the rural households in partnership with private service providers by December 2012. The pilot implementation of the project was able to connect only the government offices, and private service players are yet to actively participate.

We also compared Zambia to a study that looks at Pakistan's nearly decade old experience with regulating digital financial services. It is referred to in the local context as branchless banking and constitutes of Institutions providing microfinance services in Pakistan

including microfinance banks (MFBs), microfinance NGOs, and commercial banks, along with government-supported Rural Support Programs (RSPs). MFBs and commercial banks are regulated by the State Bank of Pakistan (SBP) Microfinance NGOs and RSPs, neither of which can accept deposits. [6]. They are registered by either the Securities and Exchange Commission of Pakistan or provincial authorities. Pakistan has a specialized law for MFBs, the Microfinance Institutions Ordinance, and prudential regulations for MFBs. There are also specific guidelines on Islamic microfinance issued by the SBP. A pilot Microfinance-Credit Information Bureau developed through a public-private partnership among the SBP, the microfinance industry and a private sector credit bureau was launched in May 2010 in Lahore. The Pakistan government also regulates the National Financial Switch which now provides the lowest ATM rates in the world enhancing the provision of DFS [7].

Still in Asia, a country report by better than cash alliance outlines that the government of Bangladesh implemented a nationwide mobile payments system in 2017 and it has rapidly grown the mobile payment services, transforming people's ability to save money securely and access it conveniently. This has made life better and business easier. The Bkash service in Bangladesh is an over-the-counter service, and agent liquidity is managed much more directly by the mobile operators themselves [8].

In Latin America, we compared Zambia with Peru which has implemented Modelo peru, a collaborative government effort to establish an inclusive nationwide digital payments platform, the first of its kind in the world and positively impacting day-to-day life of its citizens. It is a fully-interoperable and accessible mobile money platform [9]. Modelo Peru is a large, collaborative effort between the government and more than 30 financial service providers, telecommunication companies, and other stakeholders to create BIM, a fully-interoperable e-wallet that operates on any smart or feature phone across all mobile networks. Using an ecosystem approach, Peru has developed a mobile money infrastructure that has all players share a common brand, technology, agents and even contact centers.

### 2.2 Sub-Saharan Africa

In Sub Saharan Africa, we looked at a study in Ghana that revealed the Positive effects of DFS Mobile Money on national Payment Systems [10]. It further showed how enabling regulatory framework makes significant impact in the uptake and active usage of mobile money services and allows for buying treasury bills through mobile money, saving and buying insurance. The change in regulations

has contributed in turning Mobile Money around in Ghana in 3 short years.

Studies in Tanzania further affirmed that government-driven approaches has fostered private DFS innovation due to open regulation [11]. The service is interoperability and has made a difference to a market that has almost become saturated from a growth perspective.

We continued with our African tour and compared to Kenya, the poster country for Mobile financial services on the globe. Kenya, offers lessons to policy makers on both the conditions and policies that have allowed for an innovative ICT-based financial service to scale, with positive effects on the rest of the financial services system. Several studies postulates that the Central Bank of Kenya (CBK) was willing to support a mobile money pilot and found a balance between regulations, oversight, and flexibility for the mobile operators to experiment and be allowed to fail or thrive which led to the success of the famous M-Pesa since its inception in 2007 [12].

After comparing Zambia with the regulatory challenges in the above outlined world Bank findex ranked developing countries around the world, we abridged the similar converging services in these countries. These converging services are prevalent in Zambia and includes banking digital financial solutions and Mobile financial solutions such as agent cash in cash outs (CICO), cash deposits, cash withdraws, person to person transactions, Bill payments and money transfers. These services further calls for regulation of both the mobile financial services and digital financial services (DFS). Because of this convergence,

convenience and ease of use, DFS are sometimes used for illegal and illicit activities such as Money Laundering and Financing of Terrorism activities. The Industry therefore, needs stringent Policy, Rules and Regulations to guide the use of digital financial services. Regulation is important to allow for a Fair playing field by the Incumbents, Improved competition and quality of service, Increased investment, greater economic growth, Improved efficiency, healthy competition, consumer Protection and overall financial Inclusion.

### 3. Methodology

The Research was conducted from the Financial Services Regulator, Telecommunications regulator and the competition and consumer protection commission. The research frame work used is as shown in figure 3 below:

**Figure 3:** Research Framework

Research Approach	➔	Quantitative/ qualitative
Research Design	➔	Mixed Method
Research Sites	➔	Financial Services and Telecommunications Regulators
Sampling procedure	➔	Selective Target
Data Collection Instruments	➔	Questionnaires and Focus Groups
Data analysis	➔	Descriptive Analysis

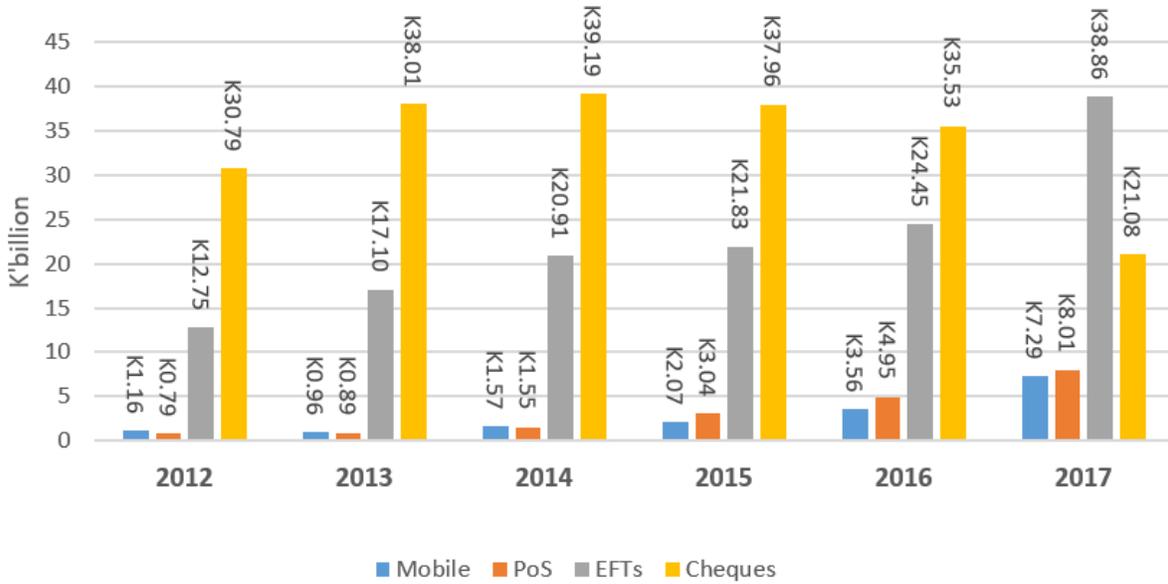


Figure 4: DFS Transaction Values 2012 – 2017

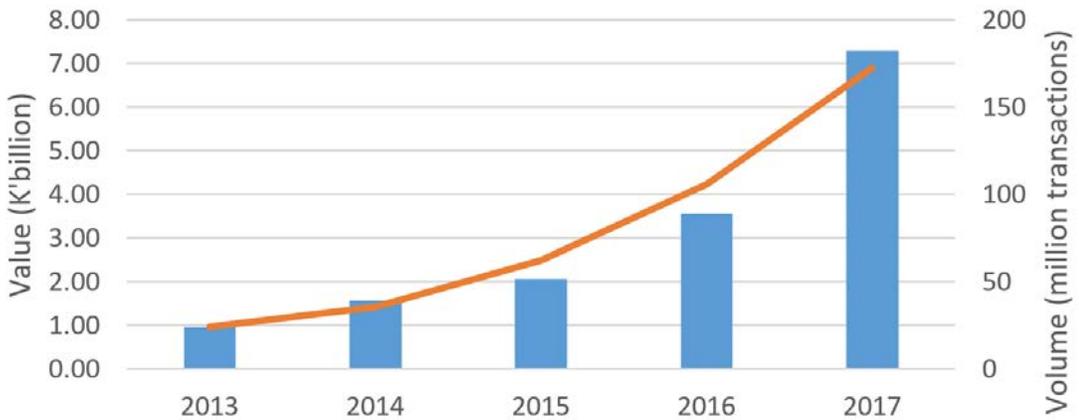


Figure 5: MFS Mobile payments 2013 - 2017

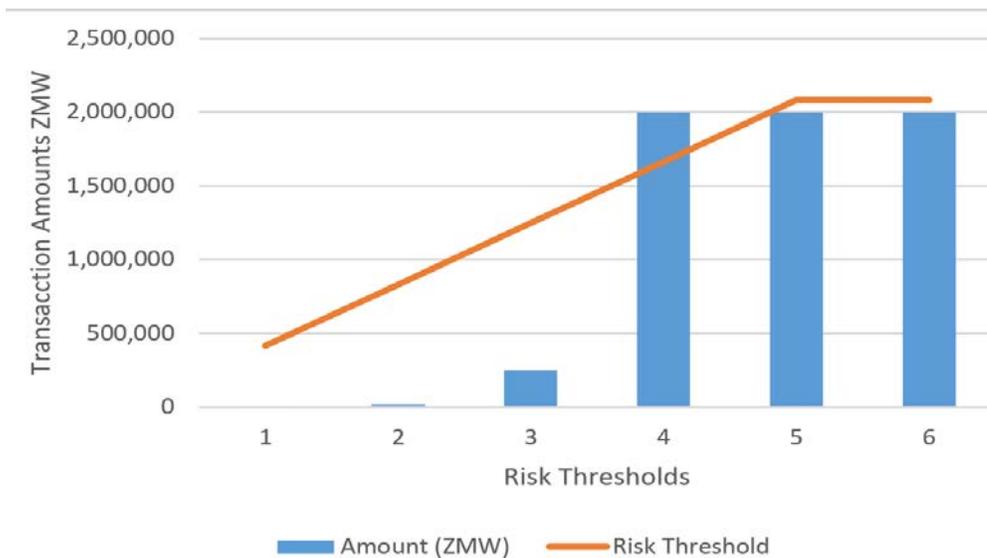


Figure 6: MFS Tiered regulation compared with Risk thresholds

### 3.1 Target Data

The research target data included the transaction values and volumes on Digital financial services from the year 2012 to 2017 as seen in figure 4 below and how the change in regulation affected the figures during this period. The target DFS services included Point of Sales (POS), Electronic funds Transfers (EFT's), Cheques and Mobile Money as the Mobile financial service. The POS volumes where K1,677,179 for 2012 and K12,193,059.6 for 2017 representing 86.24% increase over the 5-year period. The EFT volumes where K4,027,061 in 2012 and K5895397 in 2017 representing a 31.69% increase. The Cheques transaction volumes on the other hand were K2,800,759 in 2012 and K2,346,707 in 2017 depicting a -19.35% decrease. Mobile money transaction volumes where K17,430,411 in 2012 and K172,429,910.89 in 2017 representing 89.89% increase.

### 3.2 Sample Selection

The sample selected targeted transaction values and volumes for DFS. The sample also compared the transformation in regulation over a 5-year period and the financial risk thresholds compared with the tiered bands of transactional limits or amounts as shown in Table 2.

### 3.3 Data Analysis Tools

The data collected from the study was analyzed using Microsoft Power BI and Open Refine, an open source data analysis Package. Microsoft Power BI and Open refine Version 3.0 covered the above listed research objectives. (Refer to 1.2 Research Objectives).

## 4. Results and Analysis

The results compared the transaction values on mobile financial systems, point of sale, electronic funds transfer and cheques for a five year period. With the change in regulation in 2012, there was need to overcome challenges in mobile financial service regulations on ICT infrastructure, the transaction values on mobile platforms steadily increased from K1.16 to K7.29 billion representing a 84.03% increase over the 5-year period. Figure 3 below shows how the cheque which was the most used digital

financial service is decreasing from K30.79 in 2012 to 21.08 in 2017 showing a 46.07% decrease in cheques trasactions. The reduction in the use of cheques is due to the change in regulation to reduce the transaction item value limits (IVL) from K100,000 to K25,000 transaction limits [13]. The results show a reduced use of the cheques because of the regulation which continues to discourage the cheques because of their inefficiencies such as insufficiently funded

accounts where cheques bounce and inconveniaced the payee.

Figure 5 below also shows the steady increase in both the value and volumes of transactions on MFS due to enabling regulation and collaboration between the telecommunications regulator and the financial services regulator. Feedback from the questionnaires further shows that there is more collaboration, harmonization and corporation through a momeradum of understanding (MOU) between the two regulators. The volumes of Mobile transactions has soured from under K1 billion in 2013 to over K7 billion in 2017 and the progress continues to increase.

The research results also shows the relationships between the tiered approach to mobile financial services regulation and the transaction amounts where differend bands of transaction amounts are related to different Risk thresholds. The analysis shows that their is a lower risks on low value transactions under K10,000 as shown in Table 2. The low value transactions also have very basic requirements of only a national identity card such as passport, drivers license or NRC and have the highest transaction volumes because of their ease of used by many low income Zambians who constantly need to send and receive money for their day to day living.

As the Risk thresh hold increases, the transaction amounts also increases and the amount of regulatory requirements increases to a point where a full KYC in needed in order to mitigate the risks. The higher Tieres T3, T4 and T5 require more regulations and the requirements on the mobile financial platform start to converge and become similar to the requirements on digital financial services on a regular bank account. Financial institutions calculate the risks on transactions based on the Expected Monitory Value (EMV), which is the ballpark value showing how much money a plaintiff can expect in mediation . EMV is calculated by multipling the probability (likelywood) and the impact to get the overall ranking of the risks and shown in Eq (1) below.

$$EMV = Probabilty (likelywood) X Impact \quad (1)$$

Therefore, as the risk increases, the regulatory requirements became the same for both MFS and DFS. This convengency is dipected in Figure 6 where the risk increases with the transaction amounts and as the amounts continue to incese, the regulation requirements becomes a full know your customer requiremt which is the same for the mobile financial services and all other digital financial services.

After comparing Zambia with the other regulatory challenges in developing countries around the world, we

observed the converging services in these countries. These converging services are widespread in Zambia and calls for regulation of both the mobile financial services and digital financial services. Because of their convergence, convenience and ease of use, DFS are also used for illegal and illicit activities such as Money Laundering and Financing of Terrorism activities. The Industry therefore, needs rigorous Policy, Rules and Regulations to guide the use of digital financial services. Regulation is important to allow for a Fair playing field by the Incumbents, Improved competition and quality of service, Increased investment, greater economic growth, Improved efficiency, healthy competition, consumer Protection and overall financial Inclusion. Below are the current regulatory requirements for Digital financial services in Zambia.

**Table 1:** Requirements DFS and MFS (Source: Bank of Zambia)

Requirements to open a Digital Financial Services (DFS) Account	Requirements to open a Mobile Financial Service (MFS) Account (Mobile Money)
<ol style="list-style-type: none"> <li>Copy of your valid identity document (e.g. NRC or valid Passport).</li> <li>Proof of residence (e.g. utility bill)</li> <li>Two Passport size photos.</li> <li>Introductory letter from existing customers, employer, Minister of religion/Lawyer, Chief/Head man</li> </ol>	<ol style="list-style-type: none"> <li>Copy of your valid identity document (e.g. NRC or valid Passport) for Tire 1</li> <li>Additional documentation required for higher Tiers 2,3,4 and 5 depending on the transaction amounts involved.</li> </ol>

According to the Central Bank regulation of 2016, electronic money issuers are mandated to operate within the limits stipulated in the tiers as provided in the table below. The limit of transactions is placed in incremental tiers in order to manage and mitigate the associated risks. The KYC requirements for mobile financial services on mobile money increases with the increase in the transaction amounts as in table 2 below. As the amounts became high, the requirements amount to a full KYC (Know Your Customer) which is also the requirement of formal Bank accounts resulting in the convergence of the two services.

**Table 2:** Tiers and Risks of for Mobile financial services (MFS)

Tiered Categories	Transaction Limit (ZMW)	Risks for Mobile Financial Services Tiers
T1	10,000	<ol style="list-style-type: none"> <li>Sending money to the wrong mobile money account</li> <li>Agent pin code compromised (Social Engineering)</li> </ol>
T2	20,000	<ol style="list-style-type: none"> <li>Sending money to the wrong mobile money account</li> <li>Agent pin code compromised (Social Engineering)</li> <li>Deposit of counterfeit notes at the agent booths (Remote areas)</li> <li>Limited float of the agent depending on trust account balance</li> </ol>
T3 - Small Scale Farmers/Enterprises (Not Incorporated)	250,000	<ol style="list-style-type: none"> <li>Sending money to the wrong mobile money account</li> <li>Agent pin code compromised (Social Engineering)</li> <li>Deposit of counterfeit notes at the agent booths (Remote areas)</li> <li>Limited float of the agent depending on trust account balance</li> </ol>

T4 - Corporate	2,000,000	1 - 4. T1,T2,T3 5.Risks transferred and mitigated through insured transactions
T5 - Mobile Agents	2,000,000	Full KYC. Service provider is required to carry out a risk based customer due diligence.

The challenges and dilemma of DFS are experienced by both financial systems regulator and Telecommunications regulator. The challenges are at all stages of regulation including Enablement, Efficiency, Competition, consumer protection and financial inclusion stages of regulation. Below is a comparison of challenges between Mobile financial services (MFS) and Regular Digital financial services (DFS).

**Table 3:** Challenges of DFS and MFS (Source: Bank of Zambia)

Challenges on Digital financial services Accounts	Challenges on Mobile Financial Services Accounts
<ul style="list-style-type: none"> <li>Basic education and ability to read and write is required to use the services</li> <li>An electronic smart device or computer is needed to use the service</li> <li>The cost of the smart device or Computer</li> <li>Cyber-attacks on digital platforms</li> <li>Too many requirements reducing Customers uptake and slow on-boarding process</li> </ul>	<ul style="list-style-type: none"> <li>Full KYC documentation is required for customer on-boarding</li> <li>Counterfeit notes deposited at remote Mobile Money Booths,</li> <li>Cyber attackers on mobile money platform</li> <li>Need to constantly educate and sensitize Agents on counterfeits</li> <li>Tired requirements for Customer on-boarding depending on transaction accounts</li> </ul>

The results also showed how Zambia and compared with similar economies on the increase in openness to innovation and how it increases in the degree of certainty in the regulatory frame works. The economies with an open regulatory index and high certainty have their mobile financial services thriving. Figure 3 below compares the regulatory index certainty and the regulatory index openness.

## 5. Findings and Discussions

The surge in mobile technology has presented an opportunity for operational efficiency for mobile financial services. From the findings, the mobile money values have increased from K 1,163,628,529.09 transacted in 2012 to K 7,287,745,101.44 transacted in 2017 which translates into an impressive 84.03 % growth in the last five years as shown in table 4. Mobile money platforms in Zambia have continued to evolve as they continue being innovative and are incorporating other value added services such as providing for insurance schemes, paying for school fees, issuing out loans with amounts based on transactions on the mobile account, loans, payment of utility Bills, cash-In, Cash-Outs and purchase of Airtime. All these transactions on the mobile platforms are being performed using basic

2G phones using USSD (Unstructured Supplementary Service Data) or Smart phones using internet connectivity.

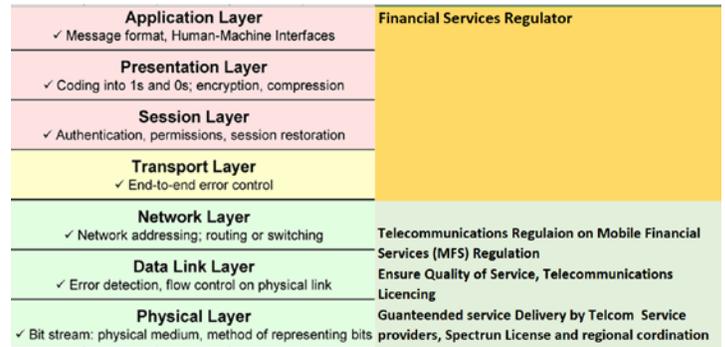
**Table 4:** Growth in MFS 2012 - 2017

Year	Mobile Values	% Change
2012	1,163,628,529.01	
2013	957,288,216.42	-21.55
2014	1,574,394,938.15	26.09
2015	2,069,611,070.71	43.78
2016	3,561,121,959.25	67.32
2017	7,287,745,101.44	84.03

The mobile channels have permitted for mass adoption of Financial Services because Banks do not roll out their branch and ATM networks to serve lower income customers in the remote branches. Mobile channels have succeeded because they are accessible from anywhere and anytime making account opening easy. They depend on telecommunications infrastructure which is available even in remote areas. Financial access through the mobile is delivered off the back of largely existing infrastructure and hence at a lower cost than traditional Banking.

The results also show that mobile financial services have also improved lives in Zambia and will continue only if we understand and address the challenges of overlapping Jurisdictions, Policy, Rules and Regulations. These new, vulnerable consumers need to feel a greater sense of control, to build up enough trust in these Digital Financial services, to be able to confidently become more active without fear of harm. Consumer protection is very important for DFS as it is a set of principles and guidelines which, when implemented appropriately, can not only protect these new digital financial services customers from harm, but will also the increase the Average revenue per user (ARPU). The customer activity rates will continue to increase as can be seen in figure 3 above.

Taking into consideration the open systems Interconnections (OSI) 7-layer conceptual model which standardizes the communications functions. The regulation of DFS is spread on the traditional OSI model with the mobile services regulator regulating the lower layers of the model and the financial services regulator regulating the upper layer services of the model as depicted in figure 7 below.



**Figure 7:** OSI Model and Regulation

## 6. Summary, Conclusion and Recommendations

Based on the research findings on the regulatory challengers of DFS and summarized according to the Zambian context. This paper gives details on the current regulatory status in the country with reference to the various literature of similar developing countries. The study opens an insight and highlights the current state of digital financial services in Zambia and therefore, concludes that the country needs enabling and strong Policies, and Regulations to guide the use of DFS for improved products, improved quality of service QOS, Increased investment, greater economic growth and Improve the lives of Zambian citizens. The study also outlines the challenges of limited collaboration between financial services regulator and Telecommunications regulators which is only through a memorandum of understanding (MOU) between the regulatory Authorities in Zambia. The authorities further need to formally outline joint goals and methods of working together, and outline considerations for coming up with combined laws and legislations which cuts across both mobile and digital financial services.

Currently, the Central Bank of Zambia regulates mobile money vehicles which are subsidiaries of main Telecommunications Companies which operate as independent financial institutions separate from the mother telecommunications company. The central Bank of Zambia overseas and regulates these units and all other digital payment systems in the country. Mobile money companies are required to hold Mobile money trusted accounts at a registered commercial Bank which facilitates the mobile to Bank transactions. In summary, the research established that the basic regulatory enablers that have produced positive results have adapted the Watch and learn approach compared to the wait and see approach which we recommend Zambia’s regulators should adopt.

Below is the summary list of regulatory enablers which will allow for Digital financial services to succeed: Financial services regulator, Telecommunications regulator and the consumer protection to came up with the working group that will work towards the implementation of a combined regulation and we recommend the implementation of the following:

1. There is a strong need to allow for Non-Banks electronic money issuance.
2. To allow the use of interoperable financial Agents.
3. We strongly recommend for Risk Based customer due diligence and approach to regulation.
4. To allow for a healthy competition and Consumer protection programs for increased customer uptake on mobile money solutions.
5. We recommend the adoption of the Watch and learn approach and not the Wait and see (Sand Box approach) model of regulations.
6. To focus on Regulation that minimize Digital Financial Services Risks.
7. To encourage the use of shared infrastructure by mobile telecommunications operators and agents to support multiple platforms.

## 7. Acknowledgments

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