UNIVERSITY OF CAPE COAST

DIGITAL FINANCIAL SERVICES AND WOMEN ECONOMIC EMPOWERMENT IN GHANA

LINDA KORKOR APPEYNARH

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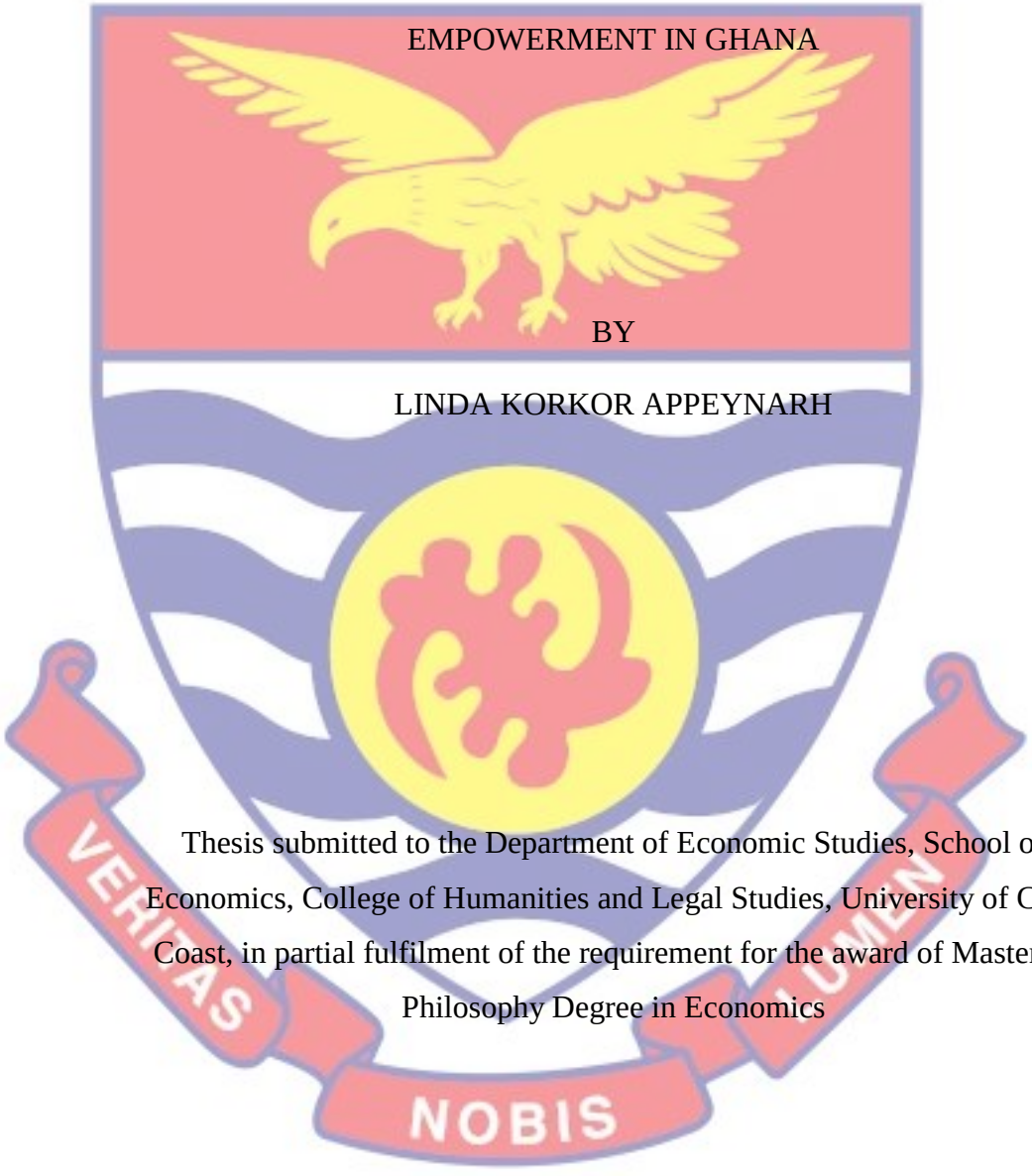

BY

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature …… Date ……

Name: Linda Korkor Appeynarh

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Supervisor's Signature…… Date ……

Name: Prof. James Atta Peprah

Co-Supervisor's Signature…… Date ……

Name: Dr. Joshua Sebu

ABSTRACT

This study employed the structural equation model with the maximum likelihood estimation technique to examine the effect of digital financial services on women economic empowerment in Ghana. Secondary data from the Ghana living standard survey round 7 was used for the study with a sample size of 11,308 women. The study found that, digital financial services (ATM, E-zwich, E-banking and mobile money) had significant relationship with socio-economic correlates such as education, autonomy, ICT skills, residence (rural/urban) and region among women in Ghana. The study also revealed that digital financial services had a significant effect on women economic empowerment, implying the enhancing effect digital financial services has on women economic empowerment. Considering the results, the study recommended that, policy makers and financial service providers should institute measures that enhance access to and utilization of digital financial products among women.

KEYWORDS

Digital Financial Services

E-zwich

Electronic Banking

Mobile Money

Women Economic Empowerment

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DEDICATION

To my family

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LIST OF ABBREVIATIONS

ADB	Agricultural Development Bank
AFI	Alliance for Financial Inclusion
ATM	Automated Teller Machine
BOG	Bank of Ghana
CGAP	Consultative Group to Assist the Poor
DFID	Department for International Development
DFS	Digital Financial Services
DIT	Diffusion of Innovation Theory
E-BANKING	Electronic Banking
G2P	Government to Person
GAC	Global Affairs Canada
GDP	Gross Domestic Product
GHIPSS	Ghana Interbank Payment and Settlement System
GLSS	Ghana Living Standard Survey
GSS	Ghana Statistical Service
ICRW	International Centre for Research on Women
ICT	Information and Communication Technology
IFI	International Financial Inclusion
IT	Information Technology
KYC	Know Your Customer
MLE	Maximum Likelihood Estimation
MNOs	Mobile Network Operators
MOMO	Mobile Money
MSMES	Micro, Small and Medium-sized Enterprises

NBFIs	Non-Banking Financial Institutions
NFC	Near Field Communication
NREGA	National Rural Employment Guarantee Act
OECD	Organization for Economic Co-operation and Development
POS	Point of Sale
SDGs	Sustainable Development Goals
SEM	Structural Equation Model
SHGs	Self Help Groups
TAM	Technology Acceptance Model
TBP	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UNPF	United Nations Population Fund
USSD	Unstructured Supplementary Service Data
WEE	Women Economic Empowerment

CHAPTER ONE

INTRODUCTION

The introduction of this study has been presented in this chapter. The sub-themes include the background to the study, statement of the problem, research objectives, hypotheses, question and the significance of the study. It further talks about the delimitation and limitation of the study as well as the organization of the rest of the chapters of the study.

Background of the Study

Account ownership is almost universal in high-income OECD countries, but women in emerging economies are less likely than men to have an account, and those who do rarely utilize it. Demirgüç-Kunt and Klapper (2013) found that women make up the majority of the world's two billion adults without an account.

The World Bank's 2018 financial sector summary report also indicate that, the two billion women and over without any formal financial account worldwide, lack access to and use of formal financial services like savings, investments, and insurance (World Bank, 2018). Having access to formal accounts is necessary in enabling people make and receive payments. Hence, it is the primary step toward gaining access to a greater collection of financial services, including savings, insurance, and credit.

The access to and use of quality financial products is an indispensable way to reduce poverty and enhance economic growth (Holloway, Niazi & Rouse, 2017). However, despite the critical role financial products and services play in an economy, around one-third of the world's adults are without access to basic transaction accounts (Pazarbasioglu et al., 2020).

According to Beck, Levine and Loayza (2000), at the macro level of an economy, proficient allocation of capital by countries with an improved financial system promote economic growth and reduce poverty and income inequality. Similarly, at the micro level, the availability and use of essential financial services can improve the lives of the poor, thus, evident in reducing poverty levels of women and increasing their resilience (Demirgüç-Kunt & Singer, 2017). Dupas and Robinson (2013), argued that people who engage in the financial systems (such as savings, insurance, credit and investments) are able to manage risk in a better way, finance a business and fund large expenses such as education or shelter.

Economic inequality is intensified by the gender disparity in financial access, which reinforces women's economic subordination (Allen, Demirgüç-Kunt, Klapper & Peria, 2016). Adults who are financially excluded save money and make payments, but since they lack access to structured financial institutions, they are forced to transact in risky and wasteful ways (Cull, Demirgüç-Kunt & Lyman, 2012). Women with no access to bank account often keep their savings at home and other places where they can easily lose their savings (Bermeo, 2019; Schreiner & Sherraden, 2007).

Technological revolution of the financial sector has resulted in the growth of Digital Financial Service (DFS), a pool of financial services including payments, credit, savings, remittances, insurance, and financial information which are accessed and delivered through digital channels such as the internet, mobile phones (both smartphones and feature phones), Automated Teller Machines (ATMs), Point of Sale (POS) terminals, Near Field Communication (NFC) enabled devices, chips, electronically enabled

cards, biometric devices, tablets, phablets, and any other digital system considered to be digital channels (AFI, 2016).

The influx of DFS in Ghana has the ability to provide affordable, convenient, and secure banking services (Afoakwah, Annim & Peprah, 2015). Digital financial inclusion, which is characterized as digital access to and use of formal financial services by excluded and disadvantaged people, encourages efficient connectivity among economic participants (Dara, 2018). In Ghana, this novel innovation of rendering financial services takes place through various medium such as mobile phones (i.e., mobile money and electronic banking apps and Unstructured Supplementary Service Data (USSD). Other mediums also include; ATM, internet banking, POS terminal and electronically abled cards. Thus, DFS leads to reducing most of the constraints posed by the traditional financial system in terms of its access and usage (Philippon, 2019).

In 2018, Ghana announced to the world its first DFS scheme, building on the country's five-year exponential growth in the sector. One of the policy's goals on DFS is to have at least 85 percent of men and women to have financial accounts by 2023 (Mattern & McKay, 2018). Applying a gender lens to the policy's implementation would be crucial to improving women's financial inclusion, as women's access to and use of financial services continue to lag behind that of men (Agyapong, 2021).

The swift growth of the use of DFSs have seen an improvement in accessing formal finance through digitization by those that remain unbanked (Dupas & Robinson, 2013). The growth in the financial sector is highly pinned to DFS from 22 percent in 2010 to 39 percent in 2015 (Findex, 2015). DFS

growth is more promising in the general advancement of gender equality which can be harnessed by the access to finance. Consequently, the utilization of DFS is the means by which Women Economic Empowerment (WEE) can be improved both within homes and within local economies (Kabir & Klugman, 2019).

Women can become economically empowered through access and use of digital financial services. These include, making financial choices, having access to critical services (health, or energy), control over economic resources and improvement of bargaining power at the household level (Dupas & Robinson, 2013; Taylor & Pereznieto, 2014). Enhancing WEE is, therefore, a critical determinant for the use of DFS among women. It is against this backdrop this study investigates digital financial services and women economic empowerment in Ghana.

Statement of the Problem

According to the World Bank's Global Findex, the proportion of Ghanaians above 14 years who have a formal financial account increased by 42 percent between 2014 and 2015 (World Bank, 2019). Males accounts ownership in rural areas is 61 percent compared to only 39 percent of females. Also, in the urban areas, males account ownership is 54 percent compared to 46 percent for females (GSS, 2014). This high disparity has led to efforts by the government to implement policies and programmes to bridge this gap. These include creating the enabling environment for financial institutions, Fintechs and telecommunication operators in the introduction of mobile money services, digital deposit and payment accounts, credit, and insurance, through mobile phone platforms and agency banking. Thus, to allow for

financial services to be offered in alignment to banking and telecom sector (Financial Inclusion Insights, 2015).

In other studies that do not specifically concentrate on DFS, it is relatively well established that the influence of information asymmetry on women's negotiating power and the allocation of resources within the household can be attributed to the private of financial information (Ashraf, 2009; Castilla & Walker, 2013; Duflo & Udry, 2004; Doss, 2006; Morawczynski & Pickens, 2009; Ashraf, Field & Lee, 2014; Doepke & Tertilt, 2019).

In recent years, Ghana has observed an exponential upsurge in the use of DFS such as credit, payment, savings which are delivered through mobile phones, ATM, Ezwich, POS terminals and internet (Agyapong, 2021). Consequently, several online and digital platforms are being set up to facilitate transactions and promote financial inclusion among youth and women (Rasheed, Siddiqui, Mahmood & Khan, 2019; Osabuohien & Karakara, 2018).

The rise in the use of digital financial systems in Ghana has attracted scholarly attention. The focus of previous studies on this development has been on mobile money and micro finance integration (Aboagye & Anong, 2020), implications of digital economy for financial institutions in Ghana (Agyapong, 2021), the impact of Information Communication Technology (ICT) on financial sector reforms in Ghana (Asamoah & Owusu-Agyei, 2020), and the impact of digital banking on the profitability of deposit money banks (Boateng, 2020). Categorically, the effect of DFS on WEE have received scanty consideration on both policy and academic fronts. Meanwhile this knowledge is necessary in crafting appropriate policies regarding institutions

that are critical in empowering women. Hence this study seeks to address the question: what role digital financial services play in women economic empowerment?

Purpose of the Study

The purpose of the study is to ascertain the effect of digital financial services on women economic empowerment in Ghana. Categorically, the study seeks to;

1. Determine the relationship between digital financial services and socio-economic correlates among women in Ghana.
2. Investigate the determinants of digital financial services among women in Ghana.
3. Examine the effect of digital financial services on women economic empowerment in Ghana.

Hypotheses of the Study

H_0: There is no significant relationship between digital financial services and socio-economic correlates (education, autonomy, ICT skills, residence, region) among women in Ghana.

H_0: There is no significant effect of digital financial services on women economic empowerment in Ghana.

Research Question

What are the determinants of digital financial services among women in Ghana?

Significance of the Study

The findings of the study would be useful to the Bank of Ghana and the Ministry of Finance to create policies that would encourage financial

institutions to incorporate DFS as a means of financial transactions. Also, for FinTech and mobile money operators to design and provide DFS products that best suit the needs of women. Further this study would encourage stakeholders in the DFS ecosystem to broaden their services to cater for basic financial service women engage in such as loans, payment, and savings to improve their economic empowerment and welfare.

With emphasis on the effect of DFS on WEE, findings from this study will be useful to women especially in sensitizing them to improve on the use of DFS and rediscovering other ways by which DFS adoption can lead to their economic empowerment. Finally, this study will contribute to the existing literature on digital financial ecosystem, as well as development economics.

Delimitation of the Study

The study mainly focused on examining the influence of digital financial services on women economic empowerment in Ghana. The study was undertaken across the ten administrative regions of Ghana according to the seventh round of the GLSS collected in 2017. The study concentrated on the various types of digital financial services that are used by women who are 15 years and above, because according to OECD's classification, 15 years forms the labour force participation age criteria.

Limitations of the Study

It is essential to keep in mind that DFS is susceptible to major instances of cyber robbery in addition to other security difficulties. In point of fact, the demand for confidence arises in a precarious setting (Mayer, Davis & Schoorman, 1995). Consequently, next research must take into consideration how important trust and confidence are. Nevertheless, risks, trust, and

confidence, and their connections to DFS, were not taken into account in this study.

WEE was measured in terms of autonomy, work hours and income level due to an inadequate data set. Again, the study could not capture every type of DFS aside the four types that were used. Future studies should therefore focus on collecting information directly from women who use DFS and those who do not use as well as information from the service providers.

Organisation of the study

The research is organized into six chapters. Chapter Two presents an overview of Ghana's digital financial services. Chapter Three of the study is focused on the literature review. Chapter Four presents the research methods. Chapter Five displays and discusses the study results. The concluding chapter, Chapter Six, summarises the findings and conclusions of the study.

CHAPTER TWO

OVERVIEW OF DIGITAL FINANCIAL SERVICES AND WOMEN ECONOMIC EMPOWERMENT IN GHANA

Introduction

This chapter introduces the overview of DFS and WEE in Ghana by considering the evolution of DFS in Ghana, the use and contribution of DFS in Ghana, DFS and gender gap, and how these services specifically enhance the economic empowerment of women in Ghana. It also discusses barriers associated with the use of DFS among Ghanaian women as well as Government policies on DFS that recognizes economic empowerment of women in Ghana.

The Evolution of Digital Financial Services in Ghana

The innovations in the financial sector birthed DFS as a result acknowledging all of its positive inputs in the sector in terms of development and easy access. ATM has been the most innovative electrical breakthrough in Ghana and around the world. The first ATM was installed in 1995 by Trust Bank Ghana (now part of the Ecobank Group). Subsequently, a significant number of other "big banks" have established ATM networks in competitive and key regions in Ghana. The services have been networked by various banks thereby increasing their utility to users.

In 2001, the Ghana Commercial Bank introduced its first ATM service, in collaboration with the Agricultural Development Bank. Almost all major banks now have ATMs in Ghana. The ATM has become the most effective consumer banking delivery method. Customers value it in their bank selection, and banks that delayed in the adoption of ATM systems have struggled to

keep up. By being networked, ATMs have helped to consolidate the one-branch concept in Ghana by eradicating the need for consumers to visit their branch to complete their banking transactions (World Bank Database, 2018).

The Bank of Ghana (BOG) developed and initiated a National Switch and Smart Card payment system in 2008 as part of its attempts to enhance branchless banking and universal financial inclusion. The biometric switch and smart card payment system administered by Ghana Interbank Payment and Settlement System (GHIPSS), a BOG subsidiary, is known as E-zwich. This service provides Ghanaians around the country with access to banking and retail services (Agyapong, 2021). E-zwich cardholders can use their cards to undertake banking and retail transactions at other E-zwich financial institutions, as well as E-zwich POS and ATM machines.

Both online and offline payments are accepted by E-zwich POS. This dual capacity enables E-zwich services to be accessible throughout the country, independent of the communication infrastructure or network in a particular place. According to GHIPSS, the E-zwich smart-card is presently the only card in Ghana that provides cardholders, retail merchants, and other corporate users with countrywide access and enhanced transaction management. Through the biometric (fingerprint) client authentication technology, E-zwich card holders benefit from the greatest security requirements (Sakoe, 2015).

Telecommunication networks in Ghana cooperated with banks to offer a new type of banking to clients' doorsteps known as mobile banking which considerably developed in Ghana. Mobile banking is quickly becoming a more convenient and accessible way of transferring money or making

payments in Ghana due to the increasing use of mobile phones. MTN Ghana, Ghana's biggest telecommunications company, was the first to launch MTN mobile money. Customers could use this service to send money to other individuals anywhere in the country using their mobile phones. This was done in partnership with large institutions such as Ghana Commercial Bank, Universal Merchant Bank among others (Musah, 2018).

Airtel Ghana was the next to introduce "ZAP," which aided customers to send and receive money via mobile phone. Because the ZAP was not a necessarily popular product, Airtel relaunched it as Airtel Money, which competes favourably with the MTN Mobile Money. Tigo also announced Tigo Cash. All of these constitute methods of transmitting money via mobile phone (Sakoe, 2015).

The Use and Contribution of Digital Financial Services in Ghana

According to the World Bank (2019), DFS maintains a robust capacity for growing financial inclusion in Ghana. Indeed, mobile money contributed for 7 of the 17 percent rise in formal financial inclusion between 2010 and 2015. Then, another eight percent factor had been covered via the means of mobile money and Nonbanking Financial Institutions (NBFIs). There is an account for a rise in the influx of mobile money in Ghana. This is because, barring traditional constraints, mobile money looks to be the most affordable option for rural and geographically dispersed communities to use rather than banks (Benami & Carter, 2021; Jahan, De, Jamaludin, Sodsriwiboon & Sullivan, 2019).

The availability of financial services varies by geography (regions) and key demographics. Despite having made the highest increases in financial

inclusion, the country's five most deprived areas (Upper West, Northern, Volta, Upper East, and Brong Ahafo) continue to be financially side lined the most (Anane & Nie, 2022). Rural population and women, on the other hand, have lower contact to banks than their urban and male counterparts (Konadu-Agyemang, 2004). Non-bank Financial Institution (NBFIs) and informal financial services are used more significantly by rural inhabitants, women, and the poor than by urban people, men, and the well-to-do (Asiamah, 2017). In addition, rural population, women, and the impoverished, in totality, prefer to use mobile money and non-bank financial institutions (NBFIs) such as Omega Security and Financial Company Ghana Ltd., Credit Bond Finance E-banking Company Ghana and the like, over banks.

According to Duncombe and Boateng (2009), the use of various financial services in Ghana such as remittances and savings products have increased, indicating a growing need for such important services delivered via digital means. While the usage of credit products dropped from 9 to 7 percent between 2010 and 2015 and formal remittances virtually quadrupled from 5 to 24 percent, the use of savings products and insurance increased from 5 to 11 percent over that same time period (Ahamed & Mallick, 2019). Transactions made using mobile money accounted for more than two-thirds of the total rise in both savings and remittances, making them a crucial factor in the growth of both categories. As of late 2015, the six main DFS providers on the market (country) were MTN, Tigo, Airtel, Vodafone, Fidelity Bank, and E-Zwich. MTN, Tigo, Airtel, and Vodafone are among the mobile network providers (MNOs) that offer mobile money services throughout the country (Lunberry, 2020).

Ghana was rated by the World Bank as Africa's fastest-growing mobile money market in 2019, which attracted many recommendations to further financial inclusion (Anane-Fosuhene, 2019). These included digitizing government-to-persons payments (G2P), enabling agent banking for the last mile, integrating informal financial channels to formal financial services, boosting consumer financial skills, and using data to expand financial access (Alhassan, 2020; Nicoletti, 2021).

Digital Financial Services and the Gender Gap

While the use of digital financial services has grown considerably in Ghana during the last few decades, it appears there is an acute gender inequality in the adoption of these financial services. Categorically, more men than women access DFS. This might be attributable to Ghanaian women's continued reliance on non-bank and non-formal financial services.

The percentages of women and men who owned accounts augmented from 37 and 45 percent to 57 and 62 percent, respectively (Osei-Assibey, 2010). However, the percentage of women who have access to informal financial services has grown somewhat, from 18 to 20 percent, while that of men stayed unchanged at 12 percent. Demirgüç-Kunt and Klapper (2013) found that just 31 percent of women had bank accounts in 2015, paralleled to 43 percent of men.

Women utilize nonbank formal (26%) and informal (20%) financial services at a higher rate than males, who use at 19 percent and 12 percent, respectively (World Bank, 2013). This is to say that, with respect to owning financial accounts, men are more advantaged than women. However, women

tend to substantially have an increasing rate in the adoption of DFS, which is also a driver of financial inclusion than the men.

Women Economic Empowerment

Empowerment refers to taking charge of one's life by choosing one's own goals, learning new skills, increasing one's self-confidence, overcoming difficulties, and increasing their self-reliance (Copeland, 2018).

Musokotwane, Siwale and Nkhata (2001) define it as a process by which individuals in marginalized communities acquire access to information, resources, decision-making authority, and an understanding of the need of community engagement in order to obtain control over their own settings. Empowerment is therefore a process of first transforming an individual's power potential and then changing relationships at various group and societal levels (Sultana & Hasan, 2010).

Building on this, a woman is economically empowered when she has the capacity to thrive and grow economically, as well as the authority to make and act on economic decisions (Amin, 2009). Women's empowerment is a necessary precondition for poverty reduction and the protection of human rights, particularly at the individual level, since it contributes to the establishment of a foundation for societal change (Department for International Development (DFID), 2006).

Notably, women empowerment is also a path to increasing gender equality because it gives women more authority and autonomy over their lives (United Nations Population Fund (UNPF), 2015).

Digital Financial Services and Women Economic Empowerment

After years of financial sector innovation and numerous changes in government policies, DFS have been seen to champion women's rights and economic empowerment. Though the financial sector remains disproportionately male-dominated, it is safe to assume that the benefits of DFS will go a long way toward inducing development in the financial sector as well as its users, particularly in terms of economically empowering women.

DFSs are critical to attaining this aim because they increase women's financial autonomy, encourage women's labour-force participation, and improve the performance of their businesses. According to Perlman (2018), DFS advocates the third G20 Principle for Innovative Financial Inclusion (IFI), which encourages the use of technological and institutional innovations to extend financial services access. These principles are critical for improving economic participation for the more than 2 billion people worldwide without access to formal financial services, the vast majority of whom are women (Guermond, 2020).

DFS is a feasible option for narrowing the gender gap in account ownership and increasing formal financial activity in both volume and value terms (McKay & Perkins, 2010). Women may profit from digitalization by cultivating an environment conducive to the development of transparent, affordable, accessible, and high-quality financial goods and services. Providing women with the option to save formally is one of the results, which could improve their formal engagement in the economy (Hunt, Layton & Prince, 2015).

Gender equality necessitates women's financial inclusion. It gives women more financial control over their lives and empowers them (Aker, Boumnijel, McClelland & Tierney, 2016). This has a beneficial influence on the entire family or home. Women can transact conveniently and effectively from the comfort of their own communities, businesses, and homes when the service is given via mobile phone platforms and agency banking. DFS can help women earn more money by letting them receive or transfer funds without having to travel to a bank to deposit a check or make a payment, such as school tuition for a child. Additionally, women may leverage digitalization to make saving for a child's education, a medical emergency, or an unexpected job loss safer and simpler (Klapper & Singer, 2017).

DFS can assist women in establishing a credit history, which opens the door to bank loans that can assist them in purchasing a home or starting a business (Pazarbasioglu et.al, 2020). It can also afford women with more opportunities to work remotely or in their communities and run their own enterprises (Hendriks, 2019). DFS has been essential in assisting women in Ghana and other Sub-Saharan African nations in transitioning from subsistence farming to more viable livelihoods (Awudjah, 2019).

By improving access to financial markets and formal loans, digitization can help women-owned companies grow and prosper. DFS and other financial innovations improve the efficiency with which financial services are delivered and improve information about borrowers and micro, small, and medium-sized companies (MSMEs) (Agbozo & Yeboah, 2012; Anwuni, 2018; Egyir, 2010). This ensures women’s use of financial services, thereby improving the performance of women owned businesses.

Barriers Associated with the use of Digital Financial Services

Government policies on DFS that have been set to target the empowerment of women economically have its motivation pinned on the outstanding benefits of the service. Aside the intriguing advantages associated with the use of DFS, there are also some barriers related with its usage. The barriers involved with the use of DFS include; issues of privacy, reliability in terms of bad network, poor authentication process (Fatima, 2011). A number of barriers including lack of knowledge of the advantages of DFS, lack of digital literacy, and issues with technology and networking have also been acknowledged with the use of DFS (Harsh & Wright, 2016). Furthermore, As Chauhan, (2015) points out, agents and mobile network operators (MNOs) face a lack of training and expertise, in addition to legal and regulatory issues arising from the need to keep up with changing technologies (Holley, 2015).

Additional barriers associated with the use of DFS include internet access being non-existent, inability to reach majority of consumers, lack of integration and interoperability, lack of trust, inability to transact in low-value transactions, and gender difference in mobile ownership (Briggs, 2016).

Government Policies on Digital Financial Services and Women Economic Empowerment in Ghana

DFS makes creative financial inclusion possible. As a result, such financial services must be incorporated into Ghana's financial sector's legislative structure. In May 2020, the Ministry of Finance introduced three policy efforts to advance financial inclusion and digital transformation: the National Strategy for Financial Inclusion and Development, the Digital Financial Services Policy, and the Cash-Lite Roadmap (Asamoah & Owusu-

Agyei, 2020). These regulations will strengthen Ghana's digital financial landscape and build on the accomplishments over the last decade, vis a vis directing the development of a cash-lite economy, which is becoming increasingly important in the COVID-19 era.

In partnership with the Consultative Group to Assist the Poor (CGAP) the DFS strategy aspires to promote a resilient, inclusive, and innovative digital environment that contributes to social development, economic success, and private sector advancement. The policy established a four-year plan (2020-2023) for short- and medium-term improvements in six sectors, including improving governance of the DFS ecosystem, supporting fintech, establishing a working regulatory framework, consciously building the power of authorities to supervise the space, assisting in the development of market infrastructure for digital financial services, and driving the widening of digital financial services, which includes payments, savings, credits, and insurance (Ofori-Atta, 2018).

In terms of the channels by which DFS are provided (such as mobile payment, prepaid cards, and the internet), the banking sector should be prioritized in order to eliminate money laundering and terrorism funding threats and preserve the financial industry's integrity and stability. This would increase women's ability to accept additional products based on their convenience and trustworthiness, resulting in increased financial inclusion. In this light, the legislative framework ought to be strengthened to involve monetary casualties among the sanctions imposed on financial institutions and NBFIs that violate mandatory anti-money laundering or counter-terrorist financing responsibilities. Specifically, this change should be made so that

financial institutions and NBFIs can be held accountable for their actions. (Ofori-Atta, 2018).

A financial policy pillar seeks to expand access to and use of new financial products and services that are customized to the requirements of the financially maligned population by expanding DFS, increasing the proximity of financial access points, and offering a variety of affordable products and services for women (Ofori-Atta, 2018). The substantial distance between financial service access points, such as banks or ATMs, is impeding the spread of financial services in Ghana. Although the amount of bank branches and ATMs per 100,000 people increased to 8.6 and 11.5 in 2017, correspondingly, additional growth and modification of access sites is required to encourage utilization via improved closeness (World Bank Group, 2019). Ghana should encourage agent banking, among other things, by better understanding the impediments to the venture's wider acceptance by financial institutions (Abor & Biekpe, 2007).

According to Cudjoe, Anim, and Tetteh Nyanyofio (2015), proximity to traditional access points will not, on its own, improve women's financial inclusion difficulties. DFS advancements have enabled women who live outside the reach of financial institution branches to initiate financial transactions utilizing electronic devices such as cell phones. As previously noted, mobile money reported 7 percentage points of the 17-percentage-point upsurge in access to formal financial services since 2010, with the combined use of mobile money and NBFIs accounting for an additional 8 percentage points. The DFS approach is centred on strategies to increase financial

inclusion through the transition away from cash and toward digital payments (Amankwah-Amoah & Hinson, 2019).

Furthermore, the full potential of DFS must be realized by guaranteeing that interoperability between mobile network operators (MNOs) and banks is financially sustainable and reduces costs for women (Ozili, 2020). To improve the quality of agents and cut prices, concrete actions are needed, such as an evaluation of the mobile money value chain and MNO business operations to identify the sources of expenses and fees (Anamuah-Mensah & Marfo, 2009). Additionally, a complete ecosystem is required to enhance DFS's value proposition by promoting additional products and services such as mobile-based unsecured lending, savings, microinsurance, and government-to-people and people-to-government payments to address the needs of women, who are known to face a higher rate of exclusion (World Bank, 2019).

Basic financial products that might benefit Ghana's lower economic divisions are either unavailable or underdeveloped (Fiador & Amidu, 2021). As a result, promoting new and creative low-cost products and services is critical. Thus, a simple transaction account with slight Know Your Customer (KYC) criteria must be created, regulated, and promoted (Alexandre, Mas & Radcliffe, 2011).

Financial institutions ought to be furnished with the necessary skills and information to ascertain women's creditworthiness and customize products to their specific requirements and capacities, given that low levels of financial inclusion reflect financial institutions' failure to care for the marginalized population (Geiger, Kwakye, Vicente, Wiafe & Boakye Adjei, 2019). To

make women economically empowered, it is necessary to provide particular technical assistance to financial institutions regarding credit information and risk-sharing systems.

Chapter Summary

This section highlighted and discussed the evolution of DFS in Ghana as well as the use and contribution of DFS. Further discussion was on DFS and the gender gap, then, DFS and the economic empowerment of women. Finally, barriers associated with the use of DFS as well as some government policies that have been set in line with DFS recognising WEE were discussed.

CHAPTER THREE

LITERATURE REVIEW

Introduction

This chapter focused on the review of related literature. It is structured in three different sections. The first section addresses the general concept of DFS and its benefits. The second section delves deeper into the theoretical foundations of digital financial services and women economic empowerment in Ghana. Various empirical works on topics associated to the research problem were emphasised and discussed in the third section of this chapter. In this section, studies conducted by various authors and academic scholars about the use of DFS among women are carefully reviewed and presented. Then, the synthesis of the literature reviewed and a summary of the entire chapter.

Digital Financial Services

Digital financial services can be characterized by the use of digital technology to access and deliver financial services. DFS is described broadly as a wide range of financial services accessible and delivered via digital channels, such as payments, credit, savings, remittances, and insurance (AFI, 2016). DFS, according to Ozili (2018), extends beyond financial services to include the products, technology, and/or infrastructure that allow consumers and organizations to acquire financial services without visiting a traditional bank. Digital financial services are composed of several vital components, including digital transactional platforms, digital services and instruments, retail agents, and other financial services accessible via the digital financial platform (Villasenor, West & Lewis, 2015). DFSs are functional in promoting the use of digital channels such as mobile phones, point-of-sale terminals, and

automated teller machines, rather than traditional cash-based transactions, which are all part of finance (FinTech, 2015). Additionally, DFS enables consumers and service providers to do financial transactions with little or no interaction in person.

According to the World Bank (2019), computerized money linked administrations refer to the use of modern technologies to obtain monetary administrations and carry out budgetary transactions. As a result, DFS refers to a broad variety of technologies that can be used to deliver financial services from a wide range of suppliers to a large range of recipients. This is made feasible by the adoption of digital remote means such as e-money, mobile money, card payments, and electronic financial transfers (Michelle, 2016).

Benefits of Digital Financial Services

Digital financial services give a variety of benefits to all stakeholders in the business (Ozili, 2018). The key stakeholders in the DFS sub-sector include DFS providers, DFS consumers, governments, and the economy. DFS has a good influence on the provision of financial services in Ghana. According to the World Bank, reducing cash-based transactions reduces losses, theft, and other financial crimes associated with such transactions. DFS has also spawned new banks, which provide banking services solely online and do not have physical locations (Pazarbasioglu et al., 2020). A typical example of financial institutions that have been borne out of recent financial innovations is Wise (TransferWise) which offers mobile bank accounts to Ghanaians. This avoids the costs of constructing and maintaining physical facilities. Even at traditional brick-and-mortar banks, digitization of services has aided in the uncovering and inhibition of fraud (Kehr, Tonkin & Bihler, 2017).

For businesses, digital payment methods minimize travel time and costs, allowing them to register and pay for company licenses and permits more quickly (Klapper, 2017). Also, Digital financial services have a positive influence on customer experience (Barbu, Florea, Dabija & Barbu, 2021). These services increase financial inclusion and ease access to money from financial institutions. For instance, the ATM which is an example of DFS enhances remote contact to financial services, thereby saving the productive time of users of financial services (Karlan et al., 2016). In-person banking services, particularly in developing nations, have a restricted time period, limiting access to financial services. However, DFS overturns this challenge by making financial services accessible at any time, thereby enabling users of financial services to channel their productive time to other productive uses.

Regarding the economy, DFS lead to an increase in GDP. Manasseh et al., (2022) investigated the long-term causal connection between digital financial inclusion and economic growth in 22 Sub-Saharan African nations, including Ghana. They discovered that DFS is critical in supporting economic growth. This is due to DFSs efforts to make financial services more accessible, resulting in increased aggregate spending (Ozili, 2018). Indeed, according to a McKinsey Global Institute study, the broad use of DFS might boost GDP in emerging nations by 6 percent by 2025. Also, DFS expands access to credit services for individuals with lower incomes, helping to alleviate poverty and improve living conditions, in general (Ibor, Offiong & Mendie, 2017). All these lead to a manifestation that DFS encourage transparency and accountability in an economy (Mungai, 2019).

Theoretical Review

Several theories have been propounded to forecast a new system's acceptance and adoption by users. The current study focuses on the feminist political economy and the technology Acceptance model (TAM). These two theories form the study's foundation.

Feminist political economy

The feminist political economy encompasses the theories of Marx, Smith, Ricardo, Mill, Polanyi and Veblen. In the nineteenth century, women's rights advocates and writers such as Harriet Taylor Mill (1807–58) and Charlotte Perkins Gilman (1860–1935) focused on the segregation of women from economic activity and their unrelenting dependence on men. This theory investigates the roles that women play, the tensions that arise from women's paid and unpaid employment, the ways in which production and reproduction concerns impact women, and the relations that take place at the micro and macro level within the contexts of women's life. Feminist political economics postulates that women are impacted positively when women's earnings are less than men's pay, and that women are inclined to be limited to the domestic sphere because their labour in the market cannot be converted into monetary compensation for their efforts.

Women that participate in the labour market typically do so in order to provide a reserve supply of labour on a daily, weekly, seasonal, or part-time basis in order to meet demand (Loutfi, 2001). The simultaneous demands of their job in the home and the labour market have a positive effect on the way in which women take part in the workforce, as well as on the sex exclusion of

women's employment and women's earnings. This is because women tend to get paid less than men for doing the same work (Bauhardt, 2012).

In addition to the Marxist analysis, the primary focus of feminist theory is on issues concerning the participation of women in the labour market and the amount of money they earn. The results of singular maximizing decisions and evaluations conducted in accordance with the marginal principle as well as standards for efficiency are the primary focal points of feminist political economy (Haidinger & Knittler, 2014). In such a context, the segregation of women from the labour market can be considered ineffective and detrimental to welfare, given that not all people who are capable of working are now employed in the economy (Biesecker, Wichterich & Winterfeld, 2012).

Some of the reasons that point to why more women are participating in the labour market are improvements in educational opportunities, increased productivity in households as a result of technological advancements, decreased birth rates, and an increase in labour demand, particularly in the service sector (Knapp, 2002). It is possible to explain why women get lower salaries on the labour market by pointing to the larger concentration of women in certain areas. One of such industry is the healthcare industry (Suda, 2002). That is to say, in the service sector, women who have a smaller investment in human capital may be because they are potentially taking care of the children.

This is to emphasize that the theory is applicable to women engaged in economic activities in a more liberal or capitalistic system. In addition, their engagement and usage of the DFS could be determined by the socio-economic correlates (education, autonomy, and residence (rural/urban), ICT

skills) of women and how different these correlates relate to their use of DFS. Based on this theory, the effect of DFS on WEE, is on the basis of recognition-redistribution dimensions in terms of their education, ICT skills, age, marital status, residence, use of internet, household size and household head associated with women's usage of digital financial services. Therefore, the effect of DFS on WEE is as a result of a direct influence of the use of DFS on their income level, work hours and autonomy.

Technology acceptance model

Fred Davis created the Technology Acceptance Model (TAM) framework in 1989, and it was based on the theory of reasoned Action (TRA). TAM was created to research information systems, but it has subsequently been applied to the acceptance and usage of a wide-range of technology systems (Legris, Ingham & Collerette, 2003). TAM is a solid and powerful model for projecting people's acceptance of technology (Gu, Lee, & Suh, 2009).

Davis outlines two primary elements that drive technology acceptance; “perceived utility” and “perceived ease of use.” Both of these elements can have an effect on an individual's attitude toward technology, behavioural intent to use, and actual system usage. Subsequently, an individual's decision to adopt technology can be driven by both internal and external elements such as perceived worth and ease of use. Perceived ease of use is defined as "the degree to which a person believes that using a particular system would be free of effort," and perceived worth is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989).

Self-efficacy and facilitating conditions, as stated by Gu et al. (2009), comprise perceived ease of use. Self-efficacy refers to a user's perception that they can use technology to complete a specific task. The facilitating condition is defined as "the external surroundings that assist users in overcoming barriers and hurdles in order to use new IT" (Gu et al., 2009). Digital financial services (such as mobile money, ATM, E-zwich) will be perceived as simple to use by women with strong self-efficacy and facilitating locations. Women must see to it that they will be able to use the technology, that there would be a cure should the product fail to live up to expectation, and that the technology is dependable before agreeing to use it. The utility and ease of use of a product will influence a user's attitude toward the technology and ultimately their decision to accept and employ it (Spencer, Nakhai & Weinstock, 2018).

Conceptual Review

In the current world, the worth of women's empowerment has been recognized, and the stereotype has been broken. Women are often claimed to be disproportionately vulnerable due to a lack of capital and salary parity, rising gendered labour standards, and exclusion from essential services, all of which necessitate special protection efforts (Siddik, 2017). In 2016, the World Bank acknowledged women's empowerment as a guiding concept for attaining the Sustainable Development Goals (SDGs). Economic empowerment has been noted in the literature as a critical component of women's empowerment. Economic empowerment has a direct influence on women's financial well-being and decision-making ability.

Women's empowerment has long been regarded as a governmental goal as well as a means of increasing global prosperity (Haque & Zulfiqar,

2016). Women economic empowerment is essential for respecting women's rights and attaining larger development goals such as economic growth, poverty reduction, and social welfare. According to Golla, Malhotra, Nanda and Mehra (2011), when women have the capacity to succeed and advance economically, as well as the ability to make sound financial decisions, they are economically driven.

Women economic empowerment refers to their right to gain access to, own, and manage wealth in order to achieve their life goals (Brody et al., 2015). Economically empowered women, according to Broody et al., (2015), will contribute to family welfare and decision-making. All developing countries are increasingly realizing the importance of encouraging women to engage in economic activities in order to empower women by integrating them into the mainstream development process, restoring their economic status, and providing employment opportunities through self-employment and entrepreneurship development (Wachira & Kihiu, 2012).

Many studies have been conducted on women's empowerment by Self Help Groups (SHGs), and it has been determined that SHGs is critical in the development of women empowerment from rural, semi-urban, and urban areas. Venkatesh and Kala (2010) reported on observations from research done in southern Tamil Nadu, India, which revealed that women's income and monthly household outflow rose significantly after joining a SHG. The activities of SHGs are said to be effective when loans are repaid on time and in full.

Furthermore, SHGs in South Tamil Nadu have been extremely active in promoting women's empowerment in rural areas. Ghosh and Banerjee

(2010) conducted a critical analysis of the impact of social, economic, demographic, and political factors with regard to employment status of SHG members in West Bengal, India. The previous living of members, as well as village-based local politics, have been found to have a substantial impact on jobs and loan use. Garai, Mazumder and Maiti (2012) conducted empirical research in Nadia, West Bengal, India, comparing the outcomes of SHG members and non-members. SHG participants were found to have higher scores in all dimensions of empowerment. In as much as these studies talk about women economic empowerment, they all failed to look at how the use of DFS impact WEE.

Shaheen, Hussain and Mujtaba (2018) studied the influence of microfinance on women's economic empowerment in Lahore, Pakistan. A sample of 175 female clients of the Akhuwat foundation in Lahore was drawn using a disproportionate stratified random sampling procedure. Questionnaires on a five-point Likert scale aided the data collection. Some illustrative cases have also been included in order to witness and comprehend poor women's extraordinary accomplishment. The data was analysed utilizing linear regression with SPSS.v.20. Microfinance has been found to have a significant influence on women's economic empowerment. According to the research, women empowerment is associated with social intermediation or counselling, as well as enterprise growth, which appears to have a lasting influence on reaching financial independence. The findings further support the notion that microfinance may tend to be a catalyst for economic empowerment. The present study's dynamics in this scenario focus on the influence of DFS use and how it improves WEE.

The first step in getting the most out of an economically empowered woman is to assist her in determining what it is that she wants to do, what it is that she is capable of doing efficiently, and what would offer her with the highest returns for the amount of effort that she puts in. According to Shaheen et al. (2018), women are more thoughtful and prefer to spend money on their family. As a direct consequence of having gone through this ordeal, they have had their resolve strengthened to aid their families and communities in climbing out of poverty. Because of the decisions that women make regarding their spending, investing, and access to credit, they have the opportunity to play a more significant role in the economic decision-making process. Women are able to make choices regarding their finances that improve not only their own well-being but also the well-being of their families. A "trickle down" effect will occur as a result of investing in the economic activities of women, which will lead to an increase in the number of jobs that are available to women.

Empirical Review

In this section, we looked at other researchers' previous work that was similar to ours and was done on the same study subject. The significance of this is to amass a body of information on the subject that is being investigated so that ample opportunity can be made available for analysing the data.

Relationship between digital financial services and socio-economic corelates among women

In an effort to inspire women to participate in WEE, access for women to DFS is currently being broadened. It has been discovered that DFS causes an increase in household expenditure (Lee, Morduch, Ravindran, Shonchoy &

Zaman, 2021; Munyegera & Matsumoto, 2016; Suri & Jack, 2016; De Mel, Mcintosh, Sheth & Woodruff, 2022) as well as an increase in household savings (De Mel et al., 2022; Bastian, Bianchi, Goldstein & Montalvao, 2018; Batista & Vicente, 2020; Riley, 2018).

On the other hand, far less is known about the gender-specific impacts. Access to DFS may, in theory, improve WEE, but it may also have unintended implications that lower WEE, such as hurting women's financial privacy or disturbing essential social networks linked with existing financial arrangements. These unintended consequences may affect WEE. It is probable that if DFS is not developed with the requirements of women in mind, it would lead to an increase in the existing gender gap in use of financial services (BRAC, 2020).

Fortunately, governments, commercial providers, and development practitioners are becoming more serious in developing DFS goods and services to boost women's economic empowerment. Examining DFS' effects on individuals might help drive particular policies aimed at making DFS more gender inclusive and empowering. Acquiring capital, bargaining chip, privacy, opportunity cost of time, transaction expenses, and mobility are just a few examples of how DFS has a real impact on the economy.

Access to financial services

Because of the rapid digitization of business, there are at least two ways in which the existing gaps between the sexes in terms of access to financial services can be closed. To begin, it is possible that digital financial services are more effective than traditional ones at reaching residents who do not have official bank accounts. These individuals are disproportionately

women. Similarly, when compared to analogue financial services, DFS just provide better access to elementary formal payment, savings, and credit, not any unique new account features afforded by digital. There are several methods in which a microfinance organization might digitize and distribute credit to its consumers, the majority of whom are women. One of these ways is via using mobile money accounts. If these mobile accounts are used as the initial official accounts of their consumers, then the digitalization of the economy would abolish the financial inequality that currently exists between men and women (Garz et al., 2020).

Female clients with new accounts, on the other hand, may opt for cash and tend to obtain cash from a mobile money agent right away rather than resorting to digital capabilities of their novel mobile accounts. Also, the digital character of accounts may promote new behaviours, hence boosting the utility of official accounts for females and allowing females to avoid certain restrictions that their counterparts may not feel. This is because of the fact that men and women may experience these limits in different ways. It's possible that the same microfinance digitalization scenario that played out in the past could play out again, and this time it will inspire females to deposit a part of their loan amounts in a mobile money account for safety cause. This version of DFS aided empowerment via better security rather than simply boosting access to an analogue account since the loan disbursement process was digitized. This was an unintended consequence of digitizing the loan disbursement process (BRAC, 2020).

Albeit the benefits of DFS for women, intensifying DFS may not be enough to close the gap in financial access between men and women. Indeed,

global statistics on digital technology access implies that extending DFS could worsen gender inequality. Demirgüç-Kunt and Singer (2017) found that 72 percent of males and 62 percent of females worldwide without a bank account (the "unbanked") own a mobile phone (Demirgüç-Kunt & Singer 2017). As a result, gender discrepancies would persist even if the world achieved the admirable aim of widespread use of financial services for all mobile phone holders. Of course, this generalization obscures the fact that gender discrepancies in access to digital technology vary significantly between developing nations. Expanding DFS could, in some cases, significantly minimize the gender gap in financial inclusion.

Bargaining Power

When it comes to household or marital bargaining power, the majority of the theoretical work focuses on internal alternatives; however, expenditure patterns as well as women's reports of their participation in economic decisions affecting the household are frequently used to evaluate bargaining power (Anderson & Eswaran 2009; Heath & Tan, 2020; Majlesi, 2016; Roy, Ara, Das & Quisumbing, 2015).

The access and usage of DFS has the potential to have an effect on external possibilities. As an illustration, direct payments and/or individual registration, in addition to other possible intermediate routes in the context of DFS to WEE, such as reducing the duration it takes to complete transactions or providing more detail privacy, give women more direct control over the resources at their disposal. The impacts of DFS on women's bargaining power were examined by Aker et al., (2016). They observed that in Niger, social safety-net payments delivered via mobile money resulted in a broader choice

of foods and augmented child feeding. They as well showed that this happens as a result of the transfer is made via mobile money rather than access to mobile money.

Privacy

Findings from the study show that women who have more financial privacy and a better understanding of their spouse's finances are better able to control their resources, as evidenced by the expenditure categories in their home. But this does not necessarily mean that a woman enjoys complete financial privacy or is privy to the details of her partner's finances if she has full control over her resources. Because of the anonymity afforded by digital accounts, women may have more control over their financial resources in the long run (BRAC, 2020).

Opportunity Cost of Time

Transfer receivers do not need to conduct as many searches for financial assistance with DFS, which allows them to save time. Muralidharan, Niehaus and Sukhtankar (2016) demonstrated a big experiment in India that was tied to the Mahatma Gandhi National Rural Employment Guarantee Act. They found that biometrically validated payments made using smartcards reduced collection time by 19 percent when compared to the control group (NREGA).

A report suggests that the advent of digitalization may also make it possible to do away with payment delays and leakage. According to Aker et al., (2016) findings, participants in the study saved the time and energy equivalent of 2.5 days by taking public transportation over the course of five months. When salaries are paid via mobile money, firms and employees gain

from cheaper transaction costs, as stated by Blumenstock, Eagle and Fafchamps (2016). Despite the widespread belief that DFS can reduce the duration spent on administrative tasks, the effect of DFS on WEE remains unclear.

According to the findings of Aker et al., (2016), female recipients of cash transfers had the ability to withdraw their funds whenever they choose, which may have allowed them to devote more time to more lucrative forms of agriculture. One example of this would be the cultivation of cash crops. In a trial conducted by a rural bank in the Philippines, Harigaya (2017) found that mobile money transactions saved customers 30 percent of the time usually consumed on making deposits and 70 percent of the time usually consumed on making withdrawals. The amount of money that was still in the bank after deposits and repayments of loans were moved from a bank officer to a mobile phone for all three jobs resulted in a decrease in the total amount of money. Even if it is available, the application of technology that saves time may not always be beneficial for the provision of financial services.

Transaction Cost

Despite the fact that digitization has the capacity to minimize the cost of financial services, the actual cost of DFS will be determined by the laws and regulations in each individual jurisdiction. Because of the value that women place on DFS savings and the control they have over them, cost reductions could be leveraged to increase WEE. However, it is unclear whether or not women have control over their prospective savings (Pazarbasioglu et al., 2020). For example, Schaner (2017) discovered that women chose the more expensive alternative in Kenya, where ATM cards

lowered withdrawal rates in half, because it allowed them to keep control over their money. Female savers have reported feeling a higher sense of helplessness in relation to the management of their own finances as a direct result of the widespread availability of ATM cards. when compared to the group serving as the control, which did not experience any loss of control. An experiment was conducted in which the transaction costs for mobile linked deposit services were altered. This experiment was carried out by researchers from De Mel et al., (2022). According to the findings of the study, female bank account holders in Sri Lanka responded to transaction fees by increasing their overall savings. This was proven to be the case. Specifically, they were responsive to the amount of money that they saved. These diverse findings indicate that DFS's cost benefits might have a very context-dependent influence on WEE.

Mobility

The idea that DFS could facilitate remote transactions, hence reducing the need for women to travel, is an intriguing one that has received little academic attention. DFS may be able to increase women's mobility, another desirable development, by normalizing women's involvement in financial institutions. This would be a positive development. According to Mothobi and Grzybowski (2017), the use of evening light intensity as a surrogate for physical infrastructure in sub-Saharan Africa enables people to access financial services who otherwise would not be able to do so. This is the conclusion reached by the authors after conducting research in the region. Because most people now have mobile phones, they are able to do this. This is an excellent illustration of how DFS, like mobile money, may help people

access financial services despite their physical limitations. There is no apparent evidence that DFS steers a different role in decreasing this constraint for men and women. This is despite the fact that physical mobility is probable to be a more restricting hindrance for women than for males (owing to societal norms and time restrictions).

Murshid, Khandker, Ali, Samad and Hussain (2020) conducted a study in Bangladesh to investigate the accessibility of the bKash mobile money services by utilizing the distance to financial services agents as a parameter. According to the findings of the study, one of the most important factors that determined how much freedom women had to move around and other aspects of their empowerment was the distance between two different locations. As proxies for mobility, they employ a number of measures, such as the ability to visit marketplaces, banks, relatives, and friends. rather than as a direct result of DFS, as addressed in this study. It is included in the mechanism section because of its significance in the ongoing research as well as the methodological insights that were learned from an earlier analysis of this mechanism or the findings that it produced in previous work.

Factors that influence the use of digital financial services

According to Munir, Idrus, Kadir and Jusni (2013), people in Makassar Ci accepted mobile banking services because of their opinions of the services' usability and benefits. This examination took place in Makassar Ci, which was the location of the site. A recent study found that consumers are more likely to use mobile banking services if they perceive those services to be straightforward and straightforward to use. When making a purchase

decision, it was discovered that perceived utility was a more important factor than the ease of using the product.

Sayid, Echchabi and Echchabi (2012) used the TAM to conduct a study in Somalia on the use of mobile financial services. Security, supposed risk, and social effect were among them, with perceived utility and social impact being the only major elements driving the uptake of mobile financial services. However, their findings on perceived ease of use were at odds with the findings of several research based on TAM, which have demonstrated that TAM has a major impact on adoption (Dass & Pal, 2011).

Research into Vietnamese clients' intentions to use internet banking services was conducted using the TAM and the TPB. Online banking usage is influenced by a wide range of elements, according to the study's findings, including people's judgments of the convenience, usefulness, legitimacy, and control they feel they have over the process. Consumer behaviour and the willingness of customers to adopt mobile banking applications were studied in South Africa by Balabanoff (2014). A number of elements, including attitudes, subjective standards, and perceived control behaviour, have been demonstrated to influence people's willingness to utilize mobile banking apps. According to the findings of the TPB study, women's successful use of DFS is influenced by their attitudes, subjective norms, and perceptions of control behaviour.

Dass and Pal (2011) investigated the factors that impact rural Indians who are underbanked from utilizing mobile financial services. They did this by utilizing TAM to conduct their research. The demand for financial services, obstacles to traditional banking channels, perceived utility, trust, technological

readiness, simplicity of use, and perceived financial cost are the seven components that make up Mobile Financial Services (MFS). Lack of confidence, financial expenditure, and technology have all been recognized as major barriers to rural unbanked people using mobile banking services.

Hu, Ding, Li, Chen and Yang (2019) conducted research in Heibei, China, to investigate the likelihood that 387 active clients of a commercial bank will use financial technology services. When the data were analysed with the structural equation model, it was discovered that customers' levels of trust in the various FinTech services have a substantial impact on their perspectives regarding adoption. In addition, the findings of the TAM demonstrated that users' opinions towards the adoption of fintech are not significantly influenced by their impressions of the ease of use or the perceived danger posed by the technology. A study conducted in Taiwan by Chuang, Liu and Kao (2016) perceived utility is the most influential element that influences consumer attitudes toward Fintech services positively.

Jünger and Mietzner (2020) say that Using data from a survey of 323 German households. Jünger and Mietzner (2020) analysed the likelihood that households will move on from traditional banks to Fintech firms. In addition, the survey aimed to find out what influences households' likelihood of substituting traditional banks to Fintech companies. According to the survey, 31 percent of households are open to using a Fintech company instead of their current bank. In light of this, Fintech businesses have the potential to take market share away from traditional financial institutions. Financial literacy, transparency, trust, and comfort with a new system all play a role in families' desire to move on to a FinTech company, according to the results of the

survey. In particular, households with low levels of trust and a penchant for transparency are more likely to adopt Fintech, whereas German households' perceptions of pricing are not statistically significant enough to affect their willingness to change.

Kim (2022) explored how customers in Seoul embraced payment-type Fintech services by using the Elaboration Likelihood Model (ELM) and the Technology Acceptance Model. According to the data, there was a correlation between usefulness, ease of use, and credibility having a favourable impact on the intention to use the product. In the meantime, it was determined that self-efficacy has a positive influence on intention to use, while privacy concerns were discovered to be a negative component that stands in the way of the road leading to intention to use. According to the findings, ease and utility are the most important aspects that could encourage Seoul residents to utilize payment-type Fintech services.

Bergmann and Macada (2019) conducted research in Brazil to study the connection between the adoption of fintech and the end-users' intentions to remain customers. According to the findings, there is a connection between users' continuation intention and trust, perceived advantages, security risk, and financial risk; however, there is no connection between users' continuation intention and operational risk. Lee, Hong and Min (2018) conducted a survey of 224 people who use Bitcoin in order to study the elements that determine Bitcoin's acceptability in Korea. Using the PLS approach, an expanded TAM model was presented and evaluated with an online survey sample. The study found that a person's choice to accept Bitcoin was heavily influenced by their

perceptions of security and utility. Meanwhile, perceived ease of use has an indirect influence on the intention but has no significant direct impact.

Using TAM and the Unified Theory of Acceptance and Use of Technology, Kaur et al., (2021) looked at the factors that influence Fintech adoption in Malaysia among 300 respondents of all ages (UTAUT). According to the findings of the study, the propensity to adopt fintech in Malaysia is influenced by a number of factors, including personal innovation, perceived usefulness, societal effect, perceived ease of use, security concerns, perceived enjoyment, and demographic attributes. Furthermore, the gender perception result revealed that males in Malaysia are more likely than females to adopt Fintech.

Hu et al., (2019) conducted research on 387 active clients of a commercial bank in the province of Hebei in China. When the data were analysed with the structural equation model, it was discovered that customers' levels of trust in the various FinTech services have a substantial impact on their perspectives regarding adoption. The findings of TAM also demonstrated that users' perceptions of the ease of use and threat posed by Fintech had little effect on their opinions regarding the adoption of Fintech. According to a study conducted in Taiwan by Chuang et al., (2016), perceived utility is the most influential element that influences consumer attitudes toward Fintech services positively.

Effect of digital financial services on women economic empowerment

According to a number of studies that were conducted not too long ago, the usage of mobile money has a beneficial effect on the capacity of homes to deal with monetary challenges, primarily because of an upsurge in

social support networks (Blumenstock et al., 2016; Lee et al., 2018; Riley, 2018; Batista &Vicente, 2020). Jack and Suri (2011) discovered that having access to mobile money increased the tendency of receiving informal transfers of money, as well as the amount of money transferred and the number of sources from which money could be obtained. In addition, having access to mobile money increased the number of sources from which money could be obtained. According to the findings of Blumenstock et al., (2016), people in Rwanda used data on mobile phone usage in the aftermath of semi-random natural catastrophes to make calls and transfer airtime to persons in the impacted region. Mobile money was the primary focus of these trials because it represented a potential way by which digital financial services could be provided. According to the findings of this research, there has not been a connection made between the economic empowerment of women and the provision of digital financial services.

Holloway et al., (2017) did a study on women's economic empowerment through financial inclusion and discovered that financial service providers and other stakeholders may use proper product design elements to overcome some of these barriers to women's financial inclusion. Riley (2018), on the other hand, compared families in Tanzania with and without access to mobile money to determine the influence of mobile money on consumption following rainfall shocks. According to their findings, the efficiency of transfer and informal risk sharing were greatly influenced.

There was a bargain of the influence of female autonomy on female labour supply in the case of Chloé van Biljon, Dieter von Fintel & Atika Pasha (2018) study. They utilized a bank card rollout for a cash distribution scheme

in South Africa to assess the impact of women's autonomy on labour supply. According to the study, becoming a key decision-maker enhances a woman's chance of engaging in the labour market by 92 percentage points. Altogether, these previous studies provide support for the need of digital financial services in respect to financial institutions, financial inclusion, and poverty. However, in lieu of digital financial services, it is vital to know the relationship between digital financial services on some socio-economic correlates and also, its effect women economic empowerment.

Sultana, Guimbretière, Sengers and Dell (2018) investigates the potential and challenges that arise when building technologies to assist Bangladesh's low-income rural women. The study exposes systemic everyday issues that women confront in a qualitative, empirical study with 90 participants, which serve as the backdrop against which technology design could potentially take place. They talked about how technology is already affecting women's lives, sometimes by confirming their submissive status in society, and sometimes by allowing women to gain a measure of agency through tactical use of technology. However, the study failed to look at how the use of DFS can influence WEE.

The study by Cabeza-García, Del Brio and Oscanoa-Victorio (2019) explores the effects of equitable economic development on female financial inclusion. On 91 nations, including both developed and emerging economies, an instrumental variable analysis is performed utilizing data from the Global Findex 2015 database as well as the World Bank DataBank. This study is based on a small number of nations and their populations. Women's access to bank accounts and credit cards has a favourable impact on economic growth,

according to the data. Despite the fact that the study looked at female credit card use, it did not consider how it affects women economic empowerment.

Mustafa et al., (2019) examine how digital financial services might help women in communities where patriarchy is strong but resources are limited. They found that this approach works. They do this by concentrating on underserved neighbourhoods. They were particularly interested in finding out how DFS may be used to make it simpler for women to get a loan. Women who run microbusinesses in Pakistan's various cities are being tracked and their difficulties are being examined in a qualitative and empirical study now taking place. Mobile money does not meet these women's concerns or the needs of their finances in the same manner that technology is affecting their career and personal life. People are now able to pay their energy bills, acquire services, save money, and transfer money using their mobile phones thanks to applications such as M-Pesa. In addition, M-Pesa can be used to make purchases of various goods. M-Pesa, which operates out of Kenya and has over 27 million customers signed up for its services, is one of the most frequently referenced examples of a distributed financial system that has been successful. Through the use of M-Pesa, women now have the power to exercise greater control over the remittances and other funds that are sent to their families from other countries (Jack & Suri, 2011).

Batista and Vicente (2020) experimented with rural Africa's adoption of mobile money by establishing mobile money operators and disseminating information about mobile money services. They discovered that homes having such services were mostly able to spend due to payment receipts. However,

the majority of these research failed to demonstrate that employing DFS to boost WEE has any effect.

Soekarno and Setiawati (2020) analysed the gender component of digital financial inclusion in Indonesia, an exciting market. They linked women and digital financial inclusion through surveys. One of the key variables, gender, was modelled using the ordinal logistic regression model. The findings revealed that women, as the gender in question, had a considerable impact on behavioural intentions associated with digital financial inclusion. However, they failed to examine how the usage of DFS has an effect WEE.

Kenyans' use of mobile money data was used in Kipchumba and Sulaiman's (2021) research on digital finance and intra-household decision-making in Kenya. In this study, data from the Kenya Financial Inclusion Insights survey, done in 2016, and the Fin Access geospatial mapping, conducted in 2015, are used to examine how mobile money usage affects household decision-making. Mobile money gives both men and women greater control over their personal financial situations, according to the experts. The changes in decision-making in the home do not follow immediately from this adjustment, according to their explanation.

Chapter Summary

The substantive amount of literature reviewed of about 43 articles, 22 journals, 5 reports and 5 sites have given a fair idea on the subject matter in consideration of the year of publication. In the above review, the dominant theories employed were the technology acceptance model. 85 percent of the papers reviewed used survey data collected from questionnaires and the

research was mainly conducted in Eastern and Southern Africa with a few from European countries. In sum, from the theoretical perspectives discussed coupled with the empirical studies, it is clear that the adoption of digital financial services (DFS) among women has an influence on their economic empowerment. Nevertheless, the relevance of digital financial services and women economic empowerment in Ghana remains largely unknown. To fill this gap, the current study distinguishes itself by examining the effect DFS on women economic empowerment in Ghana.

CHAPTER FOUR

RESEARCH METHODS

Introduction

This chapter described the research design, the data source, and the model specification for estimating the data. The definition of the variables used in the model were also presented and finally the summary of the chapter.

Research Design

The study employed the positivistic research paradigm. The viewpoint held by the positivist is that reality can be observed, and once it has reached a stable state, it would be objectively characterized and measured without being influenced by the occurrences that are being investigated (Levin, 1991). An inferential and analytical research method was conducted in order to provide economic meaning and intuition to the phenomenon been studied and provide the opportunity to do a comparative analysis. Analytical research is very important in these kinds of research where the data collected are of quantitative in nature and from secondary sources.

The distribution of variables for the study were described in terms of their frequencies, percentages, mean, standard deviation, minimum and maximum values as well as the kurtosis. The distribution about the mean value represents the average value of each variable. The value of the standard deviation distribution measures how close or dispersed the observations are from the mean. Whereas the minimum and maximum values give a range of values from the smallest to the largest number. The skewness and kurtosis represent the steepness or flatness of the values of the distribution and the degree of asymmetry of the values in of the distribution respectfully.

Correlation analysis among the variables was done to see the relationship between the variables.

In terms of the first objective, a cross tabulation was computed for the relationship between DFS and socio-economic correlates among women in Ghana. The chi square was adopted to further test the significance of the correlation that exist between DFS and the socio-economic correlates among women. The structural equation model (SEM) was also employed to take care of the second and third objective on the determinants of DFS and the effect of DFS on WEE. The study used quantitative research strategy which is in adherence with the positivist philosophy. As a result, it is important to adopt a research design that is both acceptable for the quantitative nature of the study and suitable for a cross-sectional analysis that occurs at a certain point in time (Litvin, 2008).

Data Type and Sources

The study employed cross-sectional secondary data from the Ghana Living Standard Survey (GLSS 7), which was conducted in 2016/2017 by the Ghana Statistical Service (GSS). With a two-stage probability sampling technique the survey data was collected on a wide range of topics, including demography, housing conditions, labour market conditions, education, water and sanitation, health, access to financial and insurance services, remittances and household assets, disability, migration, agriculture, non-farm activities, and governance. 15,000 households spread across 1000 clusters of enumeration areas across Ghana's ten regions were surveyed. This survey was successful with a response rate of 93.4 percent. After interviewing 14,009 households, the final sample size of determined. On the other hand, on the

individual basis, it is made up of 59,864 individuals. Several sections of the survey were combined resulting in a reduction in the sample size to 11,308 individuals. This was due to the absence of observations for some individuals in one or more files.

Estimation Techniques

Pearson chi square test

The correlation between two categorical variables is determined with the chi square statistics ($\mathcal{X}^2$). It is employed in a cross tabulation or bivariate tests to typically evaluate the test of independence. The crosstabulation illustrates the distributions of two categorical variables concurrently, with the intersection points being the intersections of the categories of the variables. The test of independence compares the observed responses of the categorical variables to the responses that would be predicted if they were truly independent of one another. It is necessary to calculate the chi square statistic and compare it to a critical value in order to determine whether the observed variables are statistically substantially different from the expected variables. To determine the relationship between DFS and socio-economic correlates among women, the Pearson chi square statistic test was used together with the crosstabulation distributive graph to make a statistical decision.

Structural equation modelling

The Structural Equation Model (SEM) is one of the complex versions of multivariate regression models. It is a statistical technique that integrates elements of traditional multivariate models, such as regression analysis, factor analysis, and simultaneous equation modelling to create a more robust model. A typical multivariate linear model does not allow the response variable to be

used as a predictor in another regression equation in SEM unlike the standard multivariate linear model. When using SEM, the variables can have an impact on other variables either directly or indirectly via intermediates such as additional variables (Fox, 2002). The first stage in developing a SEM model, is the preparation of path diagram or illustration of the hypothesised model based on existing knowledge and/or theories. SEM is a multivariate statistical analytical technique that incorporates several distinct multivariate statistical analytical approaches into a single model fitting framework. Using many indicators, it measures latent or unobserved constructs in order to infer their structural relationships.

Circles and ovals are widely used in path diagrams to depict unobserved or latent structures defined by measured variables, although rectangles are more commonly used to represent observable variables in the path diagrams. Double-headed arrows demonstrate correlations between variables, in which one variable has an indirect impact on another. Unidirectional arrows show causal routes showing a direct influence of variables on each other (McDonald & Rowsell-Jones, 2012). The method of choice for parameter estimate in most cases is the maximum likelihood estimator. The Generalized Least Square (GLS), Weighted Least Square (WLS) and Asymptotically Distribution Free (ADF), however are other estimation approaches used (Lei & Wu, 2007; Hooper, Coughlan & Mullen, 2008). The general equation for estimating SEM is specified as:

$$X = \delta + \beta x + e \quad (1)$$

$$Y = \gamma + \theta y + e \quad (2)$$

$$Y = \propto + \eta X + \omega Z + \varepsilon \quad (3)$$

where x, y and Z represents observed exogenous variables, Y denote Latent endogenous, X denotes Latent exogenous, e represent errors for the observed exogenous variables, ε denote error for observed latent endogenous variables, $\delta, \delta\ and\ \propto$ denotes intercept, and β, θ, η denote coefficients.

It is necessary to test both the measurement model and the structural model in SEM. Chi-Square ($\mathcal{X}^2$), Root Mean Square Error of Approximation (RMSEA), Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Comparative Fit Index (CFI), Normed Fit Index (NFI), and Non-Normed Fit Index (NNFI) or also known as Tucker- Lewis Index (TLI) are some of the often-used GoF methods used to ascertain whether or not the model fits the sample data. Several measures of the GoF are altered as a result of the sample size. (Marsh, Balla & McDonald, 1988; Rocha & Chelladurai, 2012), as well as the data distribution (Schermelleh-engel et al., 2003).

SEM was used to investigate the determinants of DFS as well as examine the effect of digital financial services on women economic empowerment. The decision to use DFS cannot be observed directly but determined by one or more explanatory variables hence digital DFS is captured as a latent variable in the SEM. This was also true for WEE which is also captured as a latent variable. The maximum likelihood estimation was carried out to estimate the direct effect of DFS on WEE in the SEM model.

Model Specification

As a result of their inability to sell their labour on the open market due to their lower earnings than males, women are said to be more likely to remain restricted to the home. According to this argument, earnings for women should be at least as high as those for males in order to achieve gender parity. The

research focuses a significant amount of attention on this theory. Therefore, the effect of DFS on WEE as a result of the direct effect of the use of DFS on their income level, work hours and autonomy based on their use of DFS. Based on this theory, the effect of DFS on WEE, is on the basis of recognition-redistribution dimensions in term of education, ICT skills, age, marital status, residence, use of internet, household size and household head associated with women's usage of digital financial services. It is not uncommon for women to enter the workforce in order to provide a supply of labour that can be called upon on a daily, weekly, seasonal, or part-time basis to meet the requirements of the economy. This type of labour can be requested on any of these intervals (Loutfi 2001). Part-time or full-time employment is an option. In Ghana, women who participate in the labour market and use DFS get to have more autonomy on what they use their payments for. The use of DFS also increases their work hours by saving more time to spend on their works and hence an increase in their income. Therefore, the economic empowerment of women is directly affected by their labour market participation and other factors such as education.

Based on the empirical works of (Bergmann & Maçada, 2019; Chong et al., 2019; Hu et al., 2019, Lee et al., 2018; Dass & Pal 2011), the model blueprint for this research is specified in Figure 1. The framework summarises the endogenous and exogenous latent variables, DFS and WEE and their respective indicators ATM, E-zwich, E-banking, and Momo and income level, autonomy, and hours work respectively.

The variables in Figure 1; household head, household size, education, marital status, use internet, residence, age and ICT skills are the observed

exogenous variables that have been used to draw the paths linking DFS to WEE. In the framework, the error terms of the observed variables, income level and hours work have been correlated based on the correlation between the variables. This means that, the number of hours a woman works determines the amount she earns in terms of her income.

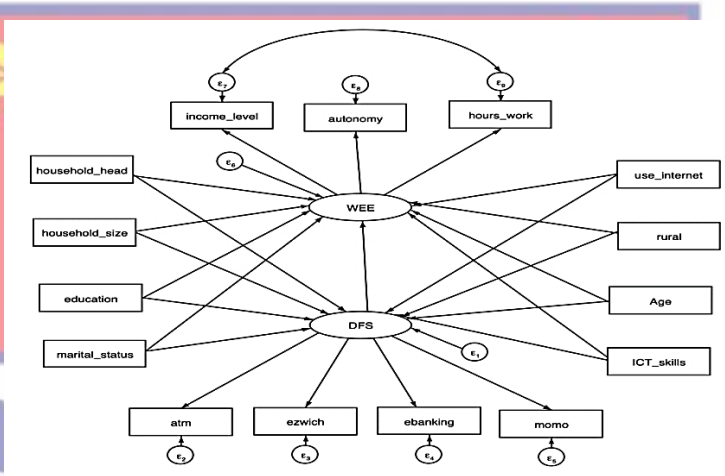

Figure 1: Structural Model Framework
Source: Appeynarh (2021)

Variable Description and Expected Sign

This section outlined the variables' operational definitions and the methods used to assess them.

Digital financial services

From the data set used, four variables were used to measure the latent independent variable DFS: ATM, E-zwich, E-banking and Momo. The questions had a response of Yes/No, making it a dummy variable. The codes of Yes (1) and No (0) for using any of these four types of DFS and not using DFS respectively.

Women economic empowerment

The dependent variable women economic empowerment in this study is defined as the ability of a woman to make her own decision, working for a

wage and the total hours of work done by the woman. Onebunne and Ezeaka (2020) asserts that use and influence over productive capital, quality jobs, control over earnings, as well as increased voice, agency and active involvement in economic decision making at all levels can make women economically empowered. In the study, women economic empowerment has been measured as a latent variable, having its indicators as binary. Thus, the income level (high/low), autonomy (Yes/No) and hours work (full time/ part time) have been used to measure women economic empowerment for this study.

Income level

The income level indicates how much a woman is paid for the job she is doing. In this study, a woman who earns Gh₵8.8 and below per day is considered to have a lower level of income. Whiles a woman who earns above Gh₵8.8 is considered to have a higher income level. This is in line with the 2017 minimum wage rate of Gh₵8.8. The responses have been coded with 0 and 1 for low and high levels respectively.

Autonomy

Autonomy refers to the decision-making power or ability by oneself. It is described as who mainly decides on the use of payment received in this study. This is a form of decision-making power on the side of the woman that is, if she mainly makes the decision on how the payment, she receives be spent by herself. This was coded with 1 if she has autonomy and 0 for if she does not have autonomy.

Hours of work

Hours of work is the total number of hours per month spent on tone's economic activity. In this study, it refers to the total number of hours per week that a woman spends altogether on the job she is doing. This was coded with 0 as part time and 1 for full time. The part-time extends from 0 to 39.9 hours whereas the full-time constitute the hours of work exceeding 40 hours per week according to GSS (2010).

Use Internet

This is also another control variable for the study which is a dummy variable indicating the use of internet by a woman. DFS is alternatively used through electronic devices with the support of internet. The channels (computer, mobile phone) through which the service is rendered sometimes use internet for the transaction especially in the case of E-banking. This variable indicates whether or not a woman has used internet. It is also captured as 1 for using internet and 0 for not using internet.

ICT skills

The observed variable for this study Information Communication technology is an effective medium through which a woman can effectively use DFS. it is the ability of a woman to perform basic functions with electronic devices such as the devices through which DFS are being rendered. Once a woman has the ability to use these devices or navigate through the features, it is easier for her to use the service in making financial transactions digitally. Kawaljeet and Jaswinder (2015) in their study show that, ICT is a good infrastructure in driving the growth for financial inclusion since it increases the chances of using an electronic device than merely owning it. It is a dummy

variable asking whether name has ICT skills and has been captured with a value of 1 for Yes and 0 for No.

Education

The education of women steers a specific part in the use of digital financial services to enhance her economic empowerment. Due to the difficulty of navigating via phone menus, which are typically written in English, previous studies have identified literacy as a factor in mobile phone information access utilization (Okello, Al-Hassan & Okello, 2010). The codes of 1 for Yes and 0 for No have been used to code the education of a woman. Those with a higher level of education will receive a positive indicator, whereas those with a lower level would notice a negative one. Woman who are educated are more probable to have knowledge and use DFS more effectively and hence improving on their economic empowerment than those who are not educated.

Age

Age is the number in years of a person. In this study, age denotes the age of a woman who is 15 years and above. This is in line with the (PHC, 2021) labour force age criteria. Either a positive or negative indicator is to be anticipated. Age influences the likelihood of adopting DFS, and there is a cut-off point after which consumption and income can go up or down. Age also has an effect on the likelihood of utilizing DFS. The user's age is a significant factor in identifying their use of DFS.

Household size

The size of a household is the amount of people that make up a household and feed from the same pot.

Marital status

Marital status refers to whether or not a woman is married. The codes of 0 for unmarried and 1 for married were used. Women who are married are more likely to use DFS for transactions in sending and receiving funds to and from their partners. Also, married women can intensify their wealth and productivity than those who are unmarried as a result of the additional support from spouses or joint contribution for other financial transactions.

Rural

This refers to the exact location of a woman in terms of rural or urban areas. It was given a code of 0 for urban and 1 for rural. The type of residence of women can easily affect their use of DFS as well as enhancement in their economic empowerment. For the purpose of increasing women's economic empowerment DFS is substantially less common in rural areas than in urban areas.

Region

The region has been defined according to year in which the data was collected. In 2017, there were 10 administrative regions in Ghana. The various regions of women can affect their economic empowerment. This is based on the dominant economic activities that take place in the regions. The characteristics of the regions may induce the use of digital financial services and consequently enhance women economic empowerment.

An overview of the research's statistical findings is provided in Table 1, along with their expected signs.

Table 1: Variable Description and Expected Sign

Variable Name	Description	Type of variable	Expected sign DFS	Expected sign WEE
Digital Financial Services ATM E-zwich E-banking Mobile money	DFS include a broad range of financial services accessed and delivered through digital channels, including ATM's, E-zwich, E-banking, mobile banking etc	**Latent** ATM (1=Yes 0=No) Ezwich (1= Yes 0=No) E-banking (1=Yes 0=No) Momo (1=Yes 0=No)	Positive	
Women Economic Empowerment Autonomy Work hours Income level	Women Economic empowerment is the ability of the woman to have autonomy, work more hours (full time) and earn an income.	**Latent** Autonomy (1=Yes 0=No), Income level (1=high income 0=low income), Hours Worked (0 = part time 1= full time)		
Age	Age of a woman in years.	**Continuous**	Positive/Negative	Positive/Negative
Household size	Number of individuals in the household size.	**Continuous**	Positive/Negative	Positive/Negative
Household head	Whether the woman is a household head or not.	**Dichotomous** No=0, Yes=1	Positive/Negative	Positive/Negative

Table 1 (continued)

Residence	Residence refers to the exact location of a woman in terms of rural or urban areas.	**Dichotomous** Urban=0 (base), Rural=1	Positive/Negative	Positive/Negative
Use internet	This indicates whether or not the woman use internet.	**Dichotomous** No=0, Yes=1	Positive/Negative	Positive/Negative
ICT Skills	Whether or not the woman has the ability of a woman to perform basic functions with electronic devices.	**Dichotomous** No=0, Yes=1	Positive/Negative	Positive/Negative
Marital status	It refers to whether or not a woman is married.	**Categorical** Married=1, Never Married=0	Positive/Negative	Positive/Negative
Education	Whether the woman is educated or not.	No=0, Yes=1	Positive/Negative	Positive/Negative
Region	Part of a country in which the woman resides.	**Categorical** Western, Central, Greater Accra, Volta, Eastern, Ashanti, Brong Ahafo, Northern, Upper East, Upper West	Positive/Negative	Positive/Negative

Source: Appeynarh (2021)

Chapter Summary

In this chapter, extensive detail was provided regarding the methodology that was followed when conducting the data analysis for the research. The methodology of the study was outlined. The positivist method of conducting research won out in the end. The data source and typed were then described. The study used distribution analysis together with a chi square statistic to confirm the correlation between the dependent and independent variable and also used the structural equation model (maximum likelihood estimation) for the estimation of the determinants of DFS as well as the effect of DFS on WEE to achieve the purpose of the research.

CHAPTER FIVE

RESULTS AND DISCUSSION

Introduction

In this portion of the research, the findings were analysed, and a discussion of those findings is offered. We might get a clearer comprehension of the values and the direction of the correlation between the variables with the use tables and figures. The chapter was organised into the summary statistics and correlation of the variables used for the study and presents detailed results of the relationship between the use of individual DFS socio-economic correlates among women in Ghana. These distribution analyses were presented in figures. Also, the determinants of DFS as well as the effect of DFS on WEE were presented by the structural equation model for both the measurement and structural models. The goodness of fit of the models were tested as well.

Descriptive Statistics

The summary statistics of all the categorical variables used in the study is presented in Table 2. The total sample size deployed for the research is 11,308 women. In this study, a woman's economic empowerment to some extent is defined by her ability to have autonomy, spend more time during her work hours and have a high-income level. Autonomy, hours of work and income level are therefore the proxy measures of WEE in this study. From the data, 91 percent of women in Ghana are low-income earners whereas the remaining 9 percent are high income earners. This means that, a larger percentage of women have their income levels below the minimum wage rate per day.

Table 2: Summary Statistics of Categorical Variables

Variables	Categories	Frequency	Percentages
Income level	Low income	10,290	91.00
	High income	1018	9.00
Autonomy	No	9,841	87.03
	Yes	1,467	12.97
Hours of work	Part time	7,305	64.60
	Full time	4,003	35.40
ATM	No	10,652	94.20
	Yes	656	5.80
E-zwich	No	11,232	99.33
	Yes	76	0.67
E-banking	No	11,239	99.39
	Yes	69	0.61
Mobile money	No	10,137	89.64
	Yes	1,171	10.36
Use of internet	No	9884	87.41
	Yes	1424	12.59
ICT skills	No	10320	91.26
	Yes	988	8.74
Education	No	3879	34.30
	Yes	7429	65.70
Household head	No	8,193	72.45
	Yes	3,115	27.55
Marital status	Not married	4577	40.48
	Married	6731	59.52
Rural	Urban	4173	36.90
	Rural	7135	63.10
Region	Western	999	8.83
	Central	1067	9.44
	Greater Accra	981	8.68
	Volta	1284	11.35
	Eastern	1070	9.46
	Ashanti	1112	9.83
	Brong Ahafo	1075	9.51
	Northern	1373	12.14
	Upper East	1338	11.83
	Upper West	1009	8.92
Total		**11,308**	**100**

Source: Appeynarh (2021)

A woman with autonomy is one who has a decision-making power. Thus, is able to mainly decide on how the payment she receives should be spent and also how to make other transactions and purchases without having to take permission or consent from either her spouse or anyone. In Ghana, it can be seen from the data that, most of the women do not have autonomy and they represent 87.03 percent of the sample.

In terms of working hours, a woman either works part time or full-time. About 64.60 percent of these women are part time workers. In this regard, it can be seen that, by the measure of economic empowerment of women, a higher percentage of them may not be economically empowered.

The use of ATM among the women in Ghana is low. It is seen from Table 2 that, about 94.20 percent of these women are not using ATM. The use of E-zwich reflects the same situation and even at a lower percentage of use by 0.67 percent. Form the distribution of the data, it was shown that, about 99.39 percent of women are not using E-banking. About 10.3 percent of the sample women use mobile money. This therefore makes mobile money the commonest types of DFS among the sample women in Ghana. That is to say that, in comparing the four types of DFS, even though a higher percentage of women do not use them, mobile money is used more among the women in the sample. Mobile money has aided women to benefit from instant financial services in the form of payment and remittances and it has been a means of saving money safely by women with lower incomes (Kim, 2022).

A higher percentage (87.41) of women in Ghana do not use internet. On the other hand, only a few of them 12.59 percent of them use internet. This goes by far to explain their poor use in some of the types of DFS mentioned. ICT skills is also one of the major drives of the use of DFS. However, the use of ICT is low among the women in Ghana. According to the distribution of the dataset, 91.26 percent of women do not have ICT skills. This reiterates the fact that, majority of the women do not effectively use DFS. This is because, without ICT skills, it would be difficult for them to operate and navigate through the electronic devices in rendering DFS.

The education refers to whether or not the woman has ever attended school. This shows if the woman is educated or uneducated. From the result, about 34.30 percent of the women are uneducated. This shows that, more than half of the women are educated.

Women found to be household heads were just a few. The distribution in Table 2 indicates that, only 27.55 percent of these women are household heads. This gives the indication that majority of these women are not heads of the households to which they belong. The marital status of these women also shows that, almost half of them, representing 40.48 percent, are not married.

The rural variable explains the location of the woman in terms of residence. It was shown that, only 36.90 percent of the women reside in the urban areas. This proves that majority of the women in the data distribution for this study are rural women. Women are more probable than men to be found in rural areas across Sub-Saharan Africa, which is not shocking given the low participation of females in the salaried labour force across the continent. It is known that men occasionally migrate to the urban centres in search for greener pastures. For example, A study conducted in Ghana by Abraham, Ohemeng and Ohemeng (2017) confirms that, the rural urban residence of women is associated to their labour force participation. The study reveals that, women and especially those with children are less likely to move to urban areas for formal employment but rather engage in informal economic activities in the rural areas and are usually out of choices for employment owning to the need to cater for their families. Also, in Romeo, Manuelli, Geringer and Barchiesi (2021), it was elaborated that men leave their wives and children behind in

their native villages to work in mines in Zambia, which is a significant source of internal migration.

The summary statistics in Table 3 describes all the continuous variables used in the study. There is an emphasis on the values of the distribution of the mean, standard deviation, minimum and maximum values, skewness, and kurtosis for the dataset in Ghana.

Table 3: Summary Statistics of Continuous Variables

Variable	Obs.	Mean	Std.Dev.	Min	Max	Skewness	Kurtosis
Household size	11308	5.660	3.444	1	28	1.661	7.868
Age	11308	38.723	15.349	15	99	0.587	2.800

Source: Appeynarh (2021)

For a sample size of 11,308 women across the distribution, it is deduced that, the average household size is 5.660 with a variation of 3.444 indicating the mean and standard deviations. The minimum household size is made of 1 person and a maximum of 28 people. This is a positively skewed distribution and comes across as a leptokurtic with greater values above the sample mean.

The age of women for this study has a mean of 38.723 with a 15.349 variation from the average age. The minimum age is 15 years and the maximum is 99 years. This is due to the age criteria of interest for this study.

Relationship between Digital Financial Services and Socio-economic Correlates among Women

To determine the relationship between DFS and socio-economic correlates among women in Ghana, the study considered a distribution of DFS usage per the socio-economic correlate (education, autonomy, ICT skills, residence and region) of women.

Distributive analysis of DFS by socio-economic correlates

The distribution of the use of individual DFS (ATM, E-zwich, E-banking and mobile money) by education is shown in Figure 2. Education is an indicator of socio-economic correlate (IFC, 2021) measures if the woman is educated or uneducated. Women education and the use of ATMs are positively associated. Almost all the women who use ATM have some form of education at 98.17 percent more than the 1.83 percent of women who are not educated. This explains that, the more educated a woman is, the more her chances of using ATM as compared to a woman who is uneducated. In Ghana, the use of ATM services is associated with some form technical and computerized features of which one needs to be educated on before use. Most of the people who use these services have some form of education as compared to those who do not have any form of education at all. The chi square results of 325.873 (P-value = 0.000) concludes a significant positive relationship between the use of ATM and women education.

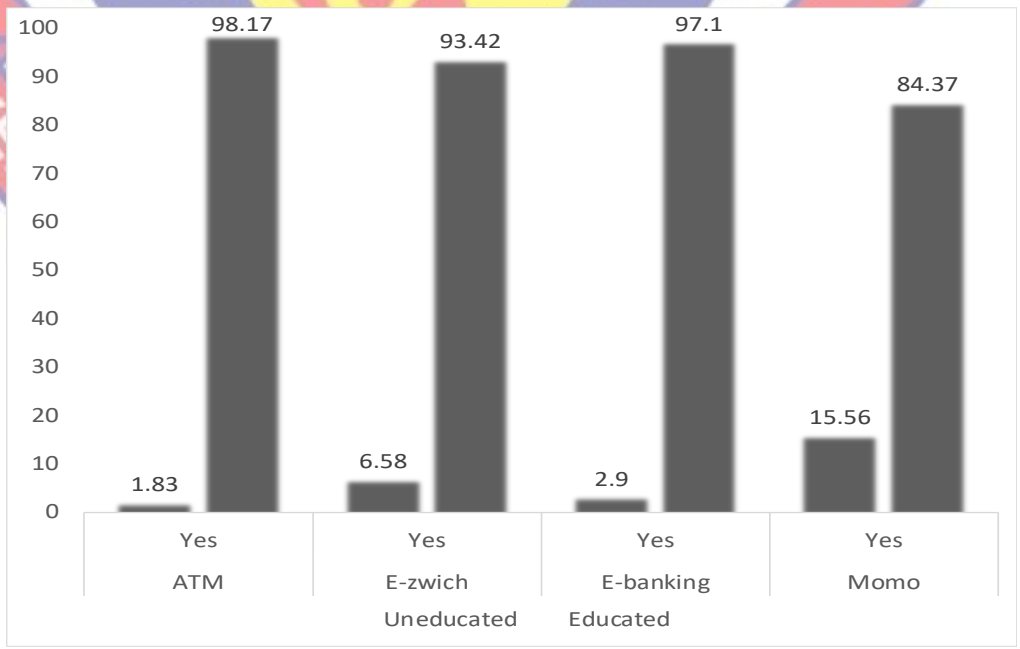

Figure 2: DFS and Education
Source: Appeynarh (2021)

The use of E-zwich and the education of women have positive relationship. E-zwich is a mandatory means of national service allowance withdrawal of service personnel in Ghana. This means that, most people who use the E-zwich service are educated than those who are not educated. Thus, the results show that, the use of E-zwich by women with education is 93.42 percent more than those who do not have of about 6.58 percent. From the chi square results, we conclude that, there is a significant relationship between the use of E-zwich and women education at a chi square value of 26.097 (P-value = 0.000).

Furthermore, E-banking, an electronic banking which is done online is used more among those who are educated than those who are not educated at a percentage of (97.1 and 2.9) respectively. This makes it evident that, for electronic banking, it is unlikely for those who are uneducated to patronize. Unlike the people who are educated, the use of electronic services in not very conversant among people without any form of education since they will not have any literal understanding of how the services work or even how to go about it basically. However, those who are educated patronize this service more because of the advantages of the E-banking over the traditional banking system, hence the fair distribution of the educated women using the service more than those who are uneducated. This contradicts to a study by Boden (2013), on electronic payment in Ghana, revealing that, Ghanaian women feel reluctant to receive payment via electronic means due to a lack of knowledge regarding the usage of electronic payment methods. The chi square results 30.812 (P-value = 0.000) concludes a significant relationship between the use of E-banking and women education.

In Ghana, mobile money is one of the DFS service mostly used and has proliferated across all the telecommunication networks. These are the likes of MTN Momo, Vodafone cash, Tigo Cash, and Airtel money. Also, there are the bank systems SSD and the interoperability. In terms of the use of this service, both the educated and uneducated use it, however, the results in Figure 2 distinguishes the percentage of uneducated and educated women using the Momo services at 15.56 and 84.37 percent respectively. This means that, though the mobile money service is easily accessible by both the educated and uneducated, the rate of usage of the educated is higher as compared to the uneducated. This is because, for those who are educated, they can access the service on their own devices without necessarily having to get anyone involved to help them do transactions.

On the other hand, it is believed that, once someone is uneducated and is using mobile money, it is likely she has to consult a vendor for assistance, since it is possible, she cannot do the transaction solely by herself without any form of assistance even if she owns a mobile phone through which the transaction would be made through. Previous studies in confirmation, have identified education as a factor in the use of mobile money as it renders information on the access utilization of the service (Okello, et al., 2010). The results of the chi square 202.161 (P-value = 0.000) confirms that, there is a significant relationship between the use of Momo and women education.

The relationship between DFS usage and autonomy of women in Ghana is presented in Figure 3. Autonomy is the ability of the woman to mainly make decision by herself as to how to spend her earnings. It has been proxied for decision making power of the woman. The use of ATM is seen to

be high among women who have autonomy as compared to the women who do not have autonomy at 64.48 and 35.52 percent respectively.

Figure 3: DFS and Autonomy
Source: Appeynarh (2021)

This is due to the fact that, women with autonomy are able to take charge of their finances by opting for an ATM card based on their choice of transactions. They also mainly decide on their earnings and do not ask for permission or consult their spouses or anyone concerning how they spend the money they earn. They are therefore able to use ATM card to make transaction or any payment they decide to make be it physical or an online payment.

It is more evident among the educated women to have this kind of autonomy because, they work themselves and therefore make these decisions on their own, hence the increase in the use of ATM more than those without autonomy. The chi square results of 1.60E+3 (P-value =0.000) confirms a significant positive relationship between ATM use and autonomy. A study by Van et al., (2018) found that a woman's autonomy by the fact that she is the

key decision-maker boosts her chances of engaging in the labour market and therefore supports her use of DFS. This therefore concurs to the findings of this study that women with autonomy tend to use ATM more than those without autonomy.

Similarly, there is a positive relationship between autonomy of women and the use of E-zwich. The results indicate that 40.79 percent of women who use E-zwich do not have autonomy whereas 59.21 percent of women who use E-zwich have autonomy. This shows that women who have autonomy stand a higher chance of using E-zwich than those who do not autonomy. This observation can be credited to the fact that majority of E-zwich users are either national service persons, students or those in the public sector. Consequently, a justification by the chi square results of 144.888 (P-value = 0.000) indicating that, the use of E-zwich has a positive relationship with the autonomy of women.

With regards to E-banking, it is less (30.43%) patronized among women who do not have autonomy whereas a higher percentage (69.57%) of women who use E-banking have autonomy. Zins and Weill (2016) found out a woman's ability to solely own a bank account and further opt for an E-banking service, confirms her autonomy or decision-making power in terms of her spending and transactional activities. Based on the chi square results of 196.934 (P-value = 0.000), the study concludes that there is a significant relationship between the use of E-banking and the autonomy of women.

The percentage of women who do not have autonomy patronize mobile money much higher (81.9%) than the percentage of women who have autonomy (18.1%). It tells that, when a woman does not have autonomy, she

uses mobile money more than when she has autonomy. In comparison to the types of DFS like ATM, E-zwich, and E-banking, since the mobile money is the commonly used one, when the woman has autonomy, she is likely to use any of these more than the mobile money. In contradiction to previous studies, it was found that women's use of financial services has been enhanced by the rapid growth of mobile money, thus the ability to independently access the service without their spouse's permission to initiate financial transactions easily is with a greater autonomy (Buvinić & Furst- Nichols, 2016).

Alternatively, the use of mobile money is more convenient for women without autonomy because, decisions on expenditure and spending of income are done jointly with spouses or with other members at the household level. This makes it more convenient to use the mobile money since they get to make transactions without necessarily having to move to the vendors or the designated places of transaction. Given the chi square results of 30.462 (P-value = 0.000), the study concludes that there is a significant relationship between the use of mobile money and the autonomy of women.

The use of ATM from Figure 4 shows that, a higher percentage (80.34%) of women in the urban areas use the service more as compared to the 19.66 percent of those that are in the rural areas. Residence is a demographic factor controlling for the use of DFS by women. It refers to the precise location of women in terms of urban and rural. The location of women affects the type of DFS they use more or less. It is probable that the growth in ATM usage is due to the fact that there are a greater number of banks and ATM machines available in urban regions than there are in rural areas. Most banks have their main branches or head offices located in urban areas and this gives

rise to the increase in services available to them as compared to those at rural areas who have limited or no access to ATM machines or banks in general. The results of the chi square imply that, there is a significant relationship between the use of ATM and residence (rural/urban) of women at 564.174 (P-value = 0.000) significance level.

Women who live in urban areas use E-zwich more than those who live in rural areas. Inferring from Figure 4, the percentage of E-zwich users who live in urban areas is 78.95 percent while the percentage of those who reside in rural areas is just about 21.05 percent. This is because, users of E-zwich cards are mostly students and workers in the public sector. It is very obvious that, a considerable number of schools and public sector services are found in the urban areas as compared to rural areas. As a result, E-zwich services are more patronized in urban areas. The chi square 58.088 (P-value = 0.000) establishes that, there is a relationship between the use of E-zwich and the residence of women.

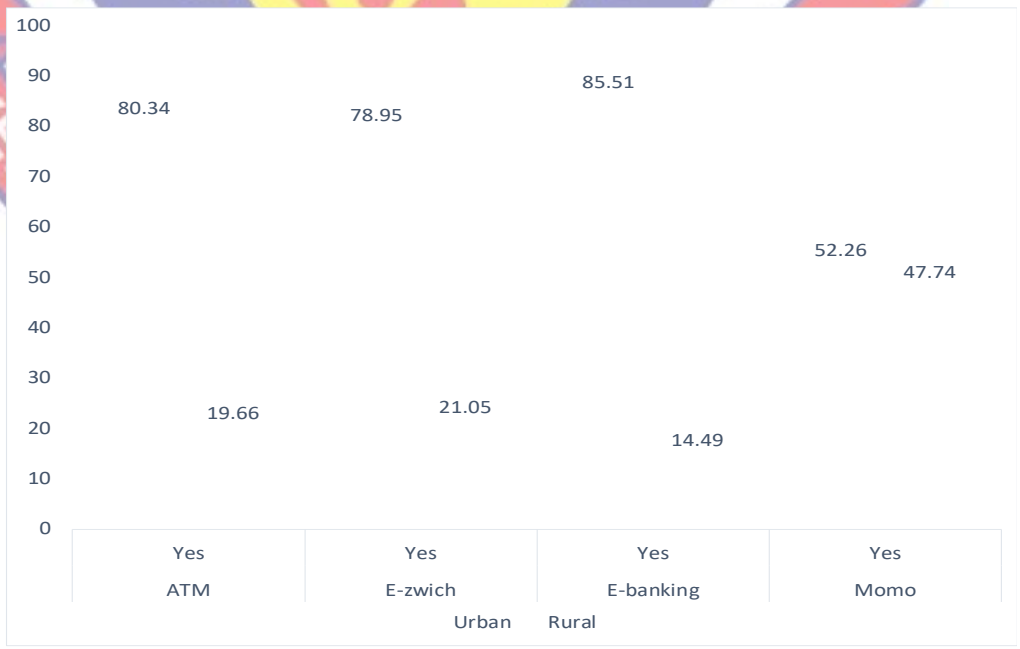

Figure 4: DFS and Residence
Source: Appeynarh (2021)

Furthermore, E-banking is also used more in the urban zones than in the rural parts among women in Ghana. This to an extent highlights the fact that there is an uneven distribution of resources across the country (Asante & Zwi, 2009). It is important to note that, financial institutions in urban areas employ E-banking services more than those in rural areas. This limits the usage of E-banking services in rural areas. The results indicates that 85.51 percent of women in the urban areas use E-banking and just about 14.49 percent of women in the rural area use the service. Form the chi square results, we can make a conclusion that there is a significant relationship between the use of E-banking and the location of women at 70.434 (P-value = 0.000) significance.

Mobile money, which is the most common type of DFS had a usage percentage of 52.26 among women in urban areas and 47.74 percent for women in rural areas. The distribution typically reflects the actual situation in Ghana in terms of the use of mobile money. Though the percentage use of mobile money is slightly higher in the urban areas, its usage in the rural areas is relatively high when compared to the other types of DFS discussed. This is because mobile money is accessible in almost every location and has an easier mode of operation. The chi square results 132.3556 (P-value = 0.000) indicates that there is a significant relationship between the use of mobile money and the location of women.

The distribution of the use of DFS in relation to ICT skills is shown in Figure 5. ICT skills basically is the ability to navigate through electronic devices and having the skill to use it in producing an outcome. Using DFS (ATM, E-zwich, E-banking and mobile money) is said to have a link with

having ICT skills. For women in Ghana who use ATM, 39.9 percent of them do not have ICT skills, whereas 60.67 percent of them have ICT skills. This is to say that, using ATM requires rigorous commands and processes in terms of its usage of the card as well as the operation of the machine.

Figure 5: DFS and ICT Skills
Source: Appeynarh (2021)

This indicates that to be able to effectively and efficiently use the ATM for financial transaction, one should have ICT skills. Owning to this, the findings revealed that use of ATM is positively related to having ICT skills. Particularly, the chi square results 2.40E+03(P-value= 0.000) showed a significant relationship between the use of ATM and ICT skills, significant at 1%.

E-zwich is operated by using an E-zwich card and a device. This device is usually used by vendors and clients for virtually all kinds of transactions. Its operation requires the use of thumbprint as a way of verification. The use of thumbprint does not require extensive use of ICT, since the vendors literally operate all the transaction procedures on the device. As such, results from the figure prove that women who do not have ICT skills

use E-zwich more (53.95%) than those who have ICT skills (46.05%). The chi square results 133.615 (P-value = 0.000) indicates the use of E-zwich has a positive relationship with ICT skills.

E-banking which is an electronic form of banking requires the use of ICT skills for its effective and efficient operation. It involves the use of exclusive subscriptions through the mobile phone or computer. These devices are ICT devices and would require one to have the skill to be able to use them. For electronic banking, one can perform banking product and services on these devices in the comfort of their homes or anywhere accessible. The results indicate that women in Ghana (66.67%) who have ICT skills use E-banking than those (33.33%) who do not have any ICT skills. This means that, the use of E-banking requires ICT skills due to its way of use. The chi square results 292.174 (P-value= 0.000) show that there is a significant relationship between the use of E-banking and ICT skills.

From Figure 5, it can be observed that, the use of mobile money among women with no ICT skills is higher (84.63%) as compared to those with ICT skills (15.37%). This is to say that, mobile money is easily accessible by anyone with or without ICT skills. However, those without ICT skills are found to use it more and this is based on its mode of delivery. It is rendered through a mobile phone smart or unsmart. It can also be done by self or through a vendor. This makes it easily accessible and the most used type of DFS among all the others. This implies that, mobile money requires less ICT skills in completing a transaction. This finding contradicts those of Adaba, Ayoung and Abbott (2019) who suggests that mobile money as a medium through which DFS could be delivered, is done with the conceptualization of

ICT skills. However, studies by Kim (2022) also contradicts their findings and concurs with the findings of this study by saying that, mobile money has enabled women benefit from financial services through payment and has increased women's access to financial channels with or without ICT skills. The chi square results 72.104 (P-value = 0.000) shows that, there a significant relationship between the use of mobile money and ICT skills.

The distribution of the use of DFS (ATM, E-zwich, E-banking and mobile money) across the ten regions in Ghana is presented in Figure 6. According to the GLSS database for round 7, collected in 2017, there were ten regions in Ghana. The use of DFS which proliferated in Ghana is believed to have spread through all these ten regions.

For ATM, it can be seen that, a 0.22 proportion of women in the Greater Accra region use it as compared to those in the Western, with a proportion of 0.02 Upper West with a proportion of 0.02, Upper East with a proportion of 0.02 and Northern regions with a proportion of 0.02. It is also used in the Central and Ashanti regions by a proportion of 0.07 and 0.08 respectively. This distribution could be as a result of more resources and more banks having their head offices being located there. Accra being Ghana's capital region is densely populated with resources and other utilities which may influence the use of ATM more as compared to the other regions mentioned.

The use of Ezwich from the distribution does not look promising in most of the regions. Aside the Central and Greater Accra regions, the rest of the regions do not seem to do well with the use of Ezwich. The proportion of women who use E-zwich are about 0.02 each.

It is seen that, even with the proportion of women who use it, it is significantly low as compared to the use of ATM. This could be associated with the fact that, the introduction of Ezwich did not have a wider reach across the country. The Greater Accra region is the capital region and is therefore more likely to have some women using the service but a very low rate.

For the use of E-banking, it is more prominent among the women in the Greater Accra and Central regions. The proportion of women who use E-banking are 0.03 for women in Accra and 0.02 for the women in the central region. The distribution shows that, the use of E-banking by in Ghana is more effective in the Greater Accra and Central region.

People in the Northern and Upper East regions are the least likely to use mobile money. This is consistent with the reality that financial institutions tend to be concentrated in urban and wealthy locations. Accordingly, a new era of digital financial services (DFS) is dawning in Ghana, thanks to the proliferation of the internet, ubiquitous mobile technology, improved processing capabilities, data portability, and other technological innovations.

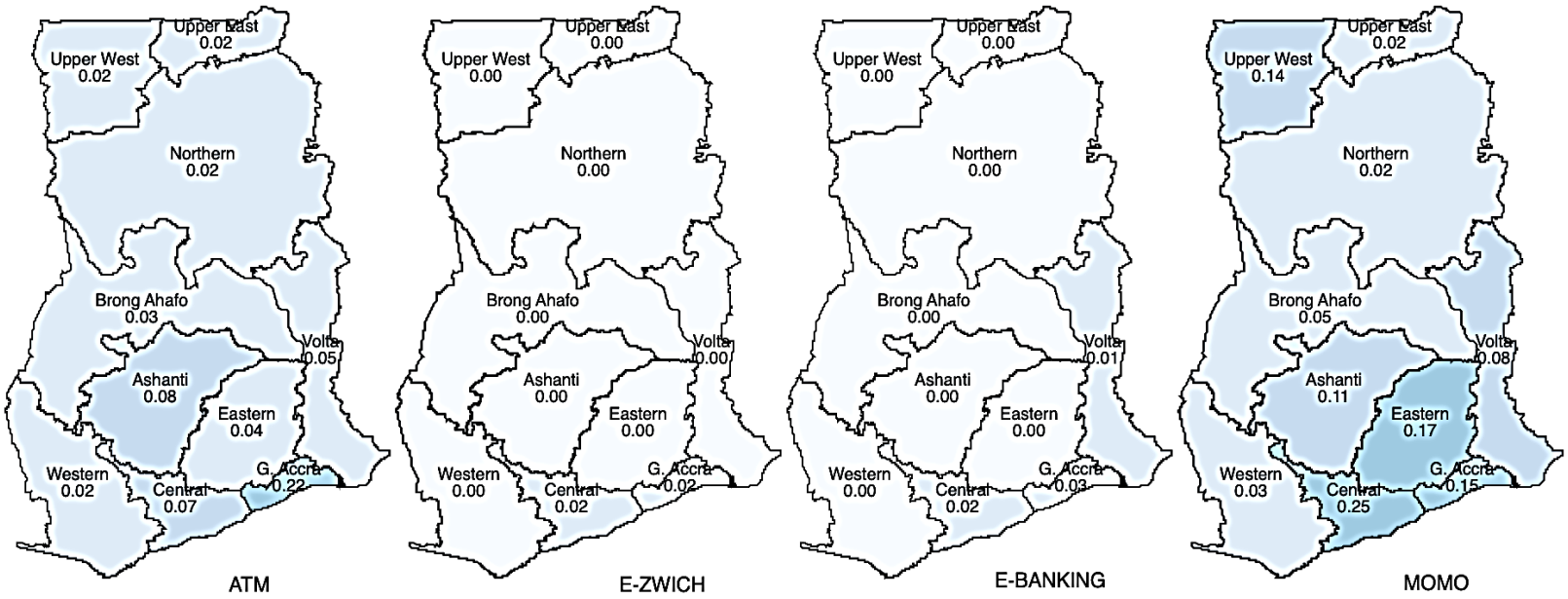

Figure 6: Distribution of DFS Usage by Region
Source: Appeynarh (2021)

Results from the Structural Equation Model

DFS and its impact on WEE were both investigated using a structural equation model and the maximum likelihood estimation method. Maximum likelihood was the method employed for the estimation. In order to ensure that the model's components (latent and observable variables) were fit for purpose, both the measurement model and the structural model had to be tested. Using the measurement model, it is clear that the model's constructs are being measured in the correct way. DFS' impact on WEE could be explained by looking at the standard coefficients in the structural model.

The fitness of the measurement model

Numerous efforts were taken to ensure that the construct's indicators appropriately reflect the model. The goodness of fit test was run to test whether the model fits the sample data. This study adopts the test for the RMSEA, CFI, TLI, SRMR and the CD as the main criteria for the fitness of the model (Kline, 2015).

From, Table 4, the test for the RMSEA was 0.074, CFI was 0.949, TLI was 0.910, and SRMR was 0.040. Comparing these to the level of acceptance for an absolute fit model, all these criteria has been satisfied, showing extensively that, the measurement model is an absolute fit model. Additionally, all the endogenous variables put together to form the construct of the measurement model is fit at a 66.4 percent variation of DFS from WEE ($R^2 = 0.664$).

Table 4: Goodness of Fit of Measurement Model for the Study

The criterion of model fit	Level of acceptance	Value
RMSEA (Root mean square error of approximation)	Less than 0.08 (absolute fit)	0.074
CFI (Comparative fit index)	Above 0.9 (absolute fit)	0.949
TLI (Tucker-Lewis's index)	Above 0.9 (absolute fit)	0.910
SRMR (Standardized root mean squared residual)	Less than 0.08 (absolute fit)	0.040
CD (Coefficient of determination)	Close to 1 (absolute fit)	0.664

Source: Appeynarh (2021)

The measurement model

The framework model in Figure 7, represents the measurement model of the structural equation model. Before the structural relationship is analysed, it is of essence to first determine if the constructs in the model have measured appropriately (Ayeh, Au & Law, 2016; Byrne, 2016). The SEM analysis was run using the Stata version 14 using the data managed from the GLSS round 7. For the estimation of the model's variables, the maximum likelihood estimation method was utilized. The fitness of this model was then checked to ensure the model fits the sample data. The measurement model includes observed variables that were used to explain these latent variables. The latent variables in the SEM model for this study were DFS and WEE.

The factor loadings of this construct show the variance explained by the variable on that particular factor. It is the correlation coefficient of the variable and factor. To examine the effect of DFS on WEE, the observed variables were used in explaining the latent variables to formulate the measurement model. The indicators for the latent variable DFS include; ATM, Ezwich, E-banking and

mobile money. The indicators for the latent variable WEE also include; Autonomy, Income level and Hours of work. The issues of validity and reliability which is to check whether the main variables in the construct were well measured have been met. This means that, the model can be consistent over time.

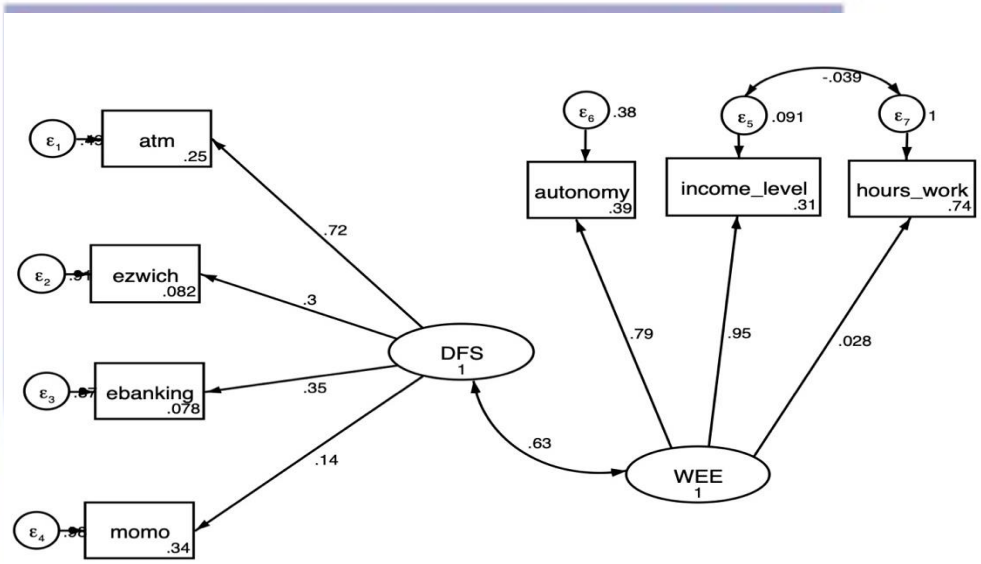

Figure 7: Measurement Model
Source: Appeynarh (2021)

From the measurement model, the path from DFS to WEE shows the discriminant validity ensuring that these variables have been measured in a distinct form. There is also a high correlation between the indicators of the WEE variable, hours work and income level. This correlation means that, the variables are dependent on each other and hence, the number of hours women work would determine the amount of income they earn. The error terms of these observed variables have therefore been correlated in the construct.

The standardized factor loadings of the measurement indicators represent the coefficients of the observed variables and the extent to which they accurately

measure the main variables in the construct. These factor loadings of the various variables are adequate, falling between 0.08 and 0.74. As a result, it is within the permissible range (Hair, Sarstedt, Hopkins & Kuppelwieser, 2014). Furthermore, the correlation coefficients between the variables are not greater than 0.80, indicating that there is no concern with multicollinearity among the variables (Hair et al., 2014; Abdullahi & Mansor, 2018; Mensah, 2019).

A woman's autonomy has a positive influence on her economic empowerment by a 0.79 standard deviation increase. A study on women economic empowerment argues that women are economically empowered by their participation in economic matters and their ability to make decisions at different levels as well as their choice of use of resources (Chloé van Biljon, et al.,2018). This therefore conforms to the measure of WEE by autonomy in a positive direction.

The measure of WEE by income level indicates, the income level of a woman has an effect on her economic empowerment by a 0.95 standard deviation increase. This means that, the income level of a woman positively influences her economic empowerment. In that, when a woman has a lower income, she is less empowered economically as compared to the one who has a higher income. This confirms the study by Golla, et al., (2011). They describe that when a woman has the capacity to progress financially, she is able to have the power to act on her economic decisions and hence improve her economic empowerment.

WEE as a latent variable is measured by the observed variable hours of work indicating that, the more hours a woman spends on her work, the higher her

economic empowerment by a 0.028 standard deviation increase. This explains that the more hours of work done by a woman, the more empowered she is economically since this will reduce her time for free domestic unpaid care work (Taylor & Preznieto, 2014; Appiah, 2011). Therefore, when a woman is a full-time worker, she becomes empowered economically as compared to when she works on a part-time basis.

The use of ATM influences a woman's use of DFS by a 0.72 standard deviation increase. This means that, the use of ATM by a woman to perform a financial transaction is directly related to her use of DFS (Jack & Suri 2011; Shaikh, Hanafizadeh & Karjaluoto, 2017; Kumaga, 2010). Also, other measures of DFS (E-zwich, E-banking and mobile money), a woman's use of E-zwich, E-banking, and mobile money confirms positively her use of DFS by factor loadings of 0.3, 0.35 and 0.34 respectively.

The exogenous variables have been explained through the paths by the standardized coefficients for the effective testing of the fitness of the structural model and are significant at $P < 0.01$.

Table 5: Goodness of Fit of Structural Model for the Study

The criterion of model fit	Level of acceptance	Value
RMSEA (Root mean square error of approximation)	Less than 0.08 (absolute fit)	0.052
CFI (Comparative fit index)	Above 0.9 (absolute fit)	0.922
TLI (Tucker-Lewis's index)	Above 0.9 (absolute fit)	0.884
SRMR (Standardized root mean squared residual)	Less than 0.08 (absolute fit)	0.031
CD (Coefficient of determination)	Close to 1 (absolute fit)	0.458

Source: Appeynarh (2021)

From Table 5, the test for the RMSEA was 0.051, CFI was 0.925, TLI was 0.888, SRMR was 0.030. All of these passed the test which confirms the goodness of fit of the model. According to Table 5, between the CFI and TLI, when at least one of them passes, the model is still accepted to fit the sample data. Likewise, all the exogenous variables put together to form the construct of the structural model is fit for the sample data at a 45.8 percent variation of DFS from WEE ($R^2 = 0.458$).

Determinants of Digital Financial Services

This study's finding on the determinants of DFS is mainly backed by the TAM model by Fred Davis (1989). The TAM model is of the view that, an individual's decision to accept technology is influenced by both internal and external factors, such as perceived usefulness and ease of use. These factors influence the rate of adoption of the technology in this case, DFS, for their financial transactions. The ease of use of the technology would motivate women to use DFS. The usefulness tends to encourage the woman to willingly adopt DFS for her financial transactions. Therefore, using DFS by women is associated with the perceived ease of use and perceived usefulness of the service. According to Gu et al., (2009), The facilitating condition is defined as the external surroundings that assist users in overcoming barriers and hurdles in order to use new IT. Before committing to using a new piece of technology, women should make sure they can use it, that there is a backup plan in place in case it breaks, and that it is dependable (Legris et al., 2003).

The path analysis in Table 6 shows that women's education has to a significant (1%) positive effect in their use of DFS by a 0.0593 standard deviation increase. This means that, when a woman is educated, she is more likely to use DFS as compared to her uneducated counterpart. The use of DFS requires some level of knowledge concerning how to use the channels through which the service is being rendered. Once a woman is educated, it is believed that, she has an upper hand in using DFS than a woman who is not educated. Alternatively, women with a greater degree of education are more likely to have the information and financial resources necessary to participate meaningfully in the financial services industry (International Finance Corporation (IFC), 2021).

The study found that, ICT skills positively influences a woman's use of DFS. The use of ICT by a woman significantly ($P<0.01$) influences her use of DFS positively by a 0.3571 standard deviation increase. DFS is rendered through some channels such as mobile phone, computers, POS terminals and the like. For one to use these devices, ICT skills becomes necessary and therefore makes it a basis for the use of DFS. With ICT skills, the woman is able to easily navigate through the features of any device she might be using to transact her financial service digitally. Garz et al., 2020 found that the having ICT skills and using DFS offers opportunity to reduce current gender inequities in access to financial services through technological access to financial services.

Table 6: Standardized Coefficients of Structural Model

Structural Path	Coefficients	Standard Error
DFS ←		
Education	0.0593***	0.0116
ICT skills	0.3571***	0.0131
Age	0.0389***	0.0119
Marital status	0.1069***	0.0112
Residence	-0.1011***	0.0110
Use internet	0.3126***	0.0135
Household size	-0.0086	0.0115
Household head	0.0916***	0.0127
WEE ←		
DFS	0.4828***	0.0188
Education	0.0091	0.0101
ICT skills	0.1208***	0.0139
Age	-0.0463***	0.0103
Marital status	-0.0087	0.0010
Residence	-0.0472***	0.0098
Use internet	0.0686***	0.0136
Household size	-0.0286**	0.0099
Household head	0.0340**	0.0111

*** $p<.01$, ** $p<.05$, * $p<.1$

Source: Appeynarh (2021)

The findings of this study indicate that a standard deviation increase in the age of a woman leads to a 0.0389 standard deviation increase in the use of DFS (P<0.01). Intuitively, older women are faced with certain responsibilities associated with the use of DFS as compared to the younger ones. These may include, sending money to children at school, as well as making some household purchases. In previous studies, it was argued that, women especially the young ones with low educational attainment and lower income use mobile money as a savings means as compared to the elderly (Kim, 2022). This contradicts the current study of the age of women having a positive influence of the use of DFS.

The study found that the marital status of a woman had a significant (1%) positive effect on DFS by a 0.1069 standard deviation increase. This means that women who are married have a higher chance of using DFS for their transactions. Married women have the ability to increase wealth and productivity as opposed to those who are not married. This is due to heightened support and joint input they receive from their spouses. Previous studies by Heath and Tan, (2020) found that at the spousal level of a household, women spouses usually report for their participation in household purchases with the use of DFS. This concurs to the finding of this study.

It was found that, the residence (rural/urban) of a woman has a negative effect on DFS. This is significant at 0.01 alpha level by a -0.1011 standard deviation decrease. Implying that, women in rural areas are less likely to use DFS than their urban counterparts. This is because rural communities have fewer resources available to them than urban areas, and as a result, they are unable to make full use of DFS. Therefore, DFS is less used in the rural area as opposed to the urban areas.

From the findings, a standard deviation increase in the use of internet lead to a 0.3126 standard deviation increase in the use of DFS. A woman who uses the internet is more likely to use DFS, and this is statistically significant at the 0.01 alpha level. E-banking or E-zwich are types of DFS are performed online and are grounded by the use of internet. Internet therefore becomes important in the use of E-banking or E-zwich for a successful transaction. Contrary to the works of Breckenridge (2010), the increased internet use has enabled people to associate E-

banking to only internet banking which could either be done offline or online. However, the presence of internet also enables a woman to do online purchases from amazon, Jumia, AliExpress and other online shops who have their payment system incorporated on their websites.

The study found that, being a household head as a woman has a positive 0.0916 standard deviation increase in the use of DFS and it is significant at 1 percent. This reveals that, women who are household heads, use DFS more than those who are not. Since, women are not laudable when it comes to the use of financial services, and the few who are finally included is by the use of DFS, household heads who are women are much more likely to be financially included by using DFS than their other counterparts who are not household heads.

Effect of Digital Financial Services on Women Economic Empowerment

The effect of DFS on WEE is presented in Table 6. It shows a standardized coefficients of the paths in the model to confirm the significance of the indicators. The main causal path between DFS and WEE was statistically significant at 1% by a 0.4828 standard deviation increase. This is an indication that there is a positive effect of DFS on WEE. The use of DFS by women increases their economic empowerment. DFS has made financial transactions easier and convenient for women who are especially engaged in some form of economic activity.

DFSs are critical to attaining this aim because they increase women's financial autonomy, encourage women's labour-force participation, and improve the performance of their businesses according to Perlman (2018). Women who

have an increased autonomy by using DFS for their own transactions, are much more likely to spend more time in their work hours, leading to an improvement in their earnings, which translates into increased economic empowerment. Dupas and Robinson (2013) argued that women who engage in financial services (such as savings, insurance, credit and investments) rendered through DFSs are able to manage risk in a better way, finance a business and fund large expenses such as education or shelter.

The study's finding of DFS having an effect on WEE is mainly backed the feminist political economy theory. This idea claims that, when women salaries are lower than those of men, their lives are directly impacted, and that women tend to stay home because their job cannot be exchanged for money in the market. For this idea, the gender pay gap is a contributing factor in lowering women's wages. In relation to this study, the effect of DFS on WEE, is on the basis of recognition-redistribution dimensions associated with women's usage of digital financial services. This is in terms of women education, ICT skills, age, marital status, residence, use of internet, household size and household head. Therefore, these dimensions by which women use DFS has an effect on their economic empowerment. As Loutfi (2001) notes, most women who do work do so on a part-time, seasonal, or occasional basis in order to meet the demands of the labour market. Part-time, seasonal, or even part-time jobs during the year are all possibilities. The significant positive effect of DFS on WEE relies on the view that women who participate in the labour market and use DFS get to have more autonomy on what they use their payments for. The use of DFS also increases

their work hours by saving more time to spend on their works and hence an increase in their income. Therefore, the economic empowerment of women is directly affected by their labour market participation and other factors such as education.

It was found that, ICT skills leads to a 0.1208 standard deviation increase in WEE and is significant at 1%. This is to say that women who have ICT skills are more empowered economically than those who do not have. For women with ICT skills, they can be able to easily navigate through ICT devices such as mobile phone, computers, laptops, televisions, and the like. They have an advantage of using these skills in operating these devices to add some value to themselves in terms of participating in existing market or getting information concerning business and other economic activities. This gives them an upper hand in being more economically empowered than those without ICT skills. This concurs to the findings of Kpodar and Andrianaivo (2011), who view ICT as a vital component that has the potential to increase the ability of women to use financial services and, consequently, aid in empowering them economically.

The findings of this study elaborates that the age of women has a significant negative (-0.463) effect on WEE at 0.01 alpha level. Intuitively, as a woman ages, she has a lower chance of effectively spending more hours on her work. This means that how old a woman becomes subsequently reduces her economic empowerment. Wachira and Kihiu (2012) found that developing countries are encouraging younger women engage in economic activities in order to empower themselves by integrating into the mainstream development process,

restoring their economic status, and providing employment opportunities through self-employment and entrepreneurship development.

Again, findings of the study indicate that the residence (urban/rural) of a woman has in inverse influence on WEE by a -0.0472 standard deviation decrease, significant at a 0.01 alpha level. Implying that, women in rural areas, have a less chance of being economically empowered as compared to those in the urban areas. In the rural areas, the opportunities available for economic activities are low and of lower value as compared to those in the urban areas. It is possible that women in the rural areas earn less or have lower incomes as compared to those in the urban areas.

Additionally, the study found that the use of internet is positively influenced by WEE and is significant ($P<0.01$) by a 0.0686 standard deviation increase. It can be deduced that the use of internet enhances a woman's economic empowerment. This is true because, if a woman uses internet, it is possible, she can make online purchases without necessarily going to the market. She can also get first-hand information concerning other feasible economic activities that will secure her a job and earn more money. In confirmation to previous study, the use of internet for financial services empowers women economically because it enhances their financial stability (Wali, Akbar, Iqbal & Al-Bahri, 2019).

Furthermore, the findings show that a one standard deviation increase in household size leads to a one standard deviation decrease on WEE, ($P < 0.05$). This is to say that, the number of people that make up the household would have a deteriorating factor on the empowerment of a woman. when the number of

persons increase, the woman stand a lesser chance of mainly making decisions concerning payments since there may be other members who are equally taking decisions and not solely the woman and vice versa. It reveals that, women in household with few members stand a higher chance of being empowered as opposed to those in larger household sizes. A paper by Duflo (2011) indicated that, economic empowerment of a woman is reduced due to the constraints of the household such as its size. In her findings, the large household sizes reduce the frequency at which the woman is placed in position to make the main decisions on payments and therefore the decisions are made by other members which makes the woman vulnerable. This is in concurrence with the current study.

Finally, this study found that, the household head has a significant (5%) positive (0.0340) effect on WEE. Inferring from this, a woman who is a head of a household is much more likely be economically empowered. Women who are heads of their homes are known to be the responsible for mainly making decisions concerning large purchases and payment for the entire household. The ability of a woman to execute these qualities enables her to be empowered economically in terms of the autonomy of the woman.

Chapter Summary

A distribution analysis was adopted to determine the correlation between DFS and socio-economic correlates among women in Ghana. This was described in terms the use of DFS in relation to the socio-economic correlates among women. It was found that there was a significant relationship between women using DFS (ATM, E-zwich, E-banking and mobile money) and socio-economic

correlates (education autonomy, residence (urban/rural), and ICT skills). The SEM was used to investigate the determinants of DFS among women as well as to examine the effect of DFS on WEE. The maximum likelihood estimation procedure was used to predict the effect in the SEM. The findings showed that, education, ICT skills, age, marital status, residence, internet use, and household head were determinants of DFS. It was also revealed that, there was a significant positive influence of DFS on WEE. The finding of the study was backed by the TAM model and feminist political economy theory.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

In order to explicitly have a view of the research on DFS and WEE in Ghana, the final chapter summarizes the entire study. To begin with, the statement of problem through to the discussions were encapsulated in the summary. Conclusions were drawn with respect to the key findings of the study. Also, some policy recommendations were made out of the findings so as to enhance the relevance of the entire study to the Ghanaian society and the world at large in addition to suggestions for future studies.

Summary

Women have been identified to be disadvantaged when it comes to owning financial accounts based on the lower percentages of account ownership compared to men. Digital Financial Services as an innovation in the financial sector in seeking to address the barriers of the traditional form of banking and improving the services of the bank's services as well as driving the financial inclusion of women, have been broadly appreciated by various research works. Nonetheless, the use of DFS is important to improving the financial sector and also driving the financial inclusion of women does not warrant its relationship with some socio-economic correlate (education, autonomy, ICT skills, residence and region) among women in Ghana. Yet, previous studies in Ghana fail to scrutinize the effect of DFS on WEE. The purpose of the study was the assess the effect of DFS on WEE. Specifically, the study sought to:

- Determine the relationship between DFS and socio-economic correlates among women in Ghana.
- Investigate the determinants of DFS among women in Ghana.
- Examine the effect of the use of DFS on WEE.

Two theories were researched in conjunction with pertinent literature on this subject area in order to lay the basis for the study. The theories reviewed were; the feminist political economy and the technology acceptance model. The empirical works were inferred in the context of their focus concerning the subject matter, methods and findings. Most of these works used survey data collected from questionnaires and the research was mainly conducted in Eastern and Southern Africa with a few from European countries. This study follows a positivist philosophy and adopted inferential and analytical research method.

The Ghana Living Standard Survey (GLSS) round 7, a secondary source was used as a source of data. Based on the data, the relationship between DFS and socio-economic correlates among women in Ghana was determined by cross tabulating DFS on the socio-economic correlates (education, autonomy, ICT skills, residence and region). The chi square statistic test was computed to justify the significance of this relationship. Again, the structural equation model was used to investigate the determinants of DFS as well as to examine the effect of DFS on WEE. The estimation was done with the maximum likelihood estimation technique. This was preceded by the test for the goodness of fit of the model for both the measurement and structural models.

This study found that, the use of the DFS (ATM, E-zwich, E-banking and mobile money) by women have a positive relationship with their education, autonomy, ICT skills, and residence (urban/rural). Also, it was established that, the proportion of women in the Greater Accra region, Central region and Ashanti region use DFS is more than the proportion of those in the remaining region.

Furthermore, the study found education, ICT skills, age, marital status, residence (rural/urban), internet use, and household head and household size are determinants of DFS among women. Thus, education, ICT skills, age, marital status, internet use, and household head are factors that positively affect the use of DFS among women whiles residence (rural) and household size negatively affect the use of DFS among women.

The study also found that, there was a significant effect of DFS on WEE. The use of DFS by women is significantly influenced their autonomy, work hours and income level, thus an increase in WEE. It was revealed that ICT skills and use of internet had a positive effect on WEE, whereas age, marital status and household size had a negative effect on WEE.

Conclusions

Based on the findings of this study, the study brings to light, the use of DFS (ATM, E-zwich, e-banking and mobile money) by women is associated with their education, autonomy, ICT skills and residence (urban/rural).

It has been concluded that, the determinants of DFS among women include their education, having ICT skills, age, marital status, residence (rural/urban), internet use, and being a household head.

This study concludes by accepting that, there is a significant positive influence of DFS on WEE. Thus, DFS has the tendency of enhancing WEE. This is because the use of DFS makes it easier and convenient for women to become more financial autonomous and also to use DFS by spending more time on her work hours and consequently earning more to increase her income level. Hence, the conclusion that, the use of DFS positively enhances WEE.

Recommendations

The study extended the following recommendations due to the findings and conclusions of the study;

Awareness campaigns (in the form of public education seminars, ICT skills training, community centre announcement, and self-help group formation) should be embarked on by MNOs, Telco's and other financial institutions to advance the knowledge of women on the benefits and relevance of DFS to them. This mostly necessitates the method of public education initiated by service providers to all women especially those in the rural areas.

The service providers of DFSs should make DFS more comprehensible and user friendly especially among women across Ghana by making the services appealing to better complement the needs of women and thereby, increasing their use of financial services. The mobile money operators and financial institutions can do this by increasing the incentives on these financial services especially with mobile money which is the commonly used service among the DFS types in Ghana. Also, these service providers should target the rural areas by extending

variety of DFS products to cater for their transactions in order to eliminate the barriers posed by the traditional banking system.

Organizations like the Alliance for African Women Initiative, Gender Centre for Empowering Development, SocietyAid Ghana among others should encourage women with some leverage on digital financial services in order to increase their financial inclusion and other associated positive development externalities that would empower them.

Given that there is an effect of DFS on WEE, it is recommended that women embrace the use of digital financial services in their economic activities to help promote their financial autonomy. Women who use DFS be more cautious and intentional in how they use the services so as to increase their autonomy, hours of work and income levels, thus, enhancing their economic empowerment.

Suggestion for Future Studies

Considering the findings, conclusions, recommendations and limitations of the study, this study could be a basis for future research to use different data set on specific additional DFS types and other indicators of WEE to observe the direct and indirect impact of DFS on WEE.

This study did not emphasize on the risks associated with the use of DFS and how those impacts on WEE. Future studies should consider risks and confidence in the use of DFS among women.

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APPENDIX

Appendix A: Pairwise Correlation Matrix

VAR	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Hhsize	1															
Hhhead	-0.06*	1														
Age	-0.12*	-0.00	1													
Inc_Sour	-0.13*	0.02*	-0.09*	1												
Autonomy	-0.13*	0.02	-0.11*	0.75*	1											
Hrs_Wrk	-0.04*	0.03	0.00	0.02	0.02	1										
Atm	-0.12*	0.02	-0.05*	0.45*	0.38*	0.01	1									
Ezwich	-0.02	0.02	-0.02	0.15*	0.11*	-0.01	0.18*	1								
E_Bank	-0.03	0.02	-0.01	0.17*	0.13*	-0.02	0.23*	0.30*	1							
Momo	-0.08*	0.04*	-0.04*	0.06*	0.05*	0.02	0.08*	0.11*	0.10*	1						
Use_Int.	-0.14*	0.03	-0.12*	0.41*	0.38*	0.05*	0.45*	0.12*	0.14*	0.11*	1					
Ict_Skill	-0.12*	0.02	-0.18*	0.43*	0.39*	-0.01	0.46*	0.11*	0.16*	0.08*	0.64*	1				
Edu	-0.21*	0.03	-0.34*	0.17*	0.17*	0.06*	0.17*	0.05*	0.05*	0.13*	0.26*	0.22*	1			
Mar_St	0.14*	-0.02	0.05*	-0.04*	-0.09*	0.02	-0.01	-0.02	0.00	-0.03	-0.12*	-0.20*	-0.15*	1		
Resid	0.23*	-0.07*	0.01	-0.22*	-0.23*	-0.16*	-0.22*	-0.07*	-0.08*	-0.10*	-0.29*	-0.22*	-0.26*	0.08*	1	
Region	0.21*	-0.03	-0.01	-0.10*	-0.10*	-0.00	-0.10*	-0.05*	-0.05*	-0.10*	-0.15*	-0.12*	-0.33*	0.07*	0.24	1

Note: *p< 0.01 indicates significance at 1%.

Source: Appeynarh (2021)