Investigating the impact of Digital Financial Inclusion on Financial Risk Management: Evidence from Egyptian Banking Sector from 2014 to 2023

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ABSTRACT

This research aims to inspect the impact of digital financial inclusion on financial risk management in light of financial stability in the Egyptian banking sector. Using data collected from the Egyptian banking sector represented by (38) banks, during the period from (2014 – 2023), to analyze the data, using multiple regression analysis and structural equation model (SEM) by means of instantaneous structure analysis (JASP 0.19.1). The results showed that there is a significant impact of digital financial inclusion on financial risk management. Also, found a significant impact of digital financial inclusion on financial stability. Finally, the results indicate the existence a significant impact of financial stability on the relationship between digital financial inclusion and financial risk management on Egyptian banking sector. Study recommended the need to increase financial education among individuals through financial literacy, maximizing the benefit from technological developments and modern methods, increasing the spread of bank branches, and increasing number of active mobile money accounts. In addition, weak link between digital financial inclusion and financial risks suggests to banks that need to expand their agent networks and digitize their services by deploying (AI) and machine learning to attract people from all economic classes, which will be reflected in increasing investments in Egyptian banks.

Keywords: Digital financial inclusion – Financial Risk management – financial stability - Egyptian banking sector.

1- INTRODUCTION:

The banking sector is one of the industries that adapts to international and local changes, which aims to contribute significantly to Egypt's 2030 sustainable development, through several global trends such as digital financial services, including digital financing and digital inclusion. Following the 2008 global financial crisis, interest in financial inclusion started to increase. As the government investigated several ways to guarantee the ability to register of financially excluded segments of society (Srinivasan, Rameshm Gunasekaran & Sivasubramanian, 2024).

Digital financial inclusion has enormous potential to offer a range of banking services through innovative technologies like digital platforms and e-money models, mobile-based solutions, and enable people with bank accounts to obtain financial services via digital technology (Asif, Khan, Tiwari & Alam, 2023)

Digital financial instruments such as e-money cards, debit cards and low-cost banking services significantly expand the scope of financial inclusion for excluded individuals (siddik & Kabiraj, 2020). Every social and economic indicator reflects the impact that financial services have on citizens' lives. Many people have remained outside the financial services network for a variety of reasons (Rana, Luthra & Rao, 2019). Therefore, financial services must include all segments of society and enable them to access a financial service, which is known as financial inclusion. Financial inclusion, according to the International Monetary Fund, is the availability and utilization of formal financial services by all individuals and enterprises (IMF, 2022). We also discover that many of the Sustainable Development Goals depend on expanding access to financial services (Tang, Ran, Ran, 2024).

The ongoing COVID-19 crisis has also reinforced the need for increased digital financial inclusion. Digital financial inclusion is the use of cost-effective digital tools to provide underserved and financially excluded groups with a variety of formal financial services that meet their needs and are responsibly provided at a price that is both affordable for consumers and sustainable for providers (World Bank, 2022).

The level of financial inclusion in (MENA) region is among the lowest globally this is because only 44.4% of adult citizens in the MENA area have a account in a formal institution, compared to 61.5% globally. According to the most recent World Bank in 2019, Egypt suffers from high levels of financial exclusion, where only about 33% of Egyptians & 14% of adults had a bank account. Additionally, Egypt is also preparing for a cash-based economy (World Bank, 2019) (Khmous & Besim, 2020).

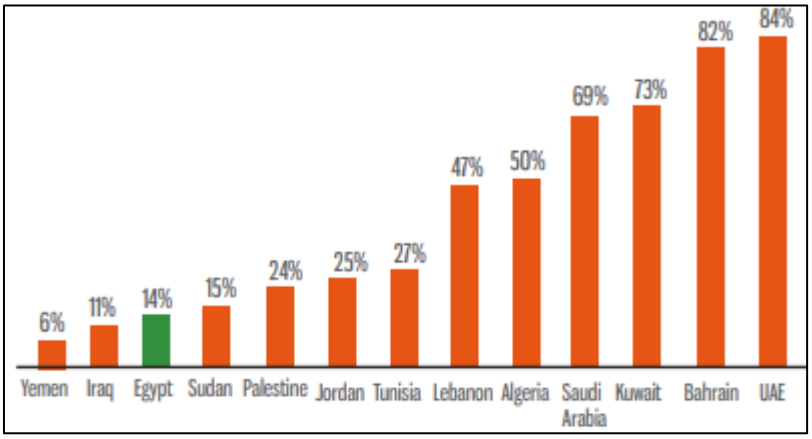


Figure (1) Adults with computation at Formal Financial Institution

https://www.worldbank.org/en/topic/financialinclusion

Egypt is not an exception, where the government has introduced the Sustainable Development Strategy (SDS): Egypt's Vision 2030, making financial inclusion the major goal of the entire SDS as well as a high national priority (Central Bank for Egypt, 2020).

However, like any developing country, achieving high levels of financial inclusion is not an easy goal. According to the World Bank`s Global Findex database, as of 2019, only 33% of Egypt's adult population has a bank account a much lower percentage compared to other developing countries. Barriers that unbanked people from accessing and using formal financial services include distance the expense of creating a bank account, the absence of necessary official papers, and not having enough money to open a bank account (Ismael & Ali, 2021).

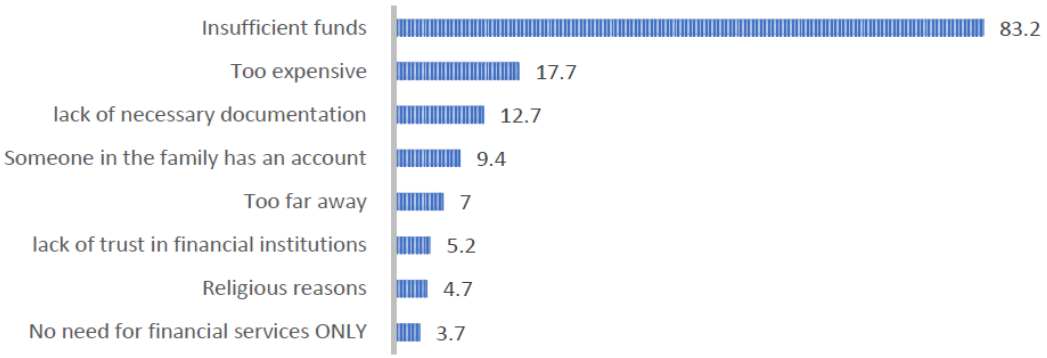


Figure (2) Barriers perceived by Egypt`s unbanked population

Source: Global Findex Database. 2020

One form of digital financial inclusion that the central bank uses to improve system competency is bank financing as a financial service. This is done in order to promote the safety of the financial industry in the country to face possible risks that may impact financial stability (Samy, Kernstock, Volland & Hein., 2024). Enhancing financial inclusion contributes to improving access to financial services for a greater number of individuals and institutions and is done on two sides. first: the provision of financial services, and second side: demand for financial services through adoption of national strategies for financial education, which will result in increased financial stability, and this will be reflected in increased investments in banks (Pranajaya, Alexandr, Chan & Hermanto, 2024).

Thus, the major aim of this research is to investigate the impact of digital financial inclusion on financial risk management in light of financial stability in Egyptian banks.

2- RESEARCH PROBLEM:

The banking sector is one important factor that has a significant impact on economic activity. It is among the sectors that react to changes the quickest, whether they are local or global. In terms of their variety, presentation strategies, distribution, and ease of access, financial products and services are undergoing rapid change. As a result, a number of cutting-edge financial products have surfaced that call for a high level of financial literacy and culture as well as the capacity to control the risks associated with their use (Central Bank for Egypt, 2020). Therefore, there is a need for financial education, particularly for low-income groups and small investors, to educate them on the advantages and risks of new financial products and services as well as how to choose, use, and manage the finance that small and medium-sized businesses and low-income families require (Yang & Masron, 2024). This is due to the fact that raising the standard of financial services and facilitating greater access to them for both individuals and organizations helps to promote equality of opportunity, improve the financial situation of the impoverished, and offer banking services to groups that are otherwise excluded (Hassouba. 2021).

The implementation of policies that improve and facilitate access to financial services for all segments of society, enable them to use them appropriately, and encourage providers of financial products and services to offer diverse and innovative services at a low cost suitable for the poor has therefore increased global interest in achieving financial inclusion, particularly in the wake of the global financial crisis (2008). Financial inclusion was chosen by the G20 as one of the primary pillars of the agenda for economic and financial development (Tay Tain& Tam. 2022).

As the backbone of the financial banking system, banks must be kept stable, sound, and trusted by their depositors, particularly during times of financial crisis. Thus, the phrase "financial stability" came into being as a result of the numerous financial crises that affected the economies of both industrialized and developing countries (Alfiana, Judijonto & Al-Amin, 2024), with differing effects in each. The level of confidence in a country's economic policies and financial system's capacity to handle financial crises, face them head-on, and lessen their impact is directly related to financial stability. In order to preserve the financial system as a whole, maintaining financial stability involves trying to reduce the risks of bankruptcy by monitoring the operations of financial institutions and making sure they don't default. Any disturbance in the financial sector renders it incapable of handling shocks (Telukdarie & Mungar, 2023).

Enhancing digital financial inclusion has a positive impact on integrating the informal sector into the formal sector, which increases financial stability and improves risk management in banks. It also helps to improve access to services for more people and institutions by attracting more remittances and expanding innovative services, which addresses the issue of lack of information.

Based on the above, the main problem is represented in the following question:

Does digital financial inclusion affect risk management in light of financial stability in Egyptian banking sector?

3- RESEARCH OBJECTIVES:

The research aims to clarify the concepts associated with digital financial inclusion on the one hand and financial risk management on the other hand, while studying the relationship between digital financial inclusion and financial risk management in light of the presence of financial stability as control variable. It also seeks to identify the reality of digital financial inclusion in Egyptian banks and study ways to enhance it.

4- REWIEW OF LITERATURE

4.1 Theoretical Background

According to financial inclusion theory, economic development and poverty alleviation depend on having access to financial services, and digital technology can significantly reduce barriers to financial inclusion like high transaction costs and a lack of physical infrastructure (Kling et al., 2022). The technology acceptance paradigm suggests that perceived beneficial and ease

of use determines users' acceptance and usage of technology. In order to increase acceptance among potential customers and achieve financial system stability, financial services providers might concentrate on creating digital financial products that are advantageous and easy to use (Kamble, Mehta & Rani, 2024).

Digital financial inclusion seems to have garnered more attention in recent years due to its substantial impact on economic growth, poverty alleviation, and personal well-being. Given the extent of the literature on the subject, we first review the concepts, dimensions, and literature of Digital Financial Inclusion in general and then examine its interaction with Financial Stability (FS) and Financial Risk Management (FR) in particular.

4.2 Digital Financial Inclusion (DFI) Definitions and dimensions

4.2.1 Definition

Digital Financial Inclusion is the ability of financially excluded people to access and utilize formal financial services digitally in an economical, sustainable, and responsible manner within the proper legal and regulatory framework (Ozili, 2018).

Digital financial inclusion involves the use of economical digital methods to give underserved and financially excluded populations with a variety of financial services that meet their requirements and are ethically provided at a price that is both sustainable for providers and inexpensive for consumers (Naumenkova, Mishchenko & Dor0feiey, 2019).

(Koh, Phoon & Ha, 2018) defined digital financial inclusion as the practice of using digital technologies, such as online financial services, digital payment platforms, and mobile banking, to give underserved and unbanked populations access to financial services. We find that both (Neaime and Gaysset, 2018; Morgan & Pontins, 2014; Khan, 2011) define digital financial inclusion as the norm that financial institutions' services are made to be widely available to low- and middle-income groups so that they can conveniently pay back loan interest (Yadav et al., 2020).

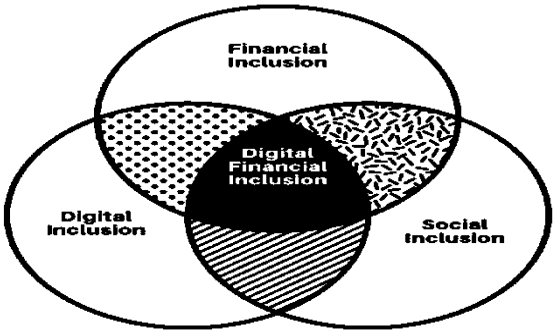
We find that Digital Financial Inclusion is a way to guarantee that people, especially those in poverty, have access to the necessary financial services in the official financial sector (Ismael & Ali, 2021; Ozili, 2018). Digital Financial Inclusion has drawn a lot of attention from scholars and politicians for (4) causes. First, a critical approach to achieving sustainable development goals is digital financial inclusion (Agrawal & Jain, 2019); secondly, the scale of gregarious inclusion in many communities is developed with the use of digital financial inclusion; thirdly, digital financial inclusion

can help reduce poverty to a necessary minimum (Ozili, 2021), and lastly, various socio-economic interests are attended by digital financial inclusion (Khera, Ogawa & Sahay, 2021). In order to reduce financial exemption, politicians in numerous countries continue to take significant steps to increase the level of digital financial inclusion in their countries (Tay et al., 2022).

The value of Digital Financial Inclusion is to promote economic transformation and supporting economic activities while emboldening all people of all income levels to join in financial stability. Its significance goes beyond that; it can also aid in bolstering crisis response measures like COVID-19, which necessitated new strains on the banking system due to the increasing need for digital transformation and the development of digital finance more than ever before. (Arunachalam & Crentsil, 2020).

4.2.2 Digital Financial Inclusion dimensions

Digital financial inclusion is the junction of financial inclusion (financial access and financial literacy), digital inclusion (accessibility, ability and affordability) and social inclusion (social capital and social networks) (Aziz & Naima, 2021).



Source: Aziz, A., & Naima, U. (2021). Rethinking digital financial inclusion: Evidence from Bangladesh. Technology in Society, 64, 101509.

Nearly 57% of Egyptians, or over 57 million people, utilized the internet in 2021, a significant rise over 2019 and 2020. Due to constraints, internet usage increased during the COVID-19 pandemic, speeding up this trend. Like other countries, Egyptian authorities' actions during COVID-19 restricted movements. Hence, many who were confined to their homes started using technology more. 93% of users access the internet primarily through mobile devices, and more than 40% of them use social media (Figure 3) (Sharma & Changkakati, 2022).

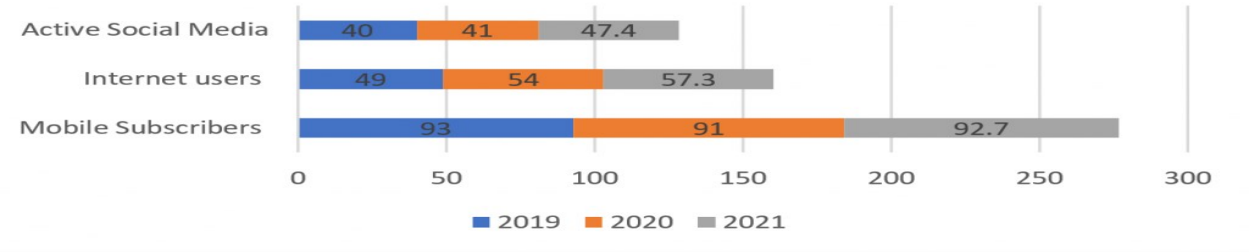


Figure (3) Digital Users and Subscribers in Egypt (Above age 16), 2019-2021

Source: https://datareportal.com/reports/digital-2021-egypt

Even though more people are using the internet, Egypt still has challenges with digital financial inclusion. Digital financial inclusion blends cutting-edge technology with conventional inclusive finance, with the benefits of affordability and ease of use. Nonetheless, it is expected that over 67% of Egyptians lack access to banking services and utilize credit cards, online e-bills, and mobile money accounts sparingly (Aziz & Naima, 2021)..

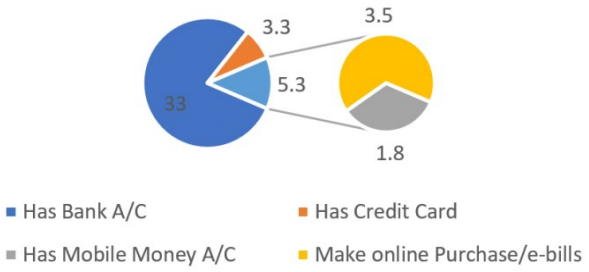


Figure (4) Population Reporting Having Product and Services %

Source: https://datareportal.com/reports/digital-2021-egypt

There are many literatures that deal with digital financial inclusion. We find that (Sha'ban. Ayadi. Forouheshfar. Chailita & Sandri, 2024) aims to investigate the factors that influence both traditional and digital financial inclusion, with an emphasis on how digital inclusion acts as a catalyst for traditional financial inclusion. Based on global data from (2004 - 2020), We create two multifaceted indicators of financial inclusion, both traditional and digital, and track trends over time. Additionally, it looks at the role of digital financial inclusion in fueled traditional financial inclusion. The findings indicate that over the examined period, financial inclusion significantly improved. High-income European countries lead traditional financial inclusion; while emerging African countries dominate digital financial inclusion. Additionally, it demonstrates how, in the medium run, digital financial inclusion paves the way to traditional financial inclusion.

Also, study (Mpofu, 2024) outlined how the financial industry's digital transformation aims to change how financial services are provided by reducing barriers and expenses to access. Additionally, it recognizes that the goal of digital financial inclusion (DFI) is to guarantee the execution of financial services, including investments, transfers, withdrawals, payments, deposits, and access to credit and insurance. DFI works to improve financial inclusion for all stakeholders by guaranteeing that people, companies, and families have access to financial services via digital channels and platforms. The study found there are numerous potential advantages to using digital financial services, such as boosting economic growth, diversifying and innovating the financial services industry, extending financial inclusion, and accomplishing sustainable development goals.

(Widyastuti, Respati, Dewi & Soma, 2024) aims to determine how demographic characteristics and digital financial literacy (DFL) affect digital financial inclusion (DFI). Data from 160 households with at least one bank account were used. Binary logistic regression was used to analyzed the data and classify the sample as either digital financial inclusion or not. The findings demonstrated that demographic characteristics and digital financial literacy affect on digital financial inclusion. Digital financial inclusion was marginally impacted by marital status and gender. On the other hand, DFI in Indonesian families is mostly explained by digital financial inclusion as well as other demographic variables including age, income, and occupation.

(Khmous & Besim, 2021) aims to examine the effects of individual characteristics and the percentage of Islamic banking on financial inclusion in 14 MENA countries with varying income levels. The test assessment method is utilized for appreciation. The findings indicate that financial inclusion is below the worldwide average, particularly in middle-income MENA. Although being older, wealthy, and male has a positively impact on financial inclusion in these countries, education does not. While **(Ghosh & Bhattacharya, 2019)** demonstrate that financial inclusion was completed despite the fact that financial innovations like "SureCash" were able to reach Bangladesh's impoverished adults and women by breaking into the oligopolistic financial industry.

Meanwhile, (Bongomin et al., 2020) study aimed to ascertain how social networks influenced the relationship between financial literacy and the financial inclusion of the poor by microfinance institutions in developing nations. (SEM) by means of instantaneous structure analysis (AMOS) was applied to test the data. The results show that financial inclusion is significantly and favorably impacted by financial literacy. Overall, the results show that the presence of a social network acts as a complete mediator between the impact of financial literacy and microfinance banks' efforts to provide financial inclusion to the poor in developing countries**.**

Several studies (Ahmad, Majeed, Khan, Sohaib & Shehzad, 2021; Iqbal & Sami, 2017; Garcia & Jose, 2016; Aguera, 2015; Cull, Ehrbeck & Holle, 2014) revealed that there are (3) dimensions of financial inclusion access, quality, usage, and barriers.

4.2 Digital Financial inclusion and financial stability

The global financial crisis (GFC) sparked a thorough reevaluation of financial stability, and the measures needed to attain it. To strengthen the Financial System, extensive and widespread international regulatory reform initiatives have been underway for more than ten years (Aikman et al., 2019)

Although the phrase "financial stability" has several definitions, most of them share a common view. A stabilized financial system that can allocate resources and withstand shocks to avoid disrupting real sector activity and the financial system is what the European Central Bank (ECB) (2012) defines as financial stability. (Pham & Doan, 2020).

Numerous studies have been carried out in different nations on a variety of topics pertaining to mobile technology, such as determining priority for socially disadvantaged sectors, microfinance, gender engagement, etc., with the intention of encouraging participation in financial networks in order to strengthen the drive for digital financial inclusion and improve financial stability. Where stability comes from, using data from 86 nations, (Mpofu, 2024; Ahamed & Mallick, 2019) similarly, stability studies have not verified access to financing in new areas, and their findings are equivocal. The impact of digital financial inclusion on banks Stability is unclear, and more research is needed to fully investigation the link. In its 2012 Global Financial Development Report, the World Bank also offered proof of the inverse relationship between stability and inclusion.

We find that (Ozili, 2024) aims to investigate how gender equality affects digital financial inclusion and financial stability. Statistical data was collected from 14 developing countries during the period (2005-2021) using the generalized linear regression method to investigate the impact of gender equality on financial inclusion and financial stability. The study found that financial stability and digital financial inclusion in emerging countries are significantly improved by gender equality. In African countries, gender equality significantly improves financial stability and digital financial inclusion.

Study (Antwi, Kong & Cyimah, 2024) aims to investigate how financial inclusion and competition affect financial stability. The study relied on data from 60 developing countries during the period (2002-2019), and the data were analyzed using the GMM method. According to the study, financial stability in developing countries is not significantly impacted by financial inclusion. Conversely, competition among these countries demonstrates a strong ability to improve financial stability. In addition, financial stability in developing countries is not significantly impacted by financial inclusion. Conversely, competition among these countries demonstrates a strong capacity to improve financial stability.

(Chinoda & Kapingura, 2023) demonstrated that attaining faster economic development and parts of the Sustainable Development Goals depend heavily on digital financial inclusion. Using the two-step system generalized moments method (GMM), the study used a new measure of digital financial inclusion to investigate how bank competition and digital financial inclusion affect bank stability in Sub-Saharan Africa from 2014 to 2020. Digital financial inclusion was found to have a negative relationship with non-performing loans and a significant positive relationship with bank stability. Additionally, it discovered that bank competition has a major detrimental effect on bank stability. Since digital financial literacy promotes bank stability and reduces bank failures, policymakers should make sure that everyone has access to it.

(Banna et al., 2022) aims to investigate the role of digital financial inclusion in the stability of the Islamic banking sector during the present COVID-19 pandemic. Using unbalanced panel data for 65 Islamic banks from six countries between 2011 - 2020, the study used the panel-corrected standard errors (PCSE) method, two-stage least squares instrument variables (2SLS-IV), and two-step dynamic panel estimation method (2SGMM) to examine the relationship between digital financial inclusion and the financial stability of Islamic banks. According to the report, increasing the adoption of digital financial inclusion improves Islamic banks' stability and reducing their default risk. Therefore, including digital financial inclusion into the Islamic banking sector promotes equitable economic growth that can keep the sustainability of the financial sector even in times of crisis.

The results of many literatures, including (Jonker & Kosse, 2022; Tay, Tai & Tan, 2022; Ozili, 2021; Anarfo & Abor, 2020), indicated that the stability of banks develops financial regulation to have a positive impact on financial inclusion.

H_1. There is no significant effect of digital financial inclusion on financial stability on the Egyptian Banking Sector.

4.3 Digital Financial inclusion and Financial Risk management (FR)

Risk is a potential event that affects the achievement of an organization's strategy and objectives. This risk can have a positive or negative impact on the organization (Banna & Alam, 2021).

Financial risks include the incapacity of the firm or organization to pay or settle its debts, which can be caused by economic instability, fluctuations in currency and exchange rates, or the possibility of financial losses in the markets (Ozil, 2021).

Financial risk management includes identifying the types of risks that the company may face, quantifying those risks, recommending plans to hedge, ensure, or reduce a number of risks, and understanding how these risks affect the company's future profits (Boskov & Drakulevski, 2017).

Researchers, practitioners, and regulators all agree that effective financial risk management is a fundamental component of bank management. The Basel Committee on Banking Observation adopted Basel I, Basel II, and, more recently, Basel III to address this issue in light of this fact and the necessity of an integrated program to transact with bank risk management (Ahmed et al., 2024).

The Financial Risk Management operation, as defined by the International Organization of Standardization (ISO), is a set of coordinated operations that includes risk identification, risk ranking, risk response, and risk observation. The Risk Management Structure should be reviewed (Bashaija & Mahina, 2018)

Many studies address the impact of applying financial instruments and financial services on financial risk. We find that study (Yang & Masron, 2024) aims to determine how digital transformation and financial inclusion affect credit risk. Data from 116 Chinese banks were used during (2014-2021) using the generalized mean-of-moments (GMM) approach. The results suggest that financial inclusion plays an interactive role in the relationship between digital transformation and credit risk. Additionally, it was discovered that digital transformation significantly reduces bank credit risk. This influence on risk reduction will increase with financial inclusion, thus banks must integrate financial inclusion to improve bank risk reduction and raise risk assessment accuracy.

Also, (Zhang, Ya, Liu & Du, 2023) aims to look into how commercial banks' digital financial inclusion and FinTech development affect bank credit risk. Using a web crawler, information from 138 Chinese commercial banks from 2013 to 2021 was utilized. The findings indicate that the emergence of FinTech considerably reduces commercial banks' credit risk levels, and that using FinTech to manage digital risks at banks is crucial to reducing bank credit risk.

(Banna & Alam, 2021) aims to investigate the relationship between banking risk levels and digital financial inclusion. Using panel-corrected standard errors, two-stage least squares instrument variables, and the generalized dynamic moment estimation method were used for a sample of 283 commercial banks (conventional and Islamic) from 6 countries during the period (2011-2019). The data imply that Islamic banks incur larger risks than conventional banks. Additionally, it demonstrated that, in comparison to Islamic banks, commercial and conventional banks are more stable and have reduces total banking risks as their scores on the digital financial inclusion index increases.

(Evans, 2018) examine the relationship between digital financial inclusion, mobile phones, and the Internet in Africa between 2000 and 2016, Additionally, people's access to basic financial services was enhanced by the Internet and mobile devices, which raised the degree of digital financial inclusion, which leads to reduced risk. Also, **(Hannig & Jansen, 2010)** recognize that the goal of financial inclusion is to draw people "who do not have access to finance" into financial systems so they can access financial services like credit, transfers, deposits, and other financial services, which reducing financial risk.

Furthermore, (Goswami, Sharma & Chouhan, 2022; Shihadeh, 2020; Shihadeh et al., 2018; Bernini & Brighi, 2017; Jack & Suri, 2014) discovered that financial risk and financial inclusion are negatively correlated.

In general, all banks are exposed to a variety of risks, including market, liquidity, credit, operational, business and growth risks, etc. We'll concentrate on (3) main types of financial risk—credit, interest rate, and exchange rate risks—and how each is impacted by the degree of adoption of digital financial inclusion. Thus, we propose:

H_2. There is no significant effect of digital financial inclusion on Banking Risk Management.

4.4 Financial stability and Financial Risk

Financial System Stability is a case of a robust and resilient financial system and resistant to economic disturbances, it can continue to carry out its financial brokerage function and support economic growth. According (Stefaniak, 2018) when markets and financial institutions operate smoothly and without significant disruptions, this is referred to as financial stability.

The economy's methods for pricing, allocating, and controlling financial risk, such as Market, credit, interest, and others, are all included in the scope of financial stability. All are functioning well that can support economy’s performance (Widarwati et al., 2019). The financial sector's tendency toward globalization is supported by technological advancement. The financial

system is highly linked, free from borders and time lag, and financial innovations are becoming more dynamic and risk diversified. These modifications are contributing factors to the financial system's increased instability, which makes it more challenging to restore stability. As a result, it must use every effort to preserve the stability of the financial system and reduce risks. (Wirawan & Willim, 2023)

(Ben-Lahouel; Taleb; Ben-Zaled & Managi, 2024) aims to determine whether and how liquidity risk impacts European banks' stability at varying degrees of engagement in non-traditional banking operations following the global financial crisis of 2008 and throughout the Basel III liquidity standards' implementation. To measure financial stability, we apply an efficiency perspective based on integrating the CAMELS classification system and the data envelopment analysis technique. We use a non-linear smooth transition regression technique in which the data's endogenous transition determinants for income diversification are captured. The study finds that banks' stability is positively impacted by liquidity risk, income diversification can act as a hedge to help banks guarantee the generation of liquidity.

(Aifiana, Judijonto & Al-Amin, 2024) aims to examine efficient credit risk management techniques for enhancing banking industry financial stability. To determine the most important credit risk management techniques, a number of literatures were examined. According to the study, putting in place a rigorous and ongoing credit control system and utilizing analytical technology to identify risks early are crucial. It was shown that diversifying the credit portfolio was a useful strategy for lowering concentration risks and averting losses. Additionally, it underlined how crucial adherence to global banking standards like Basel III is to preserving financial stability.

(Mayordomo et al., 2020) aims to determine the effects of substitution kinds of integration on bank stability and credit risk. it found that the market strength of bank mergers lowers credit risk, raises interest rates, and decreases non-performing loans as compared to Bank Business Groups. We argue that while short-term welfare gains from improved financial stability outweigh losses from reduced credit, low long-term cost efficiencies result in significant welfare increases.

Additionally, Basel III, which calls for less regulation of liquidity and more capital, was supposed to increase the overall financial system's flexibility. Regretfully, none of these actions improved the stability of the financial system; on the contrary, they increased instability. As the coronavirus epidemic strikes the world, many people are anxious to see what policies and relief packages governments will swiftly unveil in order to reduce risks and achieve financial stability.

Furthermore, (Taskinsoy, 2020) showed that the Basel Committee was compelled by the domestic Asian crisis of 1997–1998 to implement a revised framework known as Basel II and to encourage the Global Monetary Fund (DMF) and the World Bank to establish a joint Financial System Assessment Program (FSAP) with the aim of "gauging the stability and soundness of financial sector and to assess its potential contribution to development of risk management". Simultaneously, (Elbadry, 2018) aims to determine how Saudi banks' financial stability affects financial risk (FR). Various (OLS) models have been used to investigate the significant impact of banks' financial stability index on different risk species. All banks' financial statements from 2011 to 2014 were included. The findings show that (CAR) has a significant and detrimental impact on credit risk. Additionally, the leverage ratio has a significant and favorable impact on credit risk. Lastly, the findings show that the loan-to-deposits ratio has a significant and adverse impact on operational risk. Thus, we propose:

H_3. There is no significant effect of Financial Stability on Banking Risk Management.

4.5 Relation between digital financial inclusion and Financial Risk in light of Financial Stability

Since the early 2000s, Governments and central banks throughout the world have taken notice of the concept of financial inclusion because of its contribution to the objective of financial developments. In both developed and developing nations, increasing access to official financial services at the household and business levels contributes to economic positions and poverty reduction. Following the Global Financial Crisis of 2008, the issue of bank stability has surfaced and drawn the attention of scholars and decision-makers worldwide through the study of reducing financial risk and enhancing financial stability in relation to a nation's strategy for sustainable development. This begs the question of whether financial stability and inclusive finance go hand in hand, particularly whether financial inclusion promotes or discourages adventure Financial Stability. (Xu, Zhang & Zhou, 2024)

(Oanh, 2023) aims to investigate the connection between monetary policy, financial stability, and financial inclusion. Using the PVAR approach, research data were collected from 58 countries during the period (2004-2020), including 31 with high financial development and 27 with low financial growth. It was discovered that in countries with low levels of financial development, risk management is favorably correlated with financial inclusion and stability, while inflation and money supply growth are

negatively correlated with these factors. Additionally, financial stability has a negative relationship with financial inclusion, inflation, and money supply growth rates, whereas financial inclusion has a positive relationship with these factors in nations with poor financial development. These findings suggest that financial inclusion lowers inflation and improves financial stability in countries with weak financial systems. On the other hand, financial inclusion raises financial instability and risk in countries low poor financial development.

(Kuznyetsovam Boiarko, Khutorna & Zhezherun, 2022) refer to search the connection between financial stability and financial inclusion to reduce Financial Risk below the Asian economy's range. In 42 countries in three departments, correlations with data will be thoroughly examined at the state and bank levels. Usage and access are the two dimensions: used in this study to evaluate the overall financial system. The dependent variable during this period is financial stability, which is proxied by the Bank Z-Score. As a result, the random effects regression is solved using (FGLS) regression. According to the application results, financial inclusion has very little beneficial impact on financial stability.

(Dienillah et al., 2018) demonstrates that in many countries, financial inclusion is one of the best ways to increase via expansion. When financial inclusion results in a decline in credit standards and an increase in financial risks, the financial system may become unstable. Thus, the goal of this study is to compare the rates of financial inclusion and financial stability among countries and determine how financial inclusion affects financial stability, which in turn lowers financial risks in 19 countries based on income groups from 2004 to 2014. According to the data, rising-income nations have better financial inclusion and stability metrics than low-income nations. Only in countries with rising incomes has financial inclusion been shown to have a significant impact on financial stability. Additionally, in order to lower financial risks and improve financial stability, middle- and upper-middle-income nations must increase their financial development.

Comment on previous studies

Studies that dealt with the application of digital financial inclusion and its relationship to financial risk management have varied. We find that the study of (Yang & Masron, 2024; Aifana et al., 2024; Zhang et al., 2023; Oanh, 2023, Ozil, 2021, Dienillah et al., 2o18) found that the strength of financial risks depends on the ability to apply digital financial inclusion and deal with it in the banking sector. Banks that adopt digital financial inclusion indicators have a greater ability to manage financial risks, confront current crises, and hedge against future crises, which achieves financial stability for them.

Digital financial inclusion was measured through mathematical measures, and the most important variables are represented in many measures, the most important of which are credit cards, debit cards, branches, ATMs, deposits, number of of active mobile money accounts, and banking density…etc. The study relied on the models presented by (Sha'ban. Et al., 2024; Khamons & Besim, 2021; Ahmed et al., 2021). The most important models that the study relied on to estimate the degree of financial stability are the Z-Score index by relying on the models presented by (Zang et al., 2023; Kuznyetsovam et al., 2022; Pham & Doan, 2020; Ahmed & Mallick, 2019), and finally, the models presented by (Yang & Masron, 2024; Mayordomo, 2020; Evans, 2018; Dienillah et al., 2o18) were relied upon to manage financial risks.

According to the above, we also discover that a number of earlier studies have demonstrated the function of digital financial inclusion to financial stability (Dienillah et al., 2018). Financial inclusion can lower risk, increase the base of fixed deposits, lower liquidity risk, and increase the transmission of monetary policy. On the other hand, implications could have a negative effect by increasing the attrition of credit standards like mortgages (Oanh, 2023).

Thus, this study attempts to bridge the gap by conducting an empirical examination of the relationship between financial risk management and digital financial inclusions. In order to mitigate the relationship between financial risk and digital financial inclusions, the search additionally offers financial stability as measured by a bank's Z-Score as a controlling variable. The research has influenced our decision to utilize the bank's Z-Score scale as a measure of financial stability. (Xu et al., 2024; Demirguc-Kunt *et al.,* 2020; Garch & Jose, 2016). We believe financial Stability will help support the Relation between digital financial Inclusions and Financial risk management. Thus, we propose:

H_4. There is no significant effect of Financial Stability in the relationship Between financial Inclusion and Banking Risk Management.

5- Research Design

5.1 Data and samples

Digital financial inclusion has been measured by account ownership at Egyptian Banking Sector by using (Branches, automated teller machines, deposits, credit cards, Banking Density, No. of active mobile money accounts per 1000 adults, No. of Mobile Money transactions per 1000 adults, and GDP) as independent variables. Financial stability by using (Z-score Index) as a controlling variable, and financial risk management (Credit risk, Interest risk, Exchange risk) as Dependent Variable. The research using Egyptian Banking Sector represented by (38) banks include (5) public sector banks, over the period from 2014 to 2023.

5.2 Variable Definition

Dependent Variable: **Financial Risk Management**. Is the process by which the value of an institution is increased by reducing the likelihood of financial distress? In order to measure credit risk, interest rate risk, and exchange rate risk in banks during the study period.

Table (1) indicators used to measure risk management

Dependent Variable	Measurement
Credit Risk	Non-performing loans/ Total Loans
Interest Risk	Total financial assets - Total financial liabilities
Exchange Risk	Net Financial Position/Capital

Independent Variable: **Digital Financial Inclusion**. A model was used to measure digital financial inclusion using a general index made up of a number of sub-indicators (Peric, 2015).

Furthermore, fit is evident from the literature review those measurements of financial inclusion index was not included information about digital finance – an important dimension in defining financial inclusion. Therefore, For the digital index, we thus mix characteristics related to "access," "usage," and "barriers".

- Access

People must be able to readily access or reach formal financial services in order for there to be an inclusive financial system. According to (Lutfi *et al*., 2021) If bank transaction points are easily accessible, then any financial system is broadly accepted in society. Therefore, we use two indicators to measure the accessible of traditional financial services; the Number of ATMs per 100,000 adults and Number of branches per 100,000 adults. Conversely, digital financial inclusion refers to the ability of individuals to access their bank accounts via mobile phones or the internet. Consequently, two indicators were used to evaluate the degree to which individuals can access formal financial services via digital channels. The No. of active mobile money accounts per 1000 adults, and No. of Mobile Money transactions per 1000 adults (World Bank, 2018).

- Usage

A financial system cannot be inclusive merely by providing access to formal financial services; individuals must make use of these services. Traditional banking services can be used for a variety of forms, including payments, deposits, and credit. Thus, we employ three indicators. The number of credit cards per 100,000 adults, the number of deposits per 100,000 adults, and the banking density (United Nations, 2018),

- Barriers

The barriers perceived by the unbanked believe prevent certain people from voluntarily utilizing and accessing traditional formal banking services are essential to assessing the extent of financial inclusion. The two indicators Number of branches per 100.000 adults, No. of ATMs per 100.000 adults (United Nations, 2018),

The overall digital financial inclusion index consists of the following sub-indicators

Table (2) indicators used to measure Digital Financial Inclusion

Independent Variable	Symbol
Branches	BR
Automatic Machine	ATM
Deposits	DE
Credit Cards	CC
Banking Density	BD
No. of active mobile money accounts per 1000 adults	NMA
No. of Mobile Money transactions per 1000 adults	NMT
GDP per capita	GDP

The general index is calculated taking the base year is 2014, and is equal to 100 points, then it is measured in the following years and we note the amount of improvement, positive or negative, in the level of financial inclusion.

Table (3) Data used to calculate the (DFI) index

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
BR	3651	3710	3766	3882	4009	4290	٤٥٩٨	٤٦٤٠	٤٦٣٠	4680
ATM	6.900	7.900	9.800	11.400	12.656	13.33	19.01	21.44	21.975	23.275
DE	821.8	979.7	1111.4	1322.8	1938.7	2765.3	3441.2	4870.7	5622.4	6247.5
CC	2300	2500	3280.7	3859.5	4651.6	4712.8	4833.2	4970.1	5001.5	٥٦٤٠
BD	22.2	22.5	22.9	23.0	23.0	23.3	23.5	23.3	23.5	23.5
NMA	10.06	12.73	15,22	18.31	20.7	24.38	32.9	74.12	107.98	164.2
NMT	8.92	10.93	14.65	15.20	19.18	22.37	24.55	27,74	30.42	32.81
GDP	1924.8	2205.6	2473.1	2674.4	3603	4563.7	5444	5879.6	6336.7	7457.1

Source: Financial Stability Report, for the Years (2014-2023),Annual publications of financial statistics and indicators of the Central Bank of Egypt

- The sub-variables are weighted with equal relative weights, so that their sum is equal to 100%. Therefore, the relative weight of a single sub-indicator is equal to the relative weight of the average share of the sub-indicator in the total value of the sub-variable. Therefore, all variables are evaluated with equal relative weights (100/8 = 12.5).

The sub-index value is calculated by calculating rate of change (index value in current year/ index value in base year) and then multiplying the result by the relative weight of the sub-index. Then values of sub-variables are collected during the comparison year, and the result is compared with the baseline value (100)

From the above, it is clear that the value of the financial inclusion index during the study years was as follows:

Table (4) Digital Financial Inclusion Index

Years	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Index value	100	115.6	124.2	147.3	181.8	212.5	233,6	254.4	271.9	298.2

Based on the above, it is clear that there is an improvement in the level of digital financial inclusion in Egyptian banks, which reflects the annual increase in all variables involved in building the general index of digital financial inclusion in Egyptian banks, such as increasing the number of branches, number of accounts, spread of ATMs, credit cards, etc.

***Control Variable*: Financial Stability**. This is measured by the Financial Stability and Safety Index (Z-Score), which is an early warning device that alerts the banking supervisory authorities to the need to take corrective steps if these indicators show that banks are not moving in the right direction.

Table (5) indicators used to measure Financial Stability

Control Variable	Measurement
Z-Score	(ROA+Equity/Assets/σ ROA))

6- Empirical Results

6.1 Descriptive and Diagnostic Statistics:

The following tables show the descriptive statistics of the research variables.

Table (6): Descriptive statistics of dependent variables from 2014- 2023

Risk Management	OBs	Mean	Minimum	Maximum	Std. Deviation	Skewness	Kurtosis
Credit Risk	380	8.2896	3.200	13.30	3.70550	-.023	-1.650
Interest Risk	380	276.62	-61.00	975.00	269.982	0.914	-0.003
Exchange Risk	380	26.085	20.38	35.39	3.73392	1.059	0.574

** **Source:*** Data processing output using JASP 0.19.1

Table (7): Descriptive statistics of moderating variable from 2014- 2023

Financial Stability	OBs	Mean	Minimum	Maximum	Std. Deviation	Skewness	Kurtosis
Z-Score	380	2.8806	1.43	4.51	1.00313	-0.165	-1.418

**** Source:*** Data processing output using JASP 0.19.1

Table (8): Descriptive statistics of independent variable from 2014- 2023

Financial Inclusion	OBs	Mean	Minimum	Maximum	Std. Deviation	Skewness	Kurtosis
BR	380	3827.60	2498.00	4290.00	347.20	-1.047	2.925
ATM	380	7529.58	3501.00	1234.00	3144.54	0.157	-1.496
DE	380	1945492.2	786000.0	4135400.0	1169997.5	0.657	-1.199
CC	380	2737113.4	1123000.0	5711051.0	1533495.5	0.624	-1.121
BD	380	23.2542	22.00	24.00	0.28580	-1.472	8.359
NMA	380	12.2687	11.60	14.90	0.76022	-0.281	-0.042
NMT	380	64966.6	48098.0	78122.0	9652.60	-0.193	-1.437
GDP	380	2791.28	789.24	3598.97	637.30	-1.323	2.409

**** Source:*** Data processing output using JASP 0.19.1

6.2 Testing Hypotheses:

This section is for investigating the impact of Digital Financial Inclusion on Risk management in light of financial stability as a control variable. In the first, second and third hypotheses, using JASP 0.19.1 to test the collected data to conduct assumption tests, this research mainly used moderated multiple regression analysis.

To determine the appropriate regression model to estimate the effect of independent variables on the dependent variable, curve estimation is performed and based on the knowledge of the best regression curve, the Regression is determined.

This means that alternative hypothesis Ha: β # 0 versus null hypothesis Hb: β = 0, where β is the regression coefficient of the following functions:

- **H_1:** Risk Management = α + β1 (BR) + β2 (ATM) + β3 (DE) + β4 (CC) + β5 (BD) + β6 (NMA) + β7 (NMT) + β8 (GDP) + ε.
- **H_2:** Financial Stability = α + β1 (BR) + β2 (ATM) + β3 (DE) + β4 (CC) + β5 (BD) + β6 (NMA) + β7 (NMT) + β8 (GDP) + ε.
- **H_3:** Risk Management = α + β1 (Z-Score) + ε.

- **First, Second, Third Hypothesis Test:** Multiple regression equations were applied to the independent variables on dependent variable for Egyptian banking sector. The regression results were as follows:

Table (9): Summary of the multiple regression tables and the impact of independent variables on dependent variable

Hyp NO.	Dependent Variables	Model Summary R	Model Summary R^2	ANOVA F	ANOVA Sig	Durbin-Watson	Independent Variables	Coefficients of independent variables β	Coefficients of independent variables t	Coefficients of independent variables Sig
							(Constant)	-	-1.117	0.271
							Branches	419.507	-0.118	0.906
							ATMs	-0.003	-1.992	0.050
(1)	Risk Management	0.739	0.546	59.328	0.006	2.029	Deposits	-0.027	0.966	0.340
							Credit card	2.6702	5.117	0.000
							Banking density	7.5868	0.409	0.684
							Money Accounts	7.887	2.599	0.050
							Money transactions	6.139	0.631	0.531
							GDP per capita	0.002	1.820	0.076
							(Constant)	0.024		
							Branches	2.764	0.954	0.346
							ATMs	0.000	1.058	0.297
(2)	Financial Stability	0.910	0.828	48.020	0.000	1.193	Deposits	0.000	-2.929	0.006
							Credit card	-5.170	-2.426	0.020
							Banking density	-2.854	-0.250	0.804
							Money Accounts	0.367	2.469	0.018
							Money transactions	-0.585	-7.398	0.000
							GDP per capita	0.833	3.469	0.020
							(Constant)	0.000	2.400	0.021
							Financial Stability	319.20	14.505	0.000
(3)	Risk Management	0.837	0.700	107.511	0.021	1.716		-75.032	-10.36	0.000

- The results of tables (9) indicate that represent test ***first hypothesis*** result Digital financial inclusion have explanatory power, as the correlation coefficient ***R*** (0.739), which repair to that is a Significant and negative effect of digital financial inclusion on risk management. A significant also confirms this effect is calculated **F** (59.328), which functions in the significant level (Sig=.000). As the results of (β Coefficients) were the most influential and sensitive independent variables in the dependent variable, the ATMs and Credit Cards was more effective for banking risk management, the results support the rejection of the Zero hypotheses for the first hypothesis and to accept Alternative Hypothesis.

- ***The second hypothesis*** results show that is a Significant & positive effect of digital financial inclusion on Financial Stability, as ***R*** (0.910), which

function in the significant level (Sig > 0.05). As the results were the ATMs, deposits, banking density, Money Accounts, Money transactions, and GDP per capita was more effective for financial stability. This confirming the rejection of the hypothesis.

- ***The third hypothesis*** results represent that is a Significant impact of Financial Stability on Risk Management, as the correlation coefficient ***R*** (0.837), which function in the significant level (Sig= .000). This confirms the validity of rejection of the hypothesis, and therefore accepted the alternative Hypothesis and rejects the Hypothesis Zero.

Regarding the problem of autocorrelation, the Durbin-Watson Test has been conducted and indicates that the autocorrelation problem does not exist, as DW stat value is between 1 and 3.

- ***Fourth Hypothesis Test:*** using Structural Equation Model (SEM) based on maximum likelihood estimation method, by means of instantaneous structure analysis (AMOS) program. To investigate whether there is a direct or indirect impact of digital financial inclusion on banking Risk management in light of existence of Financial Stability as a control variable.

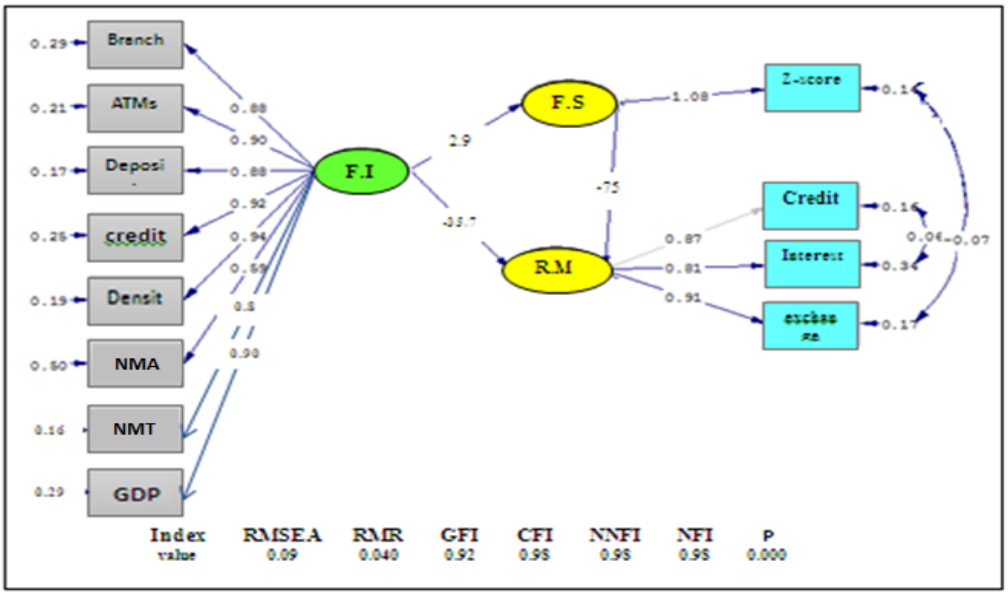


Figure (5): Structural Equation Model (SEM) results of search variables

Figure (5) shows that search model has goodness of fit indices, where NFI, NNFI, CFI, GFI value 0.98, 0.98, 0.98, 0.92 respectively, all agree the conditions required. As indicators of errors were RMR, RMSEA value 0.04, 0.09, all within acceptable levels.

Table (10): Summary of path coefficient:

Hypothesis	Path coefficient	Direction	Sig
Digital Financial inclusion ⟶ Risk management	35.76	-	0.050
Digital Financial inclusion ⟶ Financial stability	2.99	+	0.039
Financial stability ⟶ Risk management	75.03	-	0.000

Table (10) shows that effect of digital financial inclusion on risk management is less than the impact of digital financial inclusion on risk management in light of existence of Financial Stability as a control variable.

According to Table, the equation obtained in this research is [Risk Management = 35.76 Digital Financial Inclusion + 2.99 Financial Stability]. The value of path coefficient shows that the predictive value of digital financial inclusion on risk management has a negative with a value of 35.76, and the value of digital financial inclusion towards financial stability has a positive with a value of 2.99. And the predictive value of financial stability for risk management has a negative trend with a value of 75.03.

As we note from, the statistical value (t-test) of digital financial inclusion towards risk management is 0.050, which is significant value p-value = 0.05, therefore the first hypothesis is accepted.

Also, (t-test) of digital financial inclusion towards financial stability is 0.039, which is significant value p-value = 0.05, therefore second hypothesis is accepted. Also, the statistical value of financial stability towards risk management is 0.000; therefore, third hypothesis is accepted.

The table shows the values of the path coefficient between digital financial inclusion and risk management with financial stability as a control variable as an indirect relationship coefficient with a value of 79.582 (10.711×7.430). This value is greater than the direct relationship between digital financial inclusion and risk management, which is 6.406. Accordingly, Therefore, (financial stability) is a control variable for the relationship between (digital financial inclusion) and (risk management), Therefore, the fourth null hypothesis was rejected and the alternative hypothesis was accepted, which repair to that is a significant effect of Financial Stability in the Relationship between digital financial Inclusion and risk management in Egyptian Banks.

7- Discussion and Conclusions:

This research aims to shed light on digital financial inclusion in Egyptian banks, by studying the impact of digital financial inclusion on financial risk management in light of financial stability in the Egyptian banking sector. Digital Financial inclusion was measured by using indicators (Branches, ATMs, deposits, credit cards, Banking Density, No. of active mobile money

accounts per 1000 adults, No. of Mobile Money transactions per 1000 adults, GDP per capita) as independent variables, in addition to that controlling variable represented in financial stability was measured by Z-Score Index in Egyptian Banking Sector, Also the dependent variable represented in Financial Risk Management was measured by (Credit risk, interest risk, exchange risk) in Egyptian Banking Sector. It was applied during the period from 20١٤ to 2023.

The results indicate that the degree of digital financial inclusion in Egyptian banks has improved, which is consistent with the yearly increase in all variables associated with digital financial inclusion, including the expansion of branches, the distribution of ATMs, credit cards, Banking Density, the number of mobile money accounts per 1000 adults,,,,, etc. Additionally, the results showed that digital financial inclusion had a negative and significant impact on financial risk management in Egyptian banks. This is because expanding innovative financial services and improving the quality of financial services help ensure proper risk management, which in turn improves supervisors' evaluation of financial risk management frameworks to include an integrated vision across all aspects of the framework.

The results showed that there is a positive and significant impact of digital financial inclusion on financial stability in Egyptian banks, as a result of diversifying banking services, as well as increasing the share of the formal financial sector at the expense of the informal sector, which leads to the flexibility of the financial system, and thus achieving financial stability in banks.

The results demonstrated that digital financial inclusion has a positive and significant impact on Egyptian banks' financial stability, as a result of diversifying banking services, because digital financial inclusion diversifies banking services and increases the formal financial sector's share at the expense of the informal sector, which increases the financial system's flexibility and ultimately leads to financial stability in banks. Furthermore, the relationship between digital financial inclusion and financial risk management in the Egyptian banking sector is significantly influenced by financial stability as a control variable.

This is because increasing financial inclusion helps individuals and businesses have better access to financial services by expanding innovative financial services, improving their quality, and implementing efficient financial risk management techniques, all of which reducing risks and boost financial stability. Thus, sustainable economic growth will be ensured by an inclusive digital banking sector, which is anticipated to support financial sustainability during economic crises like the COVID-19 pandemic.

Based on the above, the research recommends the following:

- Individuals should obtain more financial education, while maximizing the benefit of technological progress and contemporary approaches, in order to reach more societal segments, and stimulate technological innovation in the field of financial products and services.
- The government should promote digital financial inclusion by promoting inclusive finance, including policies, initiatives, and institutional and regulatory reforms that eliminate market imperfections, due to its affects economic growth, financial stability and investments, and banks financial performance
- The weak relationship between digital financial inclusion and financial risk indicates to banks that they should expand their agent networks and digitize their existing products and services by deploying artificial intelligence (AI) and machine learning to attract customers from all socioeconomic backgrounds.
- Strengthening financial risk management practices as one of the main lessons gained from the financial crisis, it also suggests that financial and non-financial organizations assist assure sound risk management throughout the economic cycle.
- Increase financial literacy and launching awareness efforts to increase the level of financial culture among adults, and women in specifically.
- Restructuring the administrative data available to banks to build "Big Data" that allows monitoring the development of digital financial inclusion.

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دراسة تأثير الشمول المالي الرقمي على إدارة المخاطر: دراسة تطبيقية علي القطاع المصرفي المصري خلال الفترة من ٢٠١٤ إلى ٢٠٢٣

المستخلص

يهدف البحث إلي التحقق من تأثير الشمول المالي الرقمي علي إدارة المخاطر المالية. كما تسعي أيضاً إلي دراسة دور الاستقرار المالي في العلاقة بين متغيرات الدراسة في القطاع المصرفي المصري. لتحقيق أهداف الدراسة، تم تجميع البيانات من القطاع المصرفي المصري ممثلاً بـ (٣٨) بنكاً خلال الفترة من (٢٠١٤ – ٢٠٢٣). وتم تحليل البياناات باستخدام تحليل الانحدار المتعدد وأسلوب نموذج المعادلات الهيكلية (SEM) بالاعتماد علي (JASP 0.19.1) وبرنامج (AMOS). وأظهرت النتائج أن هناك تأثيراً كبيراً للشمول المالي الرقمي علي إدارة المخاطر المالية. كما أظهرت أن هناك تأثيرا كبيرا للشمول المالي الرقمي علي الاستقرار المالي. وأخيراً، اشارت النتائج إلي وجود تأثيرا كبيرا للاستقرار المالي في العلاقة بين الشمول المالي الرقمي وإدارة المخاطر المالية في القطاع المصرفي المصرى خلال فترة الدراسة. وأوصت الدراسة بضرورة زيادة التثقيف المالي وإطلاق حملات توعية لزيادة مستوى الثقافة المالية بين الأفراد، وتعظيم الاستفادة من التطورات التكنولوجية والأساليب الحديثة، وزيادة انتشار فروع البنوك، وزيادة عدد حسابات الأموال المحمولة النشطة، أن البنوك بحاجة إلى توسيع شبكات وكلائها ورقمنة خدماتها من خلال نشر الذكاء الاصطناعي والتعلم الآلي لجذب العملاء من جميع الطبقات الاقتصادية، وهو ما سينعكس على زيادة الاستثمارات في البنوك المصرية.

الكلمات المفتاحية: الشمول المالي الرقمي – إدارة المخاطر – الاستقرار المالي – القطاع المصرفي المصري