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**ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS (COBE)**

**MANAGEMENT DEPARTMENT**

*The Effect of Financial Technologies (Fintech) on Financial Inclusion of SMEs: Exploring the Mediating role Digital Financial Literacy and Moderating Effect of Perceived Regulatory Support.*

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FOR THE MASTER OF SCIENCE DEGREE IN INTERNATIONAL BUSINESS  
(STRATEGIC INVESTMENT MANAGEMENT)**

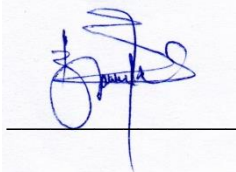
*January 30, 2025,*

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## Declaration

I hereby declare that this thesis entitled “The Effect of Financial Technologies (Fintech) on Financial Inclusion of SMEs: Exploring the Mediating role Digital Financial Literacy and Moderating Effect of Perceived Regulatory Support” has been carried out by me under the guidance and supervision of Dr. Zelalem Gebretsadik. The thesis is original and has not been submitted for any degree or diploma award to any university or institution.

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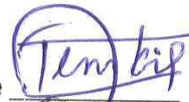
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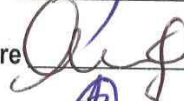
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## DEDICATION AND ACKNOWLEDGMENT

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## **LIST OF ABBREVIATIONS**

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<b>AVE</b>	Average Variance Extracted
<b>DFL</b>	Digital Financial Literacy
<b>EMDEDA</b>	Ethiopian Micro and Small Enterprise Development Agency
<b>FI</b>	Financial Inclusion
<b>FU</b>	Fintech Usage
<b>MSEDA</b>	Micro and Small Enterprise Agency
<b>MSMEs</b>	Micro, Small and Medium Enterprise
<b>PEOU</b>	Perceived Ease of use
<b>PRS</b>	Perceived Regulatory Support
<b>PS</b>	Perceived Security
<b>PU</b>	Perceived Usefulness
<b>SMEs</b>	Small and Medium Enterprises
<b>SQ</b>	Service Quality
<b>TR</b>	Trust

---

## ABSTRACT

With an emphasis on the moderating effect of perceived regulatory support (PRS) and the mediating role of digital financial literacy (DFL), this study examines the effects of financial technologies (FinTech) on the financial inclusion of small and medium-sized businesses (SMEs) in Addis Ababa Ethiopia. Structured questionnaires were used to gather data from 350 manufacturing SMEs in Addis Ababa as part of a quantitative research methodology. To examine the connections among FinTech adoption, financial inclusion, digital financial literacy, and perceived regulatory support, the study uses Partial Least Squares Structural Equation Modeling (PLS-SEM). According to the research, FinTech use greatly improves financial inclusion for SMEs, and the main factors influencing FinTech usage are perceived security, trust, and service quality. A key mediating factor that favorably affects the connection between FinTech adoption and financial inclusion is digital financial literacy. Though statistically significant, perceived regulatory support moderates this connection negatively, indicating that current regulatory frameworks could not adequately support financial inclusion generated by FinTech. The study concludes that harnessing the advantages of FinTech in advancing financial inclusion among SMEs requires raising digital financial literacy and creating a conducive regulatory framework. These findings have important ramifications for financial institutions, FinTech service providers, and politicians that want to improve financial inclusion in emerging nations.

***Keywords:*** *Financial Inclusion, Financial Technologies, Digital Financial literacy, perceived regulatory support*

## CHAPTER ONE

### INTRODUCTION

#### **1.1. Background of the Study**

Even while financial risk has decreased in the previous several decades in both developed and developing nations due to the need for a stricter regulatory framework (Lentner et al., 2020) undeveloped nations still must deal with unequal access to financing. There is still more that governments can do to address the significant policy problem of increasing and improving access to financial services in many nations.

A rapidly expanding body of research worldwide has focused on the benefits of financial inclusion in recent decades, particularly about inclusive economic growth and the fight against poverty. Furthermore, policymakers have focused a great deal of attention on financial inclusion because of its role in fostering innovation, growth, and new business entry, particularly for small businesses that are largely shut out of formal financial institutions because they lack the necessary collateral. Most adults worldwide (about 1.7 billion) do not currently have access to a financial account, despite the significance of financial inclusion to the economy (D.-K. L. Klapper et al., 2018).

Consequently, to reach the unbanked and low-income population, policymakers refocused their attention from financial development to financial inclusion (Johnson, 2012). Various academics worldwide contend that low-income individuals can take advantage of economic opportunities by investing in small and medium-sized enterprises (SMEs) and saving and borrowing through these channels (Sahay et al., 2015) (Demirguc-Kunt et al., 2017)

In addition to factors like intense market competition, inadequate infrastructure, slow customer debt repayment, lack of appropriate property, the status of the nation's economy, low market demand for businesses' goods and services, rival companies' pricing strategies, availability of raw materials, and bank policies, (Enterprises & Country, 2016) states that the main obstacles to the growth of small and medium-sized enterprises in Ethiopia are the lack of funding from lenders, high loan interest rates, and inadequate infrastructure.

Access to financing is the primary factor influencing the expansion of small and medium-sized businesses, and it is one of the fundamental elements in the development of financial inclusion (Triki & Faye, 2012). The situation is different in the African setting, though, as the continent has lagged other continents in terms of the availability of financial inclusion for small and medium-sized businesses (Oshora et al., 2021).

SMEs are disproportionately affected by the large gaps in Ethiopia's financial system, which persist despite numerous attempts to improve financial inclusion. Due to their limited access to official financial services, many SMEs are forced to rely on unofficial finance sources, which are frequently expensive (Nega & Hussein, 2016)

By providing financial services that are more easily available and reasonably priced when compared to conventional brick-and-mortar financial institutions, fintech technologies seek to close this gap. Fintech saw a sharp increase in global investment from USD 19.9 billion in 2014 to USD 41.7 billion in 2018, underscoring the industry's expanding power. According to (Mention, 2019), fintech is becoming recognized as a disruptive factor in financial inclusion strategies that offer underbanked and unbanked communities affordable and easy access to financial services.

According to research, the adoption of mobile payments, digital banking, and other fintech services is greatly impacted by digital financial literacy, which enhances access to financial resources (Grohmann et al., 2018). However, a major obstacle still exists in many developing nations, where most SME owners lack the knowledge and abilities needed to fully utilize fintech solutions, which limits their ability to increase financial inclusion (Demirgüç-Kunt et al., 2020)). For this reason, optimizing the advantages of fintech requires focused education and training initiatives to raise digital financial literacy (Lusardi, 2019).

The perception of regulatory support is a crucial element that impacts the adoption and effectiveness of fintech. Clear and supportive regulatory frameworks may greatly increase SMEs' trust and confidence when it comes to adopting fintech. The adoption of fintech is significantly influenced by the regulatory environment. Financial inclusion services can be promoted by favorable regulatory support for fintech developments (Ediagbonya & Tioluwani, 2023).

## **1.2. Statement of the Problem**

Small and medium-sized businesses (SMEs') financial inclusion is essential to economic growth and development, especially in emerging nations like Ethiopia. Small and medium-sized enterprises (SMEs) are often considered the backbone of the economy, considerably increasing GDP and employment (Beck et al., 2005). By offering a variety of financial products and services that promote inclusive growth, financial institutions play a critical role in expanding financial inclusion, which is vital for improving the lives of underprivileged groups (Demirgüç-Kunt et al., 2020).

However, the financial systems of many African countries remain underdeveloped as compared to other developing economies even though most of these countries have undergone extensive financial sector reforms in the last two decades. Indicators of the use of financial products and services by adults and enterprises in the region show that many challenges remain in building a more financially inclusive financial sector in Africa (Demirgüç-kunt, 2012).

For instance, recent evidence from the Global Findex2 database shows that less than a quarter of adults in Africa have an account with a formal financial institution and many adults in Africa use informal methods to save and borrow. Similarly, many small and medium-sized enterprises (SMEs) in Africa cite access to finance as a major obstacle. Compared to other economies, many firms in Africa lack proper access to a bank line of credit - a major obstacle to firm growth. In addition, other financing sources such as equity markets are underdeveloped (Demirgüç-kunt, 2012).

Access to financing, however, is a major barrier to SME expansion and the second most common issue SMEs in emerging markets and developing nations face when trying to expand their firms (World Bank 2019). Furthermore, SMEs that can create high-quality jobs have the potential to lessen economic disparities (Toran et al., 2019).

According to a study by (Fowowe, 2017), firms that are not credit-constrained expand more quickly than those that are, and the study also suggests that a firm's ability to obtain credit is significantly hampered. binding limits on the expansion of businesses in developing nations, at the business level, indicates that access to financing is associated with faster rates of job growth.

But, since mobile phones and the Internet are so widely used worldwide, there are always opportunities to bank the unbanked and include people who are financially excluded. According to (Maurer, 2012), fintech businesses are increasingly adopting digital platforms because of the digital revolution (Demirgüç-Kunt et al., 2020). Digital financial literacy is a prerequisite for using Fintech services effectively and is a crucial part of education in the digital age (Amnas et al., 2024a).

Perceived regulatory support is just as important to the uptake and efficacy of Fintech as digital financial literacy, People's perceptions of the level of encouragement and the regulatory environment that the government provides are reflected in their perceived regulatory support (Amnas et al., 2024a). Users begin to trust fintech platforms when they believe they are supported and endorsed by the government (Madan & Yadav, 2016). Users are more likely to accept these digital services when they feel confident in a controlled and safe environment (Ediagbonya & Tioluwani, 2023). Prior research (Ageba & Amha, 2006; Hadis & Ali, 2018; Nega & Hussein, 2016) has looked at the supply and demand side factors influencing SMEs' financial inclusion, but there isn't enough information available about the adoption and use of fintech and how that affects SMEs' financial inclusion.

Additional research on Fintech has concentrated on elements associated with the use of Fintech services or their direct impact on financial inclusion (Amnas et al., 2024a; Bajunaied et al., 2023a). Research on the role that digital financial literacy plays as a mediator in the relationship between small and medium-sized businesses' financial inclusion and their use of fintech is lacking, still. By assessing the mediating role of digital financial literacy in this relationship and acknowledging its critical role in Fintech-enabled financial inclusion, this study seeks to close this gap.

Furthermore, prior studies on the perceived impact of regulatory assistance have mostly concentrated on how it directly affects the adoption of Fintech (Madan & Yadav, 2016). As a crucial moderator, perceived regulatory support were investigated in this study. SMEs must comprehend the impact of regulatory backing to enable them to properly use Fintech to fulfill their financial wants. Through an analysis of these dynamics, this research aims to offer a thorough grasp of how digital financial literacy and regulatory support shape the financial inclusion of SMEs through Fintech.

## **Research Question**

The study answers the following key research questions:

- What is the impact of Fintech on financial inclusion for SMEs?
- What role does digital financial literacy play in mediating the relationship between Fintech use and the financial inclusion of SMEs in Ethiopia?
- How does perceived regulatory support moderate the relationship between Fintech use and the financial inclusion of SMEs in Ethiopia?

### **1.3. Objective of the study**

The main objective of the research is to Assess the Mediating Role of Digital Financial Literacy and the Moderating Influence of Perceived Regulatory Support on the use of FinTech and its impact on the Financial Inclusion of SMEs in Ethiopia.

The specific objectives of the study are:

1. To Evaluate the Impact of Fintech Use on the Financial Inclusion of Manufacturing SMEs in Addis Ababa.
2. To Assess the Mediating Role of Digital Financial Literacy in the Relationship Between Fintech use and Financial Inclusion of SMEs.
3. To Examine the Perceived Regulatory Support for Fintech use.
4. To Investigate the Moderating Influence of Perceived Regulatory Support on the Relationship Between usage of Fintech and Financial Inclusion of SMEs

### **1.4. Significance of Study**

This study is important to a wide range of stakeholders, including the economy, financial regulators, SMEs, policymakers, and participants in the Fintech industry. The study's conclusions will guide the creation and application of laws and policies that support Fintech innovation while safeguarding consumer interests and ensuring systemic stability. In addition to influencing practice and policy, this study will offer a basis for future scholarly investigations

into similar processes in other economic groups beyond SMEs. It will promote a better comprehension of the role of Fintech in advancing sustainable development and equitable growth, thereby broadening the scope of financial inclusion research and its practical applications.

<b>Term</b>	<b>Definition</b>	<b>Operationalization</b>	<b>Source</b>
<b>Financial Inclusion</b>	The ability of people and organizations, especially the underprivileged and unbanked, to obtain practical and reasonably priced financial goods and services that satisfy their requirements, including credit, insurance, savings, and payments, is provided ethically and long-lasting.	In this research, the degree to which SMEs may get and utilize financial services made possible by FinTech technologies is a proxy for financial inclusion.	<i>(Demirguc-Kunt et al., 2018)</i>
<b>FinTech Use</b>	The process by which small and medium-sized businesses (SMEs) start utilizing digital financial technology solutions to enhance their operations, such as mobile payments, online banking, crowdfunding sites, or cryptocurrency.	The deployment and use of FinTech solutions by SMEs in their financial transactions and business processes is referred to as FinTech adoption and use for this study.	<i>(Lee &amp; Shin, 2018)</i>
<b>Small and Medium Enterprises (SMEs)</b>	Enterprises with a limited workforce and turnover rate, which varies by nation and sector. SMEs are essential to innovation and economic growth, yet they frequently encounter obstacles when trying to obtain banking services.	In line with the EU's definition of SMEs, the research defines SMEs as companies with less than 250 employees.	<i>(Ayyagari et al., 2011)</i>
<b>Digital Financial Literacy (DFL)</b>	The capacity of people or organizations to efficiently access financial services through digital platforms and tools, including understanding online transactions, mobile banking, digital payment systems, and cybersecurity.	According to this study, digital financial literacy is the capacity of managers or owners of small and medium-sized enterprises (SMEs) to efficiently use digital platforms (such as online lending platforms, e-wallets, and mobile banking apps) to meet their financial demands.	<i>(L. F. Klapper et al., 2015)</i>
<b>Perceived Regulatory Support (PRS)</b>	The perspective held by SMEs regarding the degree to which government rules encourage the utilization of FinTech services. This includes the existence of laws, regulations, and government programs that support the application of fintech.	Perceived regulatory support in this study refers to the perceptions of managers or owners of SMEs regarding how laws and rules help them use FinTech platforms for their companies.	<i>(Gomber et al., 2017)</i>

### 1.5. Operational Definition of Terms

### 1.6. Scope of the Study

The scope of this study involves assessing the mediating role of digital financial literacy and the moderating influence of perceived regulatory support on Fintech's impact on the financial

inclusion of SMEs in Ethiopia. Regionally, the research focused on Addis Ababa, Ethiopia, specifically analyzing the financial inclusion environment for small and medium-sized enterprises (SMEs) within the city. Given the diverse nature of SMEs in Ethiopia, which operate across various sectors such as manufacturing, services, and agriculture, this study concentrated on SMEs in the manufacturing sector. This focus allows for a detailed examination of how Fintech solutions can be tailored to meet the specific financial needs and challenges of SMEs in this sector.

### **1.7. Organization of the Paper**

The paper was structured into five chapters. The first chapter contained the following: an introduction, a problem statement, basic research questions, the study's purpose, significance and scope, and limitations. The second chapter explored the literature and presented an empirical analysis of the works of scholars related to the study.

Chapter three contained the methodology, which defined the research's nature and design as well as the study's participants, data sources, instruments, measurements, and methods for data analysis. The presentation of data, analysis, interpretation, and discussion of the findings were the main topics of Chapter 4. Chapter Five concluded with recommendations, a summary of the study, and a conclusion.

## **CHAPTER TWO**

### **2. REVIEW OF RELATED LITERATURE**

#### **2.1. Financial Technology (Fintech)**

Without financial systems that can serve those in need, (Sahay et al., 2020) stress, they will have to rely on their limited savings to pay for necessities like health care and education, or they will have to invest in small businesses that will only generate meager profits but will not allow them to take advantage of good opportunities. In the absence of such a financial system, economic development will most likely be weaker and income inequality will rise. According to (Joia & Proença, 2022), the term FinTech, or financial technology, describes the technological capacity to integrate financial services and information and communications technology.

Any technologically enabled financial innovation that produces new business models, apps, procedures, or goods and has an impact on financial markets, institutions, and financial service providers is referred to as fintech (Ramlall, 2018). According to (Leong et al., 2017) These developments in technology have the potential to make basic financial services affordable, safe, and available. Additionally, widespread use of FinTech might boost emerging economies by US\$3.7 trillion by 2025 (Manyika et al., 2016).

This broad term addresses several subjects, such as payments and infrastructure, user interfaces, data security and monetization, risk management and financial operations, and payments and investments. According to (Joia & Proença, 2022), financial institutions initially embraced fintech as a means of automating and updating their operating processes.

Fintech platforms, through providing online lending platforms, crowdfunding, and peer-to-peer lending, have made it easier for small and medium-sized businesses (SMEs) to obtain financing. These platforms use state-of-the-art algorithms to assess creditworthiness, enabling SMEs to FinTech solutions that can help SMEs with payroll, invoicing, accounting, and inventory control, among other business processes (Sahay et al., 2020).

### **2.1.1. Drivers of Fintech Adoption.**

FinTech makes it easier to assess the rapid development of financial institutions and the financial system. By advancing technology in basic services and creating new applications for delivery, such as making payments, saving, borrowing, managing risk, and getting financial advice, it has made the consumption of financial services more convenient (Mention, 2019). With digital transformations in other industries, there is an increased demand for technology-based financial solutions by consumers (Azeem et al., 2023).

FinTech businesses provide easy and affordable means for customers to move, borrow, or invest money to satisfy these demands (Manyika et al., 2016). FinTech is now embraced by retail companies and telecom providers developing new ways to offer financial services over their current networks, expanding beyond banking and investment funds. Even while there are many FinTech service providers and their offerings are getting better, only a small number of these services are being adopted widely (Singh et al., 2020). Thus, it is imperative to study the drivers affecting the adoption and use of these services.

Some services remain unused even if FinTech is used. FinTech applications can be utilized in a variety of ways, and several models have been developed to look at user intention, real-world behavior, and technological adoption. One paradigm that describes how humans accept and use technology is the Universal Theory of Acceptance and Use of Technology (UTAUT) model. The model identifies several important variables that affect adoption, such as social influence, effort and performance expectations, and enabling circumstances (Almaiah et al., 2023).

The Technology Acceptance Model (TAM), another model that has been extensively utilized to examine the uptake of Financial Technologies, contends that two important factors influencing a technology's Its perceived utility and perceived simplicity of use are what lead to acceptance and use. The Theory of Reasoned Action (TRA), the Diffusion of Innovations (DOI) model, and the

DeLone and McLean Information Systems Success (DL&ML) model are other models that have been used to examine the adoption of financial technology (Almaiah et al., 2023)

In the literature, previous studies by (Gupta & Dhingra, 2022; Lutfi et al., 2022) have looked at the factors that influence user acceptance of mobile banking. For instance, using the TAM model, the authors (Ntsiful et al., 2022) found that customers' perceptions of trust were the primary factor driving their uptake of mobile banking services. This suggests that increasing user trust could be a key factor in promoting the adoption and use of mobile banking applications.

To promote acceptance and usage, mobile banking services should take security and trust considerations into account, according to several researchers. Perceived security, perceived simplicity of use, perceived utility, perceived trust, and service quality are important variables that affect the adoption and use of Fintech services, according to some studies (Alnemer, 2022; Search et al., 2021).

Since most of the previous research on technology adoption used the most tried-and-true TAM model, it makes sense to base this study's framework on it when examining how well-liked FinTech services are among consumers. It has been demonstrated that the TAM is reliable and effective at forecasting and explaining the adoption of business-to-consumer e-services, Internet-based information systems, online commerce, and information technology. (Singh et al., 2020) Therefore, in this study, we added other dimensions such as Trust (TR), Service Quality (SQ), Perceived Security, and the external determinants of government support, in addition to the fundamental TAM components. These were taken from the most recent literature.

#### **2.1.1.1. Technology Acceptance Model (TAM)**

The idea behind the Technology Acceptance Model (TAM) is to explain why people accept using information technology systems. The purpose of TAM is to give users a foundation for understanding how external influences affect their acceptance of an information system (Singh et al., 2020).

Perceived utility and perceived ease of use are two important characteristics that TAM presents. These variables are thought to be able to predict users' acceptance of information technology. The Technology Acceptance Model (TAM) examines the psychological aspects of technology

use by analyzing user beliefs, intensity, attitudes, and behavioral interactions. The following figure represents the TAM model, according to (Davis, 1989).

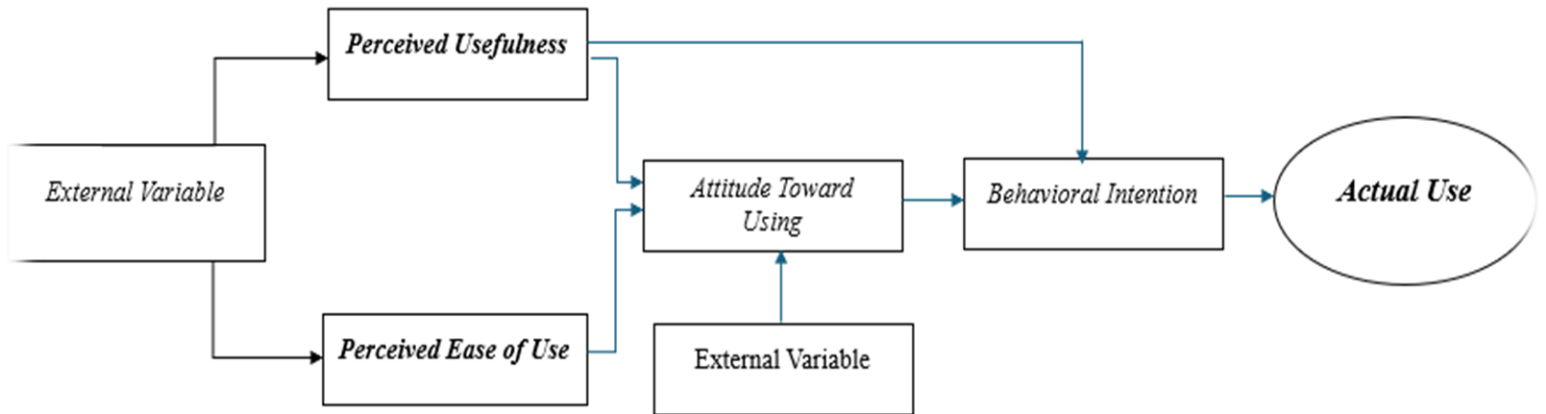


Figure 1 TAM model, according to (Davis, 1989)

Numerous studies centered on the FinTech sector use the Technology Acceptance Model (TAM), a well-liked theoretical framework in the realm of information systems and technology, to comprehend and predict how consumers will adopt and adapt new technologies. (Venkatesh et al., 2012). By categorizing sub-constructs in three dimensions—adoption, behavior, and technology—a lot of research examines the connection between these traits and the implications of FinTech technology (Singh et al., 2020). Because it concentrates on crucial components that accurately anticipate users' acceptance of technology, it is frequently used in research.

We use the Technology Acceptance Model (TAM) as the main framework in our study to gain a better understanding of the factors determining the acceptance of FinTech services. Our conceptual framework is further expanded by incorporating components Such as Trust (TR), Service Quality, and Security as per the recent literature.

### 2.1.1.2. Perceived Usefulness

The extent to which a person believes utilizing a new technology might improve their performance is known as perceived usefulness (Taherdoost, 2018), users' trust and experience may be directly impacted by the planned partial intervention. There is a correlation between FinTech and perceived usefulness, but intention has a major impact on perceived usefulness.

Assessing the problem of those who desire to use cutting-edge technology yet do not view its use positively. Theoretically, perceived usefulness functions effectively since users support apps mostly due to their abilities and capabilities. Additionally, they provide the system's level of complexity in this regard to motivate the framework to carry out those functions (Davis, 1989). This demonstrates that while some features of the system or technology, such as overall perceived usefulness, are related to usage, they are not sufficient on their own to explain utilization in a meaningful way (Adams, 1992).

According to (Saadé & Bahli, 2005), the findings confirm the significance of perceived utility in earlier adoption of things like technical systems. According to (Venkatesh et al., 2012) noted that perceived usefulness similarly influences usage frequency of use and duration. The result of computer anxiety depends less on perceived utility and more on security, satisfaction, trust, and experience. (Albayati et al., 2020; Venkatesh et al., 2012).

### **2.1.1.3. Perceived Ease of Use**

Perceived ease of use was described by (Davis, 1989) as the degree to which an individual believes that using mobile banking for online transactions will be simple. Additionally, employing technology won't need them to put in any extra labor; in other words, it won't make their jobs harder. How easy potential users think the new system is to use depends on how much they expect there to be no difficulties in utilizing it (Sunny & George, 2020).

The level of belief that using an information system is easy and does not involve hard work from the user. Because of this convenience, learning and using information systems require less effort, consideration, and time. When using information systems, people can operate more efficiently than when working manually without them (Putri et al., 2022).

It can also mean the amount of work required to make technology user-friendly (Venkatesh & Davis, 2000). Furthermore, according to the TAM, perceived ease of use is the primary variable responsible for the variation in perceived usefulness. It is proposed that behavior intention to use

technological services is positively and directly impacted by ease of use. (Hanudin, 2007; Venkatesh & Davis, 2000).

When attempting to explain consumer intention and behavior toward the usage of new technology, perceived usefulness and perceived ease of use play a significant role. According to (Wilson et al., 2023) perceived simplicity of use is said to have had a major impact on consumers' adoption of information technology among the elements that explain the acceptability of mobile banking.

In their 2015 study, (Cudjoe et al., 2015) studied the factors that influenced the behavioral intention to use FinTech in the context of an access bank in Ghana, and Nigeria. The findings indicated that perceived ease of use had a positive impact on consumers' intention to adopt this technology in the access bank.

#### **2.1.1.4. Trust**

Customers should feel confident, at ease, and comfortable when utilizing new technology (Jarvenpaa et al., 1999). People are either directly or indirectly encouraged to use new technology by factors like trust, security, and privacy (Matemba & Li, 2018) . The long-term development of social interactions can be managed by a trustworthy system that can adapt to the unavoidable changes in trust (Fortino et al., 2020).

User trust has a big impact on online purchases and other internet-related activities. According to (Albayati et al., 2020; Fortino et al., 2020), this is the most frequent occurrence for novel systems during the development phase. Electronic banking systems were also impacted by user trust, which reduced the risks involved in online financial transactions. By lowering the risk connected to their transaction systems, banks should consider boosting institutional reliance (Kesharwani & Bisht, 2012).

Establishing a strong and trustworthy relationship with customers is crucial for online business strategies. It gives individuals the confidence to use a new medium to interact with the frequently unknown, socially distant service provider without feeling uncomfortable (McKnight et al., 2002). In the connection between the seller and the end user, trust does have a limit. To keep the lines of communication open and functional, it becomes imperative to establish confidence in a business

partner. It is a characteristic of reliable relationships that may reduce the likelihood of dangers (Ratnasingham, 1998).

#### **2.1.1.5. Service quality.**

When a customer compares the perceived and expected levels of service, service quality is determined. As a result, it looks at the differences between what customers anticipate from a service and what they receive (Parasuraman et al., 1985). If the service exceeds the anticipated benefit, the client will be happy. Given that services are intangible, it can be challenging for businesses to comprehend how customers view their offerings. A service provider cannot affect consumer assessments of their service unless they understand how customers rate it. Technology Service Quality is the primary factor that determines an e-commerce business's success (George & Kumar, 2014).

According to (Gefen, 2002) enhanced trust in e-commerce can be achieved by service quality even in the absence of a human service provider. In a similar vein, (Shava, 2021) found that when making purchases via smartphones, service quality had a major impact on trust.

According to (Jasim Alsamydai et al., 2014), among other studies, there is a need to enhance service quality to guarantee trust, as it plays a significant role in fostering consumer pleasure and loyalty. To cultivate a devoted client base, customer happiness is therefore thought to be a good indicator of service quality (Gaire, 2018; Gautam & Sah, 2023a).

#### **2.1.1.6. Perceived Security**

Perceived security is the extent to which a person believes that using a specific financial technology technique will be safe. (Shin, 2009) . Security issues always accompany the introduction of new technologies. To reduce worries when making payments online, it's critical to feel comfortable when doing a financial transaction. Service providers must allay customers' worries and foster a more reassuring atmosphere to encourage mobile payments (Sunny & George, 2020)

The security dimension is comprised of the following, according to (Raman & Annamalai, 2011):

- 1) Security assurances are assured to be free from hazards. This phrase can be used about any type of accident, criminal activity, etc.
- 2) Data confidentiality is the practice of sharing information within a group of people or just one person while keeping it hidden from outsiders.

One of the cutting-edge trust tools for insurance exchanges employing online services to prevent unauthorized access, replication, or disclosure is confidentiality, which is achieved using encryption components (Ratnasingam, 2002). From now on, confidentiality must be strongly considered to perceive security. This ensures that the client's communication with the professional organization is near various groups (Suh & Han, 2003).

Because of the adjustment to the way that the truth is offered in online administrations, the authentication component provides an exchange character of being legitimate, substantial, genuine, real, and deserving of acknowledgment or conviction (Ratnasingam, 2002). As a result, to perceive security, authentication must be decided. According to (Claessens et al., 2002), confirmation needs to address both aspects: information verification and validation. They make clear that components verify, or person participated in a conversation. Information verification ensures that data is accurate at a given moment in time.

The purpose of the authorization tool is to guarantee that clients both possess and have access to protected data (Maijala, 2004). Additionally, this involves guaranteeing that users of online banking applications are authorized to request the framework. As a result, one of the elements influencing the security of online banking services should be authorization.

### **2.1.2. Fintech Adoption and Perceived Regulatory Support**

Open banking is only one of the several FinTech applications. Through application programming interfaces, banks and other financial institutions can give their customers financial data, including account information and transaction history, according to a financial practice and regulatory framework (Omarini, 2018). According to (de Mariz, 2020) the various and inclusive functions that FinTech services which include digital banking, mobile payments, and microfinance play in the current financial environment.

They underline how important regulatory organizations are, especially when it comes to how laws help consumers and develop the FinTech sector. A study on the use of FinTech in open banking was conducted by (Chan et al., 2022). It was discovered that professionals are urged to emphasize the benefits of open banking as well as to identify and manage the perceived hazards and societal influence (Chan et al., 2022).

It is recommended that policymakers concentrate on developing a strong governance structure that fosters confidence in the open banking industry. Transparent communication and cooperative efforts between practitioners and legislators can help ensure that open financial services are adopted more successfully and broadly (Javed, 2020). The idea of government support for fintech is very significant. Government support for FinTech is dynamic and changing, as governments everywhere realize how important it is to promote FinTech innovation, particularly in e-government (Mamakou & Cohen, 2023).

One of the main areas of continued attention is the regulatory constraints that the global FinTech business faces. The development of regulatory sandboxes is one strategy to get around these barriers and encourage the expansion of the FinTech ecosystem. As previously stated, a regulatory sandbox is a "safe space" where companies can test novel goods, services, business plans, and delivery methods without right away having to deal with all of the typical legal repercussions of doing so (Jenik & Lauer, 2017).

A different way to put it is a "framework" established by financial sector regulators to permit private companies to test innovations on a small scale in controlled settings (with the help of a special exemption, allowance, or other time-limited, restricted exception) under the regulator's supervision (Working et al., 2019).

## **2.2. Financial Inclusion**

The term "financial inclusion" has no one approved definition. According to (Beck et al., 2007), most definitions consider three factors: usage, quality, and access. Usage measures how people use financial services, while access shows how well a product meets the needs of its users. "The idea is that finance should be available to as many as possible for a variety of uses accounts to receive income or transfers, savings accounts to store money safely and prudently, credit sources for personal or business borrowings, and insurance products to tide against bad times," according to (Sahay et al., 2015).

Despite the topic's present interest among scholars and regulators, the financial inclusion idea has not yet been defined in a way that is widely accepted. (Town & Africa, 2017). The Center for Financial Inclusion (CFA) defines financial inclusion as the state in which all users have access to a variety of excellent financial services that are easily accessible, priced, and delivered with

respect and dignity. Additional relevant research by (Ilahiyah et al., 2021; Ratnawati, 2020) It is a procedure that ensures underprivileged groups, including low-income and weaker members of society, have equitable and transparent access to suitable financial products and services at fair prices through mainstream institutional actors.

Financial inclusion, on the other hand, was defined by the World Bank as having access to affordable and valuable financial services and products that satisfy everyone's needs for credit, insurance, payments, savings, and other transactions (Sarma & Pais, 2023) provided a further description of the financial inclusion idea, describing It is a process that ensures the formal financial system is readily available, accessible, and used by all members of an economy. Other relevant studies such as (Allen et al., 2016; Ozili, 2018) defined it is the process by which people especially those who are impoverished have access to standard financial services and goods through the official financial system.

According to some other authors in the literature, financial exclusion is the act of preventing certain individuals and social groups from accessing the official financial system (Leyshon & Thrift, 1995). whereas financial inclusion is the exact opposite of financial exclusion, which is the inability of certain socioeconomic groups to access the financial system, regardless of the reason (Carbo et al., 2007). Additionally, study by (Carbo et al., 2007) One practice that prevents underprivileged and impoverished social groups from using official financial systems in their nations is known as financial exclusion. The financial exclusion was described by (Governor, 2007) as the circumstance resulting from certain social groups' inability to obtain suitable, equitable, affordable, and secure financial goods and services from mainstream suppliers. Meanwhile, (Tuesta, 2014) described the financial inclusion system as one that minimizes involuntary financial exclusion while maximizing usage and access.

In light of the different groups and the definitions of financial exclusion and inclusion, this study defines financial inclusion as the condition in which individuals or organizations have easy access to appropriate, reasonable, and practical financial products and services to meet their transactions, including payment, savings, credit, investment, and financial service types at a fair price and in a sustainable way.

### **2.2.1. Access to Financial products and services**

A key component of social inclusion and economic growth is having access to banking services and goods. It includes the use and accessibility of many financial tools and organizations that support lending, savings, investments, insurance, and more. For both people and companies, this access is essential because it gives them the resources they need to manage their money, take advantage of opportunities, and reduce risk (Sahay et al., 2015).

In recent decades, financial services accessibility has improved in African nations. With the development of the financial sector, many African nations now offer a greater range of financial services, particularly credit, to both consumers and businesses. In a similar vein, emerging technologies like mobile money contribute to increasing access to financial services including payment and savings products. Even though most African nations have experienced significant financial sector changes over the past 20 years, their financial systems are still immature when compared to other developing economies (Gabor & Brooks, 2017).

According to (Zins & Weill, 2016), there is a lack of penetration of financial services in Ethiopia and a shallow financial industry. Medium and small business growth is regarded as a crucial tool for creating jobs in Ethiopia since it is strategically placed within the country's Industrial growth Strategy (UNDP 2019). Furthermore, without requiring advanced training, large sums of money, or cutting-edge technology, Ethiopia's SME sector is seen as a tool for bringing about economic change through the efficient use of people's skills and talents, especially those of women and young people (Nega & Hussein, 2016).

Evidence from various empirical studies, however, reveals the opposite outcome, showing that Ethiopia's SME sectors face numerous obstacles that prevent them from expanding quickly, particularly access to financial services and products (Ageba & Amha, 2006; Rao & Baza, 2017). SMEs face greater restrictions on their access to financial services than larger companies, although accounting for a significant portion of the developing private sector in most nations (Beck et al., 2005, 2007). Therefore, a strong SME sector may reflect systemic inefficiencies that either prevent business expansion or make it more advantageous for enterprises to remain small (Beck et al., 2005).

According to recent studies, electronic banking has advanced greatly because of the development of information technology, particularly the Internet (Dhar, 2015). Customers of banks can obtain financial services from any location via Internet banking. Numerous writers concur that the

development of Internet services is directly related to the fintech revolution (Boratyńska, 2019; Gabor & Brooks, 2017). According to empirical data (Menza et al., 2024), Internet banking considerably increases financial inclusion in the underbanked group.

#### **2.2.1.1.1. Payment Services**

Most people give and receive money. People can get paid for their labor, for selling agricultural products, for government transfers or remittances, or other reasons. They pay when they go shopping when they pay their utility bills, or when they send money back to their home country. Adults are using digital means to send and receive money straight from their accounts regularly. In the high-income OECD economies, 95% of account holders made or received at least one digital payment from or into their account in 2014; in the developing countries, 62% of account holders made or received digital payments. These covers payments made over the phone, online, or directly with a debit or credit card (Demirgüç-Kunt et al., 2020).

Still, a lot of payments are done using cash. In developing nations, in 2014, most adults (59%) and those who reported getting payments for the sale of agricultural goods (91%) as well as over half (48%) of those who reported receiving government transfer payments did so in cash rather than into an account. In a similar vein, nearly 90% of the 56% of individuals in developing nations who paid for utilities regularly in 2014 did so with cash (Demirgüç-Kunt et al., 2020).

Access to traditional banking services is made much easier by the growing popularity of mobile technologies, according to recent surveys. Financial innovations like mobile money are crucial for advancing financial inclusion in underdeveloped countries (N'dri & Kakinaka, 2020). However, (Kim, 2022) claims that mobile money gives SMEs in Nairobi access to financial services for quick remittance and payment services as well as a safe way to store money. Accordingly, additional studies have also attested to the beneficial impact of mobile money on financial inclusion (Senyo et al., 2022).

#### **2.2.1.1.2. Credit Service**

Most people occasionally take out loans of money. They might wish to purchase real estate, a home, or invest in a business or education. Additionally, many take out loans to pay for unexpected costs. In the world in 2014, 42% of adults said they had borrowed money in the previous 12 months, excluding credit card borrowing (Beck & De La Torre, 2007). Financial institutions were the most mentioned source of new loans in high-income OECD economies. In every other area, the most typical source of new loans was friends and family. In developing nations, folks borrowed money from friends and family three times more frequently than they did from financial institutions (Demirgüç-Kunt et al., 2020).

In their studies (Demirguc-Kunt et al., 2017) examined the significant transaction costs related to small loan processing, monitoring, and enforcement are a major obstacle to providing credit to SMEs and drive-up breakeven interest rates for these loans. The process of assessing each loan request involves fixed costs that are at least somewhat unrelated to the loan amount, such as legal services, the installation of computer systems in physical branches, regulatory fees, and costs associated with payment and settlement systems.

These ongoing transaction expenses, as mentioned by (Beck & De La Torre, 2007), contrast the interest rates that financial institutions charge borrowers with the costs of funding that institutions incur. Furthermore, lending to SMEs becomes more expensive due to the strong dependence on the lender-borrower relationship (Berger & Udell, 2006).

Particularly in developing nations, SMEs frequently pay higher interest rates and fees than bigger companies since lending to them is more expensive and involves greater risks. According to (Ayyagari et al., 2008), annual checking account maintenance fees vary greatly between nations, with some as high as 20% of GDP/per capita in Malawi, Sierra Leone, and Uganda. A large fraction of firms reports high interest rates as a chief obstacle in accessing finance.

In addition to transaction costs and lending rates, SMEs are constrained by principal-agent problems associated with information asymmetry (moral hazard and adverse selection), which are less prevalent in large firms (Morgan & Pontines, 2018). Adverse selection describes the difficulties in choosing good credit risks ex ante without knowledge of the borrowers' project quality, whereas moral hazard describes the lender's incapacity to successfully enforce the agreed-upon credit contract ex-post because of expensive monitoring or insufficient contracting. (Studies, 2019)

SMEs are either unregistered and lack official documentation, or they lack sufficient records and documentation to apply for a loan. Interest rates cannot be used as screening tools in this situation, as evidenced by (Stiglitz & Weiss, 1981). This is due to interest rates' ability to either negatively affect borrowers' incentives (moral hazard impact) or attract high-risk borrowers (adverse selection effect), which can both affect how risky the loan pool is.

### **2.2.1.1.3. Saving and investment**

Individuals put money aside for future needs such as major purchases, company or educational investments, retirement, and unexpected medical bills. Globally, 56% of individuals in 2014 said they had saved or put money aside in the previous year, including 54% of those living in developing nations. Almost half of savers, or 25% of adults worldwide, reported having made formal savings at a bank or other financial institution in the previous year (Naysary et al., 2021)

A person's tendency to use fintech services may or may not be influenced by his or her financial conduct, specifically his or her borrowing and saving habits. Numerous studies in the literature highlight the importance of mental accounting and examine how people handle and monitor their financial operations (Zhang & Sussman, 2018).

According to (Hastings & Shapiro, 2013) that a person makes judgments based on time- and category-specific budget limitations because they are sensitive to local temporal budget restrictions. In fact, households usually allocate funds or budgets based on the type of expenditure or intended purpose, such as for investments, trips, emergency savings, and weekly gas budgets.

Savings are a crucial financial tool in developing nations, especially for microbusinesses with little access to credit. Even when micro-entrepreneurs have some excess and want to save, they frequently fail to save enough. Potential barriers to saving have been discussed, including behavioral biases like paying insufficient attention and gaps in knowledge (Abebe et al., 2018).

Saving semi-formally, through an informal savings club or an individual outside the family, is a popular substitute for bank account savings in developing nations. A rotating savings and credit association is a popular type of informal savings club (ROSCA). Typically, these associations

function by combining the weekly deposits made by its members and distributing the total sum to a distinct member every week. In developing economies, 10% of people reported semi-formal savings in the previous year in 2014. (Demirguc-Kunt et al., 2017).

However, most savers in developing nations (about half) claim that they save in ways other than through financial institutions, unofficial savings clubs, or relatives. This may include saving in cash at home (“under the mattress”) or saving in the form of jewelry, livestock, or real estate (Naysary et al., 2021)

### **2.3. Financial literacy (FL) and Digital Financial Literacy (DFL)**

The findings of numerous studies in financial literacy point to the lack of a unified method for comprehending the idea. Building a theoretical foundation for the creation of the financial literacy evaluation technique requires a well-defined conceptual framework for comprehending the concept of financial literacy (Ciemleja et al., 2014).

Financial literacy is defined differently by various organizations and researchers, focusing on different elements. Most commonly financial literacy is characterized as financial knowledge (FINRA 2010), financial skills (Kozup & Hogarth, 2008), financial behavior (ASIC, 2011), or a certain combination of factors (Atkinson & Messy, 2011; Hung et al., 2011).

According to (Atkinson & Messy, 2011) break down the idea into three components: budget literacy, price literacy, and money literacy. In their (Ciemleja et al., 2014) states that bank services, debt management, budgeting, savings, and financial negotiations are thematic areas for financial literacy research. Other studies by (Remund, 2010) establishes five classifications: (1) Knowledge of financial concepts; (2) Ability to communicate financial concepts; (3) Ability to handle personal finances; (4) Capacity to make appropriate financial decisions; and (5) Self-assurance in creating effective financial plans.

According to (Belekhova & Kalachikova, 2019) claim that financial literacy encompasses a variety of aspects, with the emphasis being on either the knowledge itself or the capacity to acquire and apply the knowledge. Study by (Dhillon & Padmanabhan, 2024), digital literacy is the ability to

utilize technology to access, generate, analyze, and transmit information. As a result, it requires both technical and cognitive skills to use the technology.

Understanding digital financial products and services, being aware of digital financial dangers, and being aware of consumer rights and redress procedures are only a few of the characteristics of digital financial literacy that the Organization for Economic Co-operation and Development (OECD, 2018) identified. Since each definition necessitates literacy and expertise to be used successfully, it serves as an example of the concepts' diversity and importance.

There are chances to grow financial literacy programs because of the ubiquity of fintech and its effects on the financial services sector. In their study (Mention, 2019) reports that between 2017 and 2018, the global fintech investment jumped from almost \$12 billion to over \$50 billion. According to (Michael Collins & Urban, 2020), the growth of fintech could give people the means to take greater responsibility for their financial security. The circumstances in which an individual can fulfill their financial commitments and see a bright financial future are known as perceived financial well-being (Michael Collins & Urban, 2020). Even with limited access, many adults worldwide possess a digital device of some kind, be it a laptop, tablet, or smartphone. According to a poll, people use mobile applications more frequently than other banking services (Panos & Wilson, 2020).

Online access makes financial information easily accessible, but people frequently lack the digital and financial literacy necessary to make successful use of the applications (Panos & Wilson, 2020). Furthermore, people will not be able to take advantage of the greater accessibility to financial information if they lack a basic understanding of finance (World Bank, 2018). Thus, encouraging and supporting digital financial behavior and education can enhance financial literacy.

#### **2.4.The Definition of Micro, Small, and Medium (MSMEs) Enterprises in Ethiopia.**

Ethiopia classified businesses in 1997 as Micro Enterprises if their total assets were less than 20,000 Birr (\$1200) and Small Enterprises if their total assets were less than 500,000 Birr (\$30,000). Unlike the definition base utilized by the international organization, the total asset is the only base used in this definition. The nation updated its definition of Micro and Small

Enterprises in 2011 (Esubalew & Raghurama, 2020) to bring it into compliance with the definitions of at least a few other nations and international organizations.

Since most enterprises relied solely on family labor and there was a dearth of information about labor availability in the industry, the 1997 strategy document's definition was also focused solely on paid capital or capital investment (Abagissa, 2006). Some of the characteristics that other nations and international organizations utilize are covered in the revised definition. Furthermore, the concept has distinguished between the manufacturing and service industries (Esubalew & Raghurama, 2020).

The primary metrics in the 2011 revision to the definition are assets and human capital. It clarifies the differences in minimum asset needs for services and industries, and it tackles the shortcomings of the 1997 definition. The strategy states that the manufacturing sector's top priorities include textile, apparel, leather, food and beverage processing, metalworking, metal engineering, woodworking, and Agro-processing. Similarly, in the construction industry, the strategy lists subcontracting, traditional mining, cobblestones, building material provision, and infrastructure subcontracting. (Abagissa, 2006).

Wholesalers and retailers of domestic and raw material supplies are another important interaction area that the trade sector has been built to accommodate. The service sector encompasses several industries, including electronics, software development, internet cafés, coffee shops, storage, tourism, management consulting, and beauty salons. (Ageba & Amha, 2004)

In a similar vein, industries like as beekeeping, chicken farming, modern irrigation, and fruit and vegetable production are highlighted as crucial and given the attention they require to meet the government's strategic objectives. This demonstrates how small and micro businesses are divided into the industrial and service sectors. Microenterprises fall within the manufacturing, construction, and mining industry sectors. They are characterized by having five employees, including the owner, and having total assets of no more than Birr 100,000 (Ageba & Amha, 2004)

Microenterprises are those that operate with five people, including the owner, and/or have total assets under Birr 50,000. These types of businesses are under the service sector, which includes retail, transportation, hotel and tourist, ICT, and maintenance services. Small businesses are defined as those that employ six to thirty people and/or have paid-up capital of total asset Birr

100,000 and not more than Birr 1.5 million under the industry sector of manufacturing, construction, and mining.(Ageba & Amha, 2004)

*Table 1 SME Classification in Ethiopia*

Type of Enterprise	Sector	Manpower	Total Asset
<b>Micro Enterprise</b>	Industry	<10	< Birr 100,000
	Service	<10	< Birr50,000
<b>Medium</b>	Industry	>50: <300	< Birr 1.5 million
	Service	>50: <300	< Birr 500,000
<b>Small Enterprise</b>	Industry	>10: <50	< Birr 1.5 million
	Service	>10: <50	< Birr 500,000

*Source* (Abagissa, 2006; Esubalew & Raghurama, 2020)

#### **2.4.1. The Assessment of MSMEs Performances and Challenges in Addis Ababa Ethiopia**

The importance of small and medium-sized businesses to the overall economy is also acknowledged and emphasized by (Oláh et al., 2019). Many firms are SMEs. SMEs account for seven out of ten formal jobs created in emerging markets. When we examine the state of small and medium-sized businesses in Africa, we find that these companies serve as the backbone of the continent, employing around 60% of all workers and accounting for over 90% of all businesses (Durst & Gerstlberger, 2021).

MSEs in Ethiopia can absorb a significant amount of readily accessible labor that is less trained or educated because they are labor-intensive and small businesses. The government is aware of the critical role micro and small businesses play in the growth of the country, especially in terms of lowering poverty and generating employment opportunities. To assist and advance the industry, the government developed an MSE development strategy in 1997. Access to industrial extension (a variety of company development services such as market linkages and technical help), access to working space (shades), access to markets (linkages), access to financing including guarantee provision, and access to technology and training are all included in this support (Abagissa, 2006).

In their research (Abagissa, 2006) looked at One measure of MSMEs' performance is the generation of jobs. When it comes to this, scholars looked at jobs created by MSMEs in the

Lideta Subcity. The findings show with 36.7% of all employment produced, the construction industry leads the other two sectors, with 30.6% of all jobs created in the services sector. Manufacturing, the main industry covered by MSE policy and strategy, comes in third place, accounting for just 16.4% of all employment produced over the given time. With 2.9%, urban agriculture comes in last. Conclusion: Despite receiving more attention and assistance, the manufacturing sector in the sub-city is not producing as many jobs as other sectors.

*Table 2 SMEs Business Sectors*

Business Sectors	Number of Jobs created		Total	
	Permanent	Temporary	No	%
<b>Manufacturing</b>	2,593.00	823.00	3,416.00	16%
<b>Construction</b>	4,957.00	2,722.00	7,679.00	37%
<b>Urban Agriculture</b>	482.00	134.00	616.00	3%
<b>Service</b>	5,181.00	1,231.00	6,412.00	31%
<b>Trade</b>	1,818.00	241.00	2,059.00	10%
<b>Cobblestone</b>		748.00	748.00	4%
<b>Total</b>	<b>15,031.00</b>	<b>5,899.00</b>	<b>20,930.00</b>	<b>1.00</b>

*Source: Lideta Sub-City MSEs Development Agency. (2015)*

Another finding by (Abagissa, 2006) shows how the MSMEs market is developing in the Lideta Sub City. The Lideta sub-city MSEs Development Agency reports that bazaars and exhibitions helped 3,689 MSE members in the sub-city establish a market worth 1,010,106 Birr. Concerning MSMEs' saving situation, the trading sector contributes significantly to the savings amount. This is because the industry profited greatly from government loans at the expense of other industries, particularly the manufacturing industry. The manufacturing sector, which is the focus area, is at a disadvantage relative to the trade sector because savings dictate the amount of loans issued. From this, it follows that future loans will inevitably help the trade sector more than the Manufacturing.

<i>Savings Made by the MSEs Operators</i>		<i>Value of the Market Created for MSMEs</i>	
<b>Business Sectors</b>	<b>Amount Saved in Ethiopia Birr</b>	<b>Business Sectors</b>	<b>Amount Saved in Ethiopia Birr</b>
Manufacturing	6,257,832.00	Manufacturing	6,257,832.00
Construction	4,932,512.00	Construction	4,932,512.00
Urban Agriculture	645,618.00	Urban Agriculture	645,618.00
Service	4,807,642.00	Service	4,807,642.00
Trade	13,916,525.00	Trade	13,916,525.00
Cobblestone	2,510,346.00	Cobblestone	2,510,346.00
<b>Total</b>	<b>33,070,475.00</b>	<b>Total</b>	<b>33,070,475.00</b>

*Source: Lideta Sub-City MSEs Development Agency. (2015). GTP I implementation report, Addis Ababa*

Even though they create jobs and contribute to economic progress, Addis Ababa's micro and small businesses face several challenges that prevent them from expanding and developing. Even though the Lideta sub-city has made progress, there is still a high rate of unemployment there, the number of jobs created by MSEs is not keeping up with demand, and the MSE industry is not growing or creating enough jobs (Abagissa, 2006).

Up until recently, the municipality gave MSEs land to use as workspace. As the number of MSEs increased significantly in recent years, it was noted that the land supply had placed a significant burden on the cities' land resources. The focus has shifted from providing land to offering rental space. Although this kind of approach helps relieve some of the demand on land, MSE operators must bear the financial consequences of it. Even still, many more MSE operators are looking for shade structures constructed by the city to protect MSE operators and their goods than the city can accommodate (Abagissa, 2006).

According to (Toran et al., 2019) However, one of the biggest obstacles to SME expansion and the second most frequent problem SMEs in developing and emerging countries encounter when attempting to grow their businesses is access to finance. Additionally, SMEs that can produce high-quality jobs can reduce economic inequities; the results of (Abagissa, 2006) confirm this assertion. A high interest rate charged by lending institutions, a lack of working capital, and convoluted loan application processes were found to be significant determinants of an

organization's performance. Credit services are provided in accordance with MSE performance, and the quantity of savings achieved during the preceding six (6) months.

Enterprises that are not credit-constrained grow faster than those that are, according to research by (Fowowe, 2017) which also argues that a firm's capacity to get credit is severely limited. A different study on binding limits on enterprises' expansion in developing countries (Dinh et al., 2012) found that access to funding is linked to quicker rates of job development. Lending regulations are stringent since MFIs (microfinance institutions) in Ethiopia are subject to National Bank of Ethiopia (NBE) regulation, inspection, and assessment against good portfolio quality and financial prudence, as both dissertations confirm (Abagissa, 2006) MFIs consequently cannot afford to take chances or serve customers who have inadequate management skills or business potential.

According to (Zins & Weill, 2016), Ethiopia has a small and underdeveloped financial industry with low penetration of financial services. Medium and small business growth is regarded as a crucial tool for creating jobs in Ethiopia since it is strategically placed within the country's Industrial growth Strategy (UNDP 2019).

Furthermore, the SME sector in Ethiopia is seen as a tool for bringing about economic change by utilizing the skills and talents of the populace, especially women and young people, without requiring advanced technology, large sums of money, or specialized training (Nega & Hussein, 2016). Various empirical research, however, provides evidence of the opposite conclusion, suggesting that Ethiopia's SME sectors face numerous obstacles that prevent them from expanding quickly (Ageba & Amha, 2006; Rao & Baza, 2017).

For this research, we took access to finance as a major challenge. We try to examine the financial technologies' contribution to tackling this problem and ensure the financial inclusivity of the firms. In addition to the challenges already mentioned by (Abagissa, 2006). Market issues, operator's issues, and a lack of management and trained workforce skills are additional significant obstacles for MSMEs. These are critical challenges for the enterprise's performance.

## **2.5. Empirical Literature Review and hypothesis development**

### **2.5.1. Direct Effects**

#### **2.5.1.1. Perceived usefulness (PU), Perceived Ease of use (PEOU) and Fintech use**

Perception of usefulness (PU) and perceived ease of use (PEOU) are important determinants of FinTech service uptake. These ideas are based on the Technology Acceptance Model (TAM), which asserts that users' opinions of the technology's utility and usability play a major role in determining whether they embrace it (Davis, 1989). This framework is supported by empirical data in the FinTech setting.

Previous research has suggested that people's willingness to accept technical improvements is greatly influenced by perceived usefulness, which in turn affects how those innovations are used (Gefen et al., 2003a). In their studies (Tan & Leby Lau, 2016) conducted an empirical study to examine the beneficial impact of perceived usefulness on behavior intention about mobile banking services.

Furthermore, earlier researchers discovered that people often assess the effects of their actions and make decisions based on how desirable their perceived usefulness is (Moslehpour et al., 2020). According to previous research, consumers' intentions to adopt fintech have been impacted by its perceived usefulness because it helps individual customers start jobs without making costly mistakes.

Additionally, consumer willingness to adopt fintech is positively impacted by perceived usefulness since they will assess how satisfied they are with the way financial services are conducted using a technology platform (Wonglimpiyarat, 2017). Because consumers in the FinTech industry evaluate their level of satisfaction based on the features and benefits of the system or product, this variable has been the subject of previous research as the most reliable predictor of customer satisfaction (Chen et al., 2016). Therefore, this relationship has been empirically examined, there seems to be a theoretical relationship between perceived usefulness and inclination for adopting FinTech. As a result, the following hypotheses are proposed:

***H1: A positive relationship exists between the perceived usefulness and use of FinTech***

The degree to which a person believes utilizing a technology would be effortless is known as perceived ease of use (Davis, 1989). The amount of work required for a technology to be user-friendly is another definition of it (Venkatesh et al., 2003). Furthermore, according to the TAM, perceived ease of use is the primary variable responsible for the variation in perceived

usefulness. According to (Hanudin, 2007), there is a direct and positive correlation between behavior intention to reuse technology services and simplicity of use.

Over time, this encourages users to embrace technology services. Additionally, it has been discovered that the perception of ease of use improves the prediction of the use of technology services, such as Internet banking (Gounaris & Koritos, 2008) and other IT-related products (Adams, 1992; Gefen et al., 2003a). Given the variety of FinTech service options available, it is possible to assess the impact of perceived ease of use on both behavior intention and actual FinTech service use.

According to a Thai study (Chansaenroj & Techakittiroj, 2015), intention to use mobile banking and perceived ease of use are positively correlated. They concluded that the desire to use mobile banking grows anytime the designed system is user-friendly. Apart from that, a customer's perception of perceived simplicity of use can be summed up as not needing any extra knowledge to operate the new technology. It further stated that the platform aids in the facilitation of online transactions and features an easy-to-use interface with clear instructions.

Additionally, Huei, Cheng, Seong, Khin, and Bin (2018) carried out an exploratory study on FinTech in Malaysia and discovered that customers' attitudes toward the intention to embrace FinTech goods and services may be influenced by how simple they perceive the products and services to be. According to (Huei et al., 2018) empirical research is still required to support this claim. Thus, based on this point of view, this study proposed that:

***H2: A positive relationship exists between the perceived ease of use and use of FinTech.***

### **2.5.1.2. Trust and Service Quality and Fintech Adoption**

Customers should continue to feel safe, at ease, and comfortable when using recently released technology (Jarvenpaa et al., 1999). Consumers are either directly or indirectly encouraged to use new technology by aspects like trust, security, and privacy (Matemba & Li, 2018). For FinTech adoption or internet commerce, trust is essential. Building a relationship of trust with clients motivates them to communicate with them regularly. However, users get apprehensive when socially distant service providers employ a new medium without knowing how to properly interact with their users (McKnight et al., 2002).

According to (McCloskey, 2011), usefulness is greatly increased by the trust. The provision of digital transactional information by financial service providers to their customers enhances their trust, and customers perceive internet-based digital financial transactions as reliable and convenient (McCloskey, 2011).

Research continuously shows that people's desire to use FinTech platforms is strongly influenced by their level of trust (Bajunaied et al., 2023a). This is particularly pertinent to the payment services industry, where it is seen to be essential to maintain a high degree of trust because fraudulent actions are common and can result in financial hazards (Zaid Kilani et al., 2023).

Customers who feel comfortable using FinTech platforms see fewer risks involved (Shahzad et al., 2024). When users trust a platform, they are more likely to stick with it, using its services frequently and even recommending it to others (Bajunaied et al., 2023a). Trust is a crucial component that distinguishes itself among the key influencers of users' attitudes and behaviors toward FinTech services (Zarifis & Cheng, 2022). It lowers perceived risk, boosts user confidence, boosts user loyalty, and encourages positive word-of-mouth (Amnas et al., 2024a). Drawing from the prior empirical evidence, the next hypothesis was developed. Based on the empirical evidence, the following hypothesis was formulated

***H3: A positive relationship exists between trust and use of FinTech.***

According to (George & Sunny, 2023a), the total benefit or superiority of a service in satisfying customer expectations is referred to as service quality. Users' opinions about the caliber of services provided can have a big influence on whether FinTech platforms are accepted and used in the long run (George & Sunny, 2023a).

Service quality and customer satisfaction with FinTech services are correlated (Gautam & Sah, 2023a). Users' perceptions of a FinTech platform's dependability, effectiveness, and fulfillment can have a big impact on how widely embraced and utilized it is (George & Sunny, 2023a). Users are more inclined to employ FinTech services when they feel that they meet or beyond their expectations in terms of quality (Ghosh, 2018).

Secure and reliable services are examples of high service quality, and they have a good impact on users' trust in digital platforms (Amnas et al., 2024a). Pleasant perceptions of service quality foster customer loyalty and sustainable use of FinTech services, while also contributing to

overall happiness and pleasant user experiences (Gautam & Sah, 2023a; George & Sunny, 2023a). As a result, the following hypothesis was framed.

***H4: A positive relationship exists between Service Quality and use of FinTech.***

#### **2.5.1.3. Perceived Security and Fintech Adoption and use.**

Regardless of Internet usage, one major deterrent to doing financial transactions online is users' confidence in the security of the transactions (Gefen et al., 2003b). The primary determinants of perceptions of safety when conducting financial transactions are the security of online transactions and the standing of the service provider (Pavlou, 2003).

Several earlier empirical research (Gerrard et al., 2006; Singh et al., 2020) incorporated security in the TAM. The findings indicate that security is a prerequisite for both usability and simplicity of use (Pavlou, 2003).

According to a (Tseng et al., 2017) survey, security concerns account for 56.2% of Taiwanese people's refusal to utilize mobile banking. In a similar vein, (Ogbanufe & Kim, 2018) note that one of the challenges to FinTech adoption is the rise in cybercrime, as most consumers are uneasy about this security risk. FinTech adoption has long been known to be significantly influenced by security concerns (Taherdoost, 2018).

In their study (Ogbanufe & Kim, 2018) state that one of the core components of settling and processing financial transactions has been the security and confidentiality of personal data. Their research revealed that losing personal data could engender mistrust and impede the uptake of new technology.

Perceptions of security have a direct impact on customer confidence in FinTech platforms (George & Sunny, 2023a). Increased platform stability, which is essential for FinTech use, is a result of high user-perceived security (Iskamto & Juariyah, 2023). If consumers are certain that their financial information is secure, using FinTech services will be less dangerous for them (Jangir et al., 2023). Hence the following hypothesis was proposed, based on the literature mentioned above.

***H5: A positive relationship exists between the perception of security and use of Fintech.***

#### **2.5.1.4. Utilization of Fintech and Financial Inclusion**

FinTech eliminates the need for physical bank branches by enabling consumers in underserved or rural areas to access financial services through digital platforms (Aleemi et al., 2023). Financial services are becoming more affordable and convenient thanks to fintech. FinTech provides peer-to-peer lending and microfinance services to enable people and small enterprises to get financing that they might not be able to get from traditional lenders. In underprivileged neighborhoods, this encourages increased economic activity and entrepreneurship (Amnas et al., 2024a).

To successfully provide social benefits, subsidies, and other forms of financial support to the public, FinTech companies work with the government to create programs for financial inclusion (Asif et al., 2023a). FinTech is utilizing technological wizardry to increase accessibility to formal financial institutions by dismantling the barriers that separate people from them (Aleemi et al., 2023). In the light of the literature mentioned above, the following hypothesis was developed.

***H6: The utilization of FinTech services exerts a significant and positive impact on financial inclusion.***

## **2.5.2. Mediating Effect**

### **2.5.2.1. Digital Financial Literacy and Fintech Use.**

DFL stands for Digital Financial Literacy (DFL) as defined by (Amnas et al., 2024a). Therefore, it stands to reason that the impact of DFL and financial literacy on saving and spending habits will be the same. Furthermore, (Tony & Desai, 2020) discovered that financial inclusion including saving and spending—can be enhanced by the digitalization of the industry.

FinTech platforms offer financial education through articles, videos, and tutorials on their websites or applications. To increase the users' financial literacy, they are deconstructing financial ideas and investment techniques and covering a wide range of helpful subjects (Setiawan et al., 2021). To assist users, in tracking spending, creating objectives, and managing their money more skillfully, some of these applications even include budgeting and financial management features (Uthailiang & Kiattisin, 2023).

These FinTech companies offer individualized financial advice by utilizing artificial intelligence (AI) (Zarifis & Cheng, 2022). Making wise judgments is like having a virtual financial advisor at

your disposal (Gautam & Sah, 2023a). By including gaming aspects, fintech apps make learning about finance enjoyable (Lai & Langley, 2023).

Users can talk with other users, share experiences, ask questions, and exchange knowledge in a community setting that is made possible by FinTech platforms (Amnas et al., 2024a). This sense of community promotes a collaborative learning environment, particularly for those who are unfamiliar with digital financial tools (Amnas et al., 2024a). In the light of the literature mentioned above, the following hypothesis was developed.

***H7: The utilization of FinTech services has a significant and positive impact on digital financial literacy (DFL).***

#### **2.5.2.2. Digital Financial Literacy and Financial Inclusion**

According to research by (Grohmann et al., 2018) Growing levels of financial literacy have a positive effect on the financial inclusion of advanced economic resources. The degree of financial literacy affects financial assistance for access to financing in underdeveloped nations. Better financial inclusion is linked to higher levels of financial literacy, according to research by (Grohmann et al., 2018). Furthermore, as financial institutions expand, financial literacy can support their growth by encouraging the public to use business services more frequently. Many countries can use these connections in their economic strategies to actively encourage financial literacy in addition to creating financial institutions (Grohmann et al., 2018).

Digital financial literacy, according to (Goyal & Kumar, 2021) has a big impact on future studies on financial literacy and its importance as a catalyst for change. Although research on financial literacy and its effects on financial inclusion has been done, this research has only focused on digital financial literacy. Digital financial literacy improves people's capacity to manage possible risks and influences people's view of the risks involved in utilizing digital services in a favorable way (Panos & Wilson, 2020). A favorable attitude toward the formal financial system is influenced by higher levels of digital financial literacy, which also increases confidence in using digital financial services (Lyons & Kass-Hanna, 2021).

According to (Amnas et al., 2024a), digital financial literacy is essential for enabling people to use digital financial services to make well-informed decisions and for promoting their increased integration into the digital financial ecosystem. By promoting increased use of digital services,

enabling people to make informed decisions, increasing security awareness, and improving decision-making in digital transactions, digital financial literacy has a positive impact on financial inclusion (Uthaileang & Kiattisin, 2023). The following hypothesis was put forward considering the earlier empirical research.

***H8. Digital financial literacy (DFL) significantly and positively influences financial inclusion.***

### **2.52.3. Digital Financial Literacy as a Mediator**

According to earlier studies, there is a complex relationship between the adoption of FinTech and financial inclusion. Digital consumer protection served as a mediator in the process from FinTech acceptance to financial inclusion, according to (Amnas et al., 2024a). Similarly, (Amnas et al., 2024a) found that the association between FinTech usage and financial inclusion is mediated by digital marketing.

A thorough review of the literature, however, indicated a research gap since no study had examined digital financial literacy as a mediating factor in the relationship between the usage of FinTech and financial inclusion. According to this report, financial inclusion is impacted by FinTech use both directly and indirectly through increased digital financial literacy.

By providing people with the skills and direction needed to use digital platforms effectively, digital financial literacy greatly supports FinTech-enabled financial inclusion (Panos & Wilson, 2020). To date, however, no study has looked at the indirect pathway of FinTech through digital financial literacy. This contrasts with the well-documented direct effects of FinTech on financial inclusion in the literature. The following exploratory mediation hypothesis was developed in consideration of the body of literature that was available.

***H9. Digital financial literacy mediates the relationship between FinTech use and financial inclusion.***

### **2.5.3. Moderating effect**

#### **2.5.3.1. Perceived Regulatory Support as a Moderator**

A regulatory sandbox is required, and government support through the innovation office enhances the establishment of favorable ecosystems for the Fintech sector (Setiawan et al., 2021). The foundation of Fintech development is government assistance, according to (Jahanmir & Cavadas, 2018). Government support has been linked to the construction of infrastructure,

legislation, and regulations that support the expansion of the fintech sector and improve the development of network connections. Regarding FinTech services, people's subjective perceptions of the level of support, encouragement, and regulatory environment provided by the government are referred to as perceived regulatory support (Amnas et al., 2024a).

According to (Madan & Yadav, 2016), people are more likely to trust FinTech platforms if they believe that authorities are endorsing and supporting them. Users are more inclined to use these digital services when they feel comfortable that their financial transactions are being carried out in a secure and regulated environment (Ediagbonya & Tioluwani, 2023).

Consumer rights and interests are protected by mechanisms and rules, according to the perception of regulatory support (Brown & Pirooska, 2022). Customers are more likely to use FinTech services when they think that authorities are actively keeping an eye on and implementing consumer protection regulations (AlBenJasim et al., 2023).

This assurance encourages those who don't have easy access to traditional banking services to adopt fintech more widely (Otieno & Kiraka, 2023). A significant element in the integration of FinTech services into the formal financial system and the subsequent increase in the number of people using mainstream finance was perceived as regulatory support (Bu et al., 2022). Considering the limited empirical data, the following exploratory moderating hypothesis was developed.

***H10: Perceived regulatory support moderates the relationship between FinTech use and financial Inclusion.***

## **2.6. Conceptual framework**

The framework for this study is taken from the work by (Amnas et al., 2024a) and the conceptual model is mostly built based on the pertinent literature and empirical evidence linked to the topic. Perceived usefulness (PU) and perceived ease of use (PEOU) on fintech adoption are two additional variables we added as per the TAM model, introduced by (Davis, 1987) to make this study unique and investigate the topic more deeply.

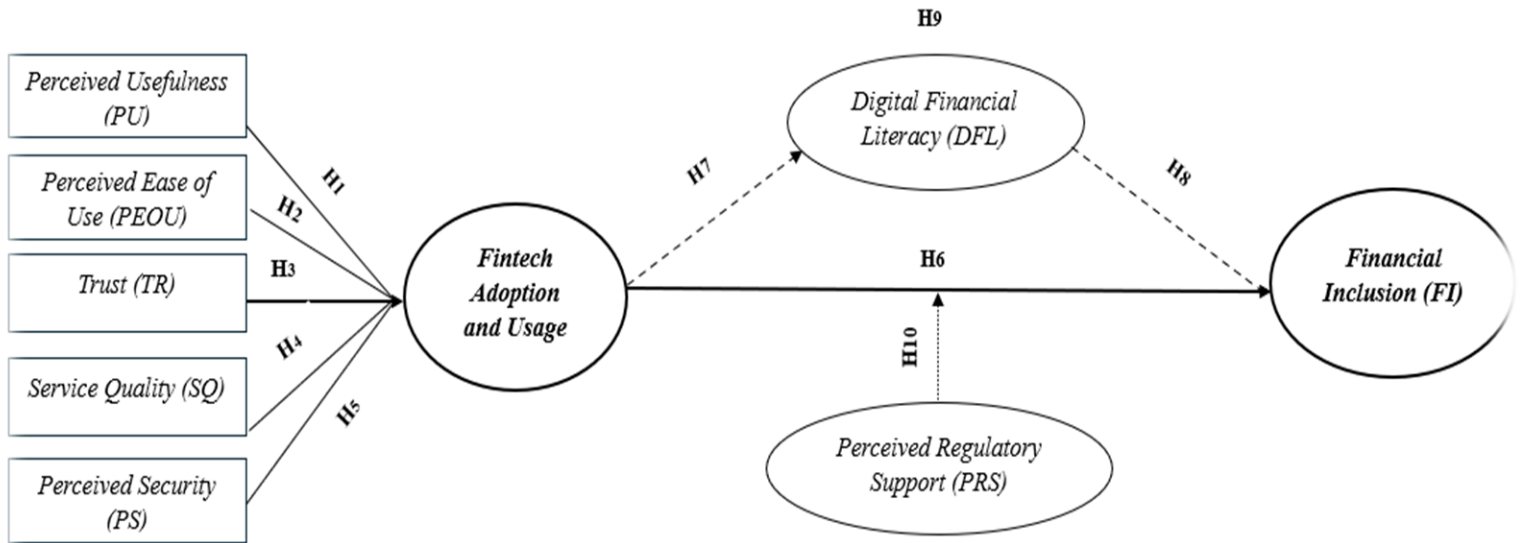


Figure 2: Conceptual Framework. Source (Amnas et al., 2024) and the author.

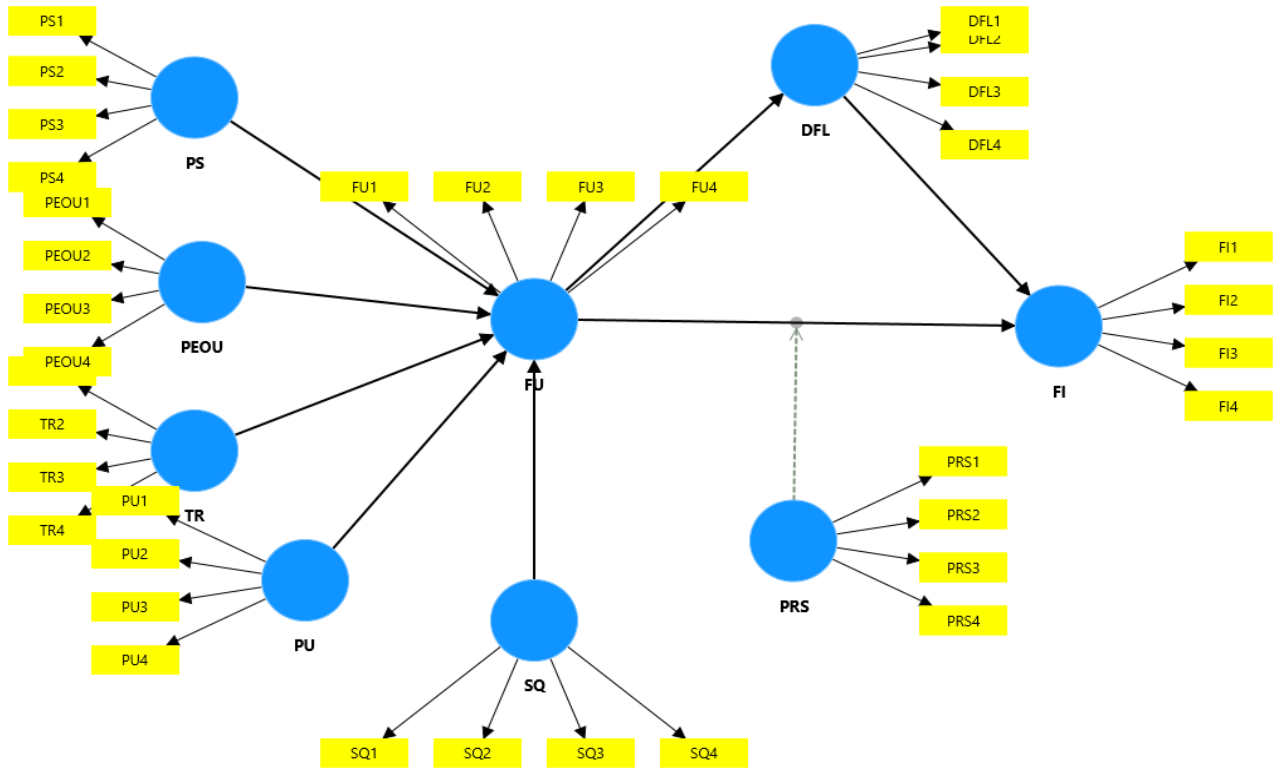


Figure 3: Study model

## CHAPTER THREE

### 3. RESEARCH METHODOLOGY

#### Introduction

This section of the proposal addresses topics of research approaches (qualitative, quantitative, or mixed methods), research design (cross-sectional or longitudinal), research methods (data collection and analysis techniques), target population definition, sampling and sample size determination, that inform pertinent methodological foundation for designing research.

#### 3.1. Target Population and Sampling Technique

From 2018 to 2022, 3954 manufacturing SMEs in Addis Ababa were recorded by the Ethiopian Micro and Small Enterprise Development Agency (EMDEDA). The sample frame for this study were this number. Researchers can utilize online statistical tools like Rao Soft, SS Calc, and Other to determine the sample size for a known population (Abdul & Bukhari, 2020). According to (Chapman et al., n.d.) if all other elements of the sample design remain unchanged, a sample size of 120 respondents specifies a population of 12,000 or 12,000,000 with nearly equal accuracy. Generally, some academicians recommend "ten responses for each question," while others say, "the larger, the better."

According to (EMDEDA) data, there are 3954 manufacturing SMEs in Addis Ababa. The researcher utilized the Bukhari sample size technique to calculate the total sample size. This is because Its foundation is a streamlined methodology like the 1970s Krejcie and Morgan method, which is popular in empirical research. This Excel-based calculator provides a simple method for figuring out the appropriate sample size from a population, guaranteeing statistical analysis accuracy. the Bukhari sample size method. indicates. A total of 350 manufacturing SMEs were included in the sample, and according to the remark made by (Chapman et al., n.d.) this number accurately defines the whole population.

According to the allocation for each of the eleven sub-cities, as indicated in Table 3 below, a questionnaire was sent to every sample member. The sample was specifically made up of Addis Ababa's manufacturing SMEs. A UNDP working paper study from 2023 that highlighted the rise in Addis Ababa's manufacturing SMEs' share in comparison to other regions served as the basis for this decision. 33 percent of manufacturing SMEs in 2017 were in Addis Ababa, compared to

30 percent in the Oromia area, 12 percent in the Tigray region, and 14 percent in the Amhara region. The share of the Amhara area dropped to 12 percent by 2022, the share of the Tigray region dropped to 9 percent, the percentage of the Oromia region dropped to 27 percent, and the share of Addis Ababa rose to 38 percent. This indicates that the percentage of manufacturing SMEs is larger than that of other sectors.

The SMEs must be actively involved in the manufacturing sector in order to meet the first condition. Targeting SMEs, the second criterion described the existence of manufacturing SMEs in Addis Ababa, Ethiopia. The sample that was chosen was typical of the manufacturing SMEs population. Managers, department heads, operational staff, and anyone with a significant involvement and knowledge of SMEs were given a questionnaire. Eleven Ethiopian sub-cities in Addis Ababa received the questionnaire.

### **Research approach and design.**

To investigate the links between different constructs, this study employs a quantitative research methodology, more precisely a cross-sectional data gathering method. Quantitative data was used to analyze the study's findings, with an emphasis on statistical analyses and numerical measurements (J.F. et al.,2020). A quantitative technique is frequently chosen while conducting research on Small and Medium-sized Enterprises (SMEs) in the business sector to measure and assess the relationships between the constructs under investigation (Yadegaridehkordi et al., 2023). This method enables the testing of hypotheses, statistical analysis, and the drawing of conclusions from numerical data (J.F. et al.,2020).

To collect data on the characteristics of interest and investigate their relationships within a certain timeframe, the researchers used a cross-sectional design, which suggests that the data were collected and analyzed for a specific period and cannot predict findings across time. The researchers used the deductive technique, which starts with a theory and then collects evidence to prove it. Modified versions of previous research' questionnaires were used to gather primary data.

A random sampling procedure was used to choose the 350 respondents that made up the overall sample, considering random sampling is a popular sampling technique for quantitative investigations using survey instruments, the researcher was employing it in this investigation. It

is claimed that among populations that are homogeneous and uniformly picked, simple random sampling is advantageous (Noor & Tajik, 2022). However, in an ideal world, these randomization methods would offer each member of the population an equal chance of being chosen for the sample (Stockemer, 2018). It is also an unbiased and impartial selection method, when cautiously designed, the sample can be representative of the whole population (Sharma, 2017).

In their studies (Stockemer, 2018) asserts randomization can assist in reducing the confounding effects of both known and unknown factors by selecting cases at random. This could result in a more thoughtful sample selection procedure for the study. The study focused on managers, heads of departments, and operational personnel in Addis Ababa's manufacturing SME entrepreneurs. Surveys were dispersed and gathered throughout the region's sub-cities.

Bukhari Formula for known population (Abdul & Bukhari, 2021)

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left( \frac{z^2 \times p(1-p)}{e^2 N} \right)}$$

Bukhari Sample Size Calculator (Abdul & Bukhari, 2021)

Confidence Level	95%
Sample Proportion (p)	0.5
Margin of Error (e)	0.05
Population Size (N)	<b>3954</b>
Alpha divide by 2	0.025
Z-Score (z)	1.96
Sample Size	<b>350</b>

The SMEs must be actively involved in the manufacturing sector in order to meet the first condition. Targeting SMEs, the second criterion described the existence of manufacturing SMEs in Addis Ababa, Ethiopia. The chosen sample is typical of Addis Ababa manufacturing SMEs.

Table 3: Response rate category of sample

Response rate category of sample			
Sub-city	The Sample Size	The Sample proportion	Proportion of Total SMEs
Yeka	356	33	9%
Bole	138	13	3%
Lemikura	268	25	7%
Kolfe Keranio	209	19	5%
Addis Ketema	732	67	19%
Akaky Kaliti	421	39	11%
Arada	220	20	6%
Gullele	629	57	16%
Kirkos	365	34	9%
Lideta	315	15	8%
Nifas Silk-Lafto	301	28	8%
<b>Total</b>	<b>3954</b>	<b>350</b>	<b>1</b>

### 3.2. Measurement Development

To achieve the objectives of this study, a research framework was developed; Figure 2.2 shows it. Nine factors were used in this study; the variables were evaluated using various items that were modified from the body of current literature. Items modified from (Fernando et al., 2018) was used to measure the variables of perceived usefulness (PU) and perceived ease of use (PEOU). Items from (Amnas et al., 2024a; Fernando et al., 2018) was used to evaluate trust.

Perceived security perceived regulatory support, and service quality were measured using the metrics from (Amnas et al., 2024a). Items relating to financial inclusion were taken from (Amnas et al., 2024a) while the items used to measure digital financial literacy were modified from those developed by (Ravikumar et al., 2022a).

The variables used in this study were modified to fit the research environment and evaluated using a variety of items that were taken from the body of current literature. Items taken from (Amnas et al., 2024a) were used to measure FinTech usage. FinTech platforms are mainly used by users for four categories of services: credit, investment, payment, and savings services. The items from (Amnas et al., 2024a) are used in this study to measure these four service kinds, and these four services were also chosen to measure financial inclusion.

All assessment items were evaluated using a seven-point Likert scale ranging from "strongly disagree" to "strongly agree." Both sections of the questionnaire were intended to collect respondents' thoughts about each variable in the study model, with the first component serving as a means of collecting demographic data. We were obtaining respondents' informed consent before collecting data and reassure them that their responses remained anonymous. We collected data while abiding by ethical rules.

To avoid any potential restrictions arising from such features, we took into consideration factors like language usage, potential ambiguity, and terminology appropriateness for the intended audience. Two surveys were made, one in English and one in Amharic.

### **3.3. Data Collection and Estimation Techniques**

A standardized questionnaire that was modified from earlier studies on Fintech and financial inclusion was used to gather data. Managers, department heads, operational staff, and other members of Addis Ababa's SMEs were personally given questionnaires. Data were gathered via mail-delivered surveys in cases where the respondents preferred not to be personally visited. To acquire replies from the sampling frame and verify that all participants gave their full consent for this study, we used random sampling. Between September 2024 and December 2024, the researchers scheduled a visit and collected a survey. Respondents were not compensated in any way, and the survey was entirely voluntary.

The normality criterion is not required for the software and method used because we used PLS-SEM through Smart-PLS. Since it was a quantitative study, as was previously mentioned, factor loading, composite reliability, Cronbach's alpha, and average variance extracted (AVE) were used to assess the validity and reliability of the questionnaire's items. The questionnaire was divided into two sections: the first piece included demographic data, and the second section included data pertaining to every variable in this paper. A seven-point Likert scale with structured items and constructs made up the survey questionnaire. We used the Smart-PLS 4.4 software for this study's analysis.

We used convergent and discriminant validities, the Fornel-Larcker Criterion, the HTMT matrix, regression analysis (R-squared values), f-squared values, and projected indirect and direct links to validate the measurement and structural models. Using factor loading, Cronbach's alpha,

average variance extracted, and composite reliability, the measurement model the outer model between observable and unobserved variables—is assessed for convergent validity.

However, the Fornel-Larcker Criterion, the HTMT matrix, the average variance retrieved, and the cross-loading are used to validate the discriminant validity. As a result, our changed outer model (measurement model) is validated concurrently with the modified items and constructions.

The structural model, on the other hand, is an internal model that contains independent, dependent, and indirect variables. Regression analysis (R-squared values), f-squared values, predictive relevance Q<sup>2</sup>, and proposed indirect and direct linkages are used to validate the structural or inner model. As a result, Smart-PLS 4.4 is used to validate the full redesigned model of the study utilizing measurement and structural models. Additionally, we used the bootstrapping method using 5000 bootstraps to measure the mediation model. Previously unavailable in Smart-PLS 3.0, the mediation feature is now integrated into Smart-PLS 4.4 software. By default, the bootstrapping technique is calculated by smart-PLS 4.4.

### **3.4. Data Analysis**

Smart PLS 4.4, a statistical tool, was used in this study to analyze the data using partial least square equation modeling (PLS-SEM). The justification for picking this analysis approach is based on the data/sample attributes and the moderation and mediation analysis. Likewise, this methodology has become increasingly popular in research on marketing, human resource management, and related domains (Iqbal et al., 2021).. Partial least squares structural equation modeling, a component-based technique for predicting intricate cause-effect linkages in route models with latent variables, is recommended in a different study by (Karnadi, 2023a) In contrast to covariance-based techniques (CB-SEM), it is a second-generation multivariate data analysis methodology within the structural equation modeling family.

A PLS-SEM model's components and indicators can be assessed based on two criteria: measurement model validity and reliability. Reliability is the degree to which the indicators and constructs are reliable and consistent in their measurement, whereas validity is the degree to which they measure what they are intended to assess (Karnadi, 2023a).

According to (Hair et al., 2019a) PLS-SEM provides various advantages over other approaches. PLS-SEM is a nonparametric method that can handle complex models with numerous constructs,

indicators, and relationships. It can also work with non-normal or skewed data (no distribution assumptions), and depending on the model complexity and effect sizes, it can accommodate both small and large sample sizes. It may make use of primary or secondary data, neither of which has a thorough justification based on measurement theory. Like this, (Karnadi, 2023a) proposed utilizing PLS-SEM to forecast the impacts of dependent variables. This method is appropriate for simultaneously predicting a set of equations for the given research model and develops the link between variables. PLS-SEM is a proven reporting approach used in this study to do robust analysis.

Furthermore, according to (Karnadi, 2023a) SmartPLS is a software program used to carry out partial least squares structural equation modeling (PLS-SEM). With its user-friendly and intuitive graphical user interface, SmartPLS integrates cutting-edge techniques (including PLS-POS, IPMA, and Complex bootstrapping processes) with a variety of applications, including data exploration, theory testing, prediction, and measurement model assessment. We conduct data analysis using the most recent version of Smart PLS, based on the empirical evidence mentioned above.

### **3.5. Data Treatment**

One crucial phase in the research process is the examination of hypotheses. It enables researchers to ascertain whether their results validate their original theories. Hypotheses can be assessed using a variety of techniques, each with pros and cons.

The following techniques were employed in this paper to assess our hypotheses:

**One-dimensionality:** We evaluated our constructs' one-dimensionality using the Cronbach's alpha coefficient. An indicator of internal consistency, Cronbach's alpha shows how closely a scale's items measure the same notion. An appropriate Cronbach's alpha is 0.7 or more.

**Composite reliability:** To evaluate the reliability of our structures, we also employed CR. The degree to which a scale's items assess the same construct is measured by CR. A CR of 0.7 or greater is regarded as appropriate.

**Content validity:** The exploratory study and pre-tests were used to evaluate the content validity of our conceptions. The degree to which a scale's items accurately reflect the construct it is designed to assess is known as content validity.

**Convergent validity:** The average variance extracted (AVE) is used to evaluate convergent validity. AVE calculates the extent to which a construct's indicators account for its variance. Every construct's AVE need to be higher than 0.5.

**Discriminant validity:** This is evaluated by contrasting the correlations between the constructs with the square roots of the AVEs for each construct. This is determined by taking the square roots of the AVEs, which ought to be higher than the correlations between the constructs.

**Harman's one-factor test:** This is used to determine how likely common method bias is. It happens when a study's findings are impacted by the data collection strategy. One statistical tool for detecting common method bias is Harman's one-factor test.

**Pearson's determination coefficient (R<sup>2</sup>):** This fits the data to the measurement model using Pearson's (R<sup>2</sup>). The model's fit to the data is gauged by its R<sup>2</sup> value. A high R<sup>2</sup> means that the model does well in terms of fitting the data.

**Relevance or predictive validity (Q<sup>2</sup>):** To evaluate the model's fit, we also employed relevance or predictive validity (Q<sup>2</sup>). The model's ability to predict the dependent variable is gauged by Q<sup>2</sup>. A high Q<sup>2</sup> score indicates that the model does a good job of predicting the dependent variable.

**Effect size (f<sup>2</sup>):** Additionally, we evaluated the model's fit using effect size (f<sup>2</sup>). The magnitude of the independent factors' impact on the dependent variable is shown by the f<sup>2</sup> value. The dependent variable is considerably impacted by the independent variables when the f<sup>2</sup> is high.

**Variance accounted for (VAF):** This is how the mediating impact is tested and categorized. VAF calculates the extent to which the mediating variable can account for the variability of the exogenous variable. The dependent variable is considerably predicted by the mediating variable when the VAF is high. Our hypothesis evaluation's findings showed that our theories were validated. Our model's constructs were valid, dependable, and one-dimensional. The mediating impact was considerable, and the model suited the data well.

## CHAPTER FOUR

### 4. RESULTS AND DISCUSSION

#### 4.1. Respondents Demographic Characteristics

As shown in Table 4. 350 General managers, department heads, and operational personnel from manufacturing SMEs participated in the survey. There were 187 female respondents, or 53% of the total, and 163 male respondents, or 47% of the total. Consequently, the outcomes rely on the female participants. The fact that 34% of them have worked in the textile and clothing sector indicates that Ethiopia's textile and clothing sector has grown recently due to high demand from both domestic and international markets. Most SMEs (57%) had 1–5 employees, while 15% had 6–19 and 20–100.

*Table 4: Demographic Data of respondents*

<b>Demographic Variable</b>	<b>Groups</b>	<b>Frequency</b>	<b>Percent</b>
<b>Gender</b>	Male	163	47%
	Female	187	53%
<b>Experience</b>	Less than 5 years	106	30%
	6-10 years	111	32%
	11-15 years,	92	26%
	More than 15years	41	12%
<b>Position</b>	General Manager	167	48%
	Lead of department	145	41%
	Operational employee	32	9%
	Others	6	2%
<b>Industry</b>	Clothing and textiles	120	34%
	Processing of food and beverages	51	15%
	Leather and leather goods	48	14%
	Engineering and metalworking	54	15%
	Furniture is made of wood.	44	13%
	Customary jewelry and handicrafts	10	3%
	Agricultural processing	8	2%
	Production of construction	8	2%

	materials		
	Others	7	2%
<b>Firm Size</b>	1-5employee	201	57%
	6-19 employees	51	15%
	20-100 employees	52	15%
	More than 100 employees	46	13%
<b>Educational level</b>	Bachelors	54	15%
	Masters	278	79%
	PhD	12	3%
	Others	6	2%
<b>Age</b>	20-30 year,	37	11%
	31-40 years	119	34%
	41 - 50 years,	164	47%
	More than 51 years	30	9%

## 4.2. Descriptive Statistics

Table 5 below displays the findings of the descriptive statistics. According to the study's findings, respondents generally agreed with the claims, as indicated by the average scores for the items above 4. These findings are further supported by the median values, which are likewise over 4. The study suggests that respondents had a favourable opinion of fintech usage and digital financial literacy, which help their companies obtain financing. The respondents' mean score of 4 indicates that they are neither in agreement nor disagreement with the study questionnaires' contents. Finally, a mean score of less than 4 suggests that respondents do not have a favourable opinion of the items on the surveys. The data distribution appears to be skewed to the left, according to the skewness score of -0.160. Conversely, the excess kurtosis value of -0.590 indicates that the distribution is flatter than what would be considered typical.

*Table 5: Descriptive Statistics*

	Mean	Median	MIN	MAX	SD	Excess kurtosis	Skewness	N	p value
<b>FI1</b>	4.509	4.000	1.000	7.000	1.343	-0.168	-0.160	350.000	0.000
<b>FI2</b>	4.474	4.000	1.000	7.000	1.306	-0.128	-0.187	350.000	0.000
<b>FI3</b>	4.486	4.000	1.000	7.000	1.428	-0.275	-0.311	350.000	0.000
<b>FI4</b>	4.054	4.000	1.000	7.000	1.587	-0.590	-0.137	350.000	0.000
<b>FU1</b>	4.669	5.000	1.000	7.000	1.428	-0.309	-0.396	350.000	0.000

<b>FU2</b>	4.086	4.000	1.000	7.000	1.675	-0.817	-0.044	350.000	0.000
<b>FU3</b>	4.029	4.000	1.000	7.000	1.309	0.057	-0.199	350.000	0.000
<b>FU4</b>	4.383	4.000	1.000	7.000	1.457	-0.467	-0.212	350.000	0.000
<b>DFL1</b>	3.906	4.000	1.000	7.000	1.660	-0.696	-0.064	350.000	0.000
<b>DFL2</b>	4.040	4.000	1.000	7.000	1.848	-1.022	-0.048	350.000	0.000
<b>DFL3</b>	3.783	4.000	1.000	7.000	1.569	-0.646	-0.034	350.000	0.000
<b>DFL4</b>	4.206	4.000	1.000	7.000	1.521	-0.400	-0.131	350.000	0.000
<b>PRS1</b>	3.709	4.000	1.000	7.000	1.699	-0.791	0.065	350.000	0.000
<b>PRS2</b>	5.223	5.000	1.000	7.000	1.368	-0.566	-0.374	350.000	0.000
<b>PRS3</b>	5.143	5.000	2.000	7.000	1.347	-0.842	-0.213	350.000	0.000
<b>PRS4</b>	5.117	5.000	1.000	7.000	1.378	-0.549	-0.317	350.000	0.000
<b>PEOU1</b>	5.160	5.000	1.000	7.000	1.429	-0.360	-0.549	350.000	0.000
<b>PEOU2</b>	5.177	5.000	1.000	7.000	1.478	0.031	-0.681	350.000	0.000
<b>PEOU3</b>	4.654	5.000	1.000	7.000	1.496	-0.284	-0.460	350.000	0.000
<b>PEOU4</b>	5.169	5.000	1.000	7.000	1.387	-0.153	-0.653	350.000	0.000
<b>PS1</b>	3.769	4.000	1.000	7.000	1.646	-0.863	0.011	350.000	0.000
<b>PS2</b>	4.634	5.000	1.000	7.000	1.486	-0.461	-0.331	350.000	0.000
<b>PS3</b>	4.971	5.000	1.000	7.000	1.573	-0.515	-0.475	350.000	0.000
<b>PS4</b>	4.269	4.000	1.000	7.000	1.585	-0.623	-0.257	350.000	0.000
<b>PU1</b>	4.846	5.000	1.000	7.000	1.354	-0.073	-0.543	350.000	0.000
<b>PU2</b>	4.500	5.000	1.000	7.000	1.562	-0.947	-0.201	350.000	0.000
<b>PU3</b>	4.771	5.000	1.000	7.000	1.367	-0.549	-0.168	350.000	0.000
<b>PU4</b>	4.531	4.000	1.000	7.000	1.395	-0.508	-0.100	350.000	0.000
<b>SQ1</b>	4.151	4.000	1.000	7.000	1.317	0.110	0.103	350.000	0.000
<b>SQ2</b>	4.449	4.000	1.000	7.000	1.312	-0.007	-0.093	350.000	0.000
<b>SQ3</b>	4.231	4.000	1.000	7.000	1.440	-0.436	-0.163	350.000	0.000
<b>SQ4</b>	4.994	5.000	1.000	7.000	1.758	-0.458	-0.694	350.000	0.000
<b>TR1</b>	4.580	5.000	1.000	7.000	1.492	-0.703	-0.231	350.000	0.000
<b>TR2</b>	4.711	5.000	1.000	7.000	1.326	-0.372	-0.085	350.000	0.000
<b>TR3</b>	5.209	6.000	1.000	7.000	1.671	-0.277	-0.764	350.000	0.000
<b>TR4</b>	4.317	4.000	1.000	7.000	1.396	-0.149	-0.117	350.000	0.000

### 4.3. The PLS-SEM Algorithm and Bootstrapping.

The PLS-SEM approach was used in the study to analyse the data. Regression analysis can be effectively performed with PLS-SEM to assess the intricate link between the constructs. The non-parametric nature of PLS-SEM eliminates the need for a large sample size and the assumption of normalcy (Hair et al., 2011). This multivariate method evaluates the structural model and measurement with minimal error variance. PLS-SEM is appropriate since it depicts and validates the relationship between the constructs at the same time (Hair et al., 2020). The structural model was evaluated by a bootstrapping technique that employed 5000 resampling.

There are two parts to a structural equation model with latent constructs. The structural model, which illustrates the connections between the latent constructs, is the first element. There are no causal loops in PLS-SEM; only recursive interactions are permitted. This demonstrates that there is only one possible direction for the structural paths connecting the latent components. The structural model includes endogenous components that are explained by other constructs through relationships, as well as exogenous constructs that have no linkages pointing to them.

The measurement model, frequently referred to as the outer model in PLS-SEM, is the second part of the structural equation model. The predicted connections between each latent concept and its observable indicators are included in these models. Since multiple relations are not allowed, each indicator variable is linked to a single latent construct. It demonstrates that formative and reflective measurement models may be handled by PLS-SEM. It is believed that reflective indicators reflect the latent construct, and that variations in the construct cause variations in the variables that serve as indicators. These relationships' coefficients are referred to as outer loadings, and reflective indicators are depicted as arrows extending from the latent construct to the indicator variables. Conversely, the latent variables are thought to be caused by formative markers. Formative indicators are shown as arrows leading from the indicator variables toward the latent construct, whereas the coefficients for these relationships are referred to as outer weights.

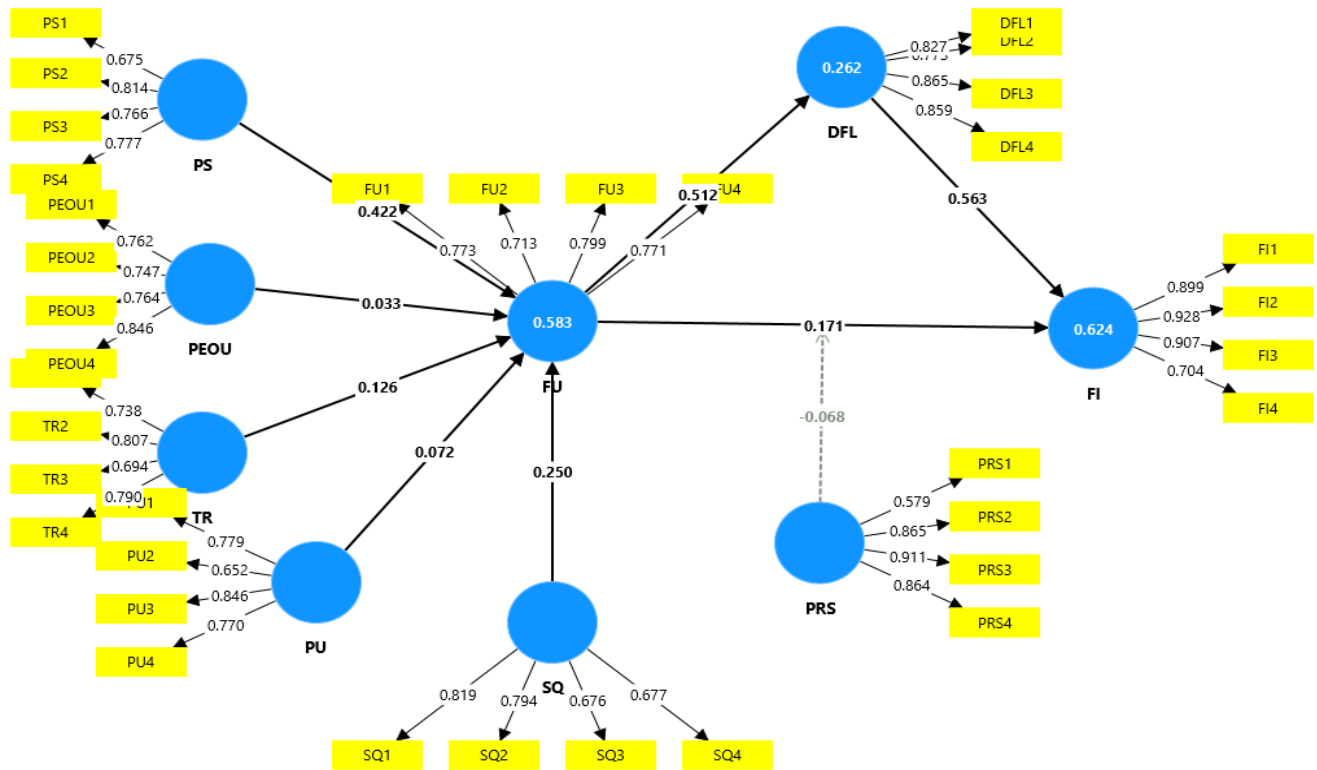


Figure 4: PLS-SEM Results and bootstrapping

#### 4.5. Measurement Model Assessment

The purpose of the measurement model assessment is to ensure the validity and reliability of our measurements. Content validity, reliability, discriminant validity, consistency reliability, and convergent validity of individual items are some of the components that make up the measurement model (Hair et al., 2020). By looking at their outer loadings, the individual constructs' reliability is assessed (Hair et al., 2020). To assess measurement models, it is crucial to distinguish between reflecting and formative models (Karnadi, 2023b).

Validity and reliability are evaluated using reflective measurement models. Composite reliability is frequently used to assess the internal consistency of a construct in terms of construct reliability. Composite reliability is better suitable for PLS-SEM, where indicators are ranked according to their reliability during model estimate, than Cronbach's alpha since it considers the fluctuating reliability of many indicators. Composite reliability values between 0.60 and 0.70 are deemed adequate in exploratory research, although values between 0.70 and 0.90 are recommended in later phases of the study (Hair et al., 2019b). Reliability is lacking if the outcome is less than 0.60.

The dependability of each indication should also be considered; standardized loadings greater than 0.70 are indicative of strong reliability. If deleting indicator values with loadings between 0.40 and 0.70 increases composite reliability above the recommended threshold, they may be taken off the scale. However, one should also consider how deleting indications may affect their validity. If weaker signs support content validity, they might be kept. Reflective scales should normally remove indicators with loadings of 0.40 or less.

Convergent and discriminant validity are crucial factors to consider when evaluating the validity of reflective measurement models. The average variance extracted (AVE) can be used to verify convergent validity. Sufficient convergent validity is indicated by an AVE value of 0.50 or above, which indicates that the dependent variable exhibits more than half of the variance in its indicators. Cross-loadings and the Fornell-Larcker criterion can be used to verify discriminant validity. A latent concept should exhibit greater variance with its assigned indicators than any other unobserved variables in the structural model, according to the Fornell-Larcker criterion. According to statistics, any latent variable's AVE values ought to exceed the squared correlation between it and any other construct. The indicator's factor loading with its associated latent concept must be higher than its loadings with all other constructs (i.e., the cross-loadings), according to the second requirement for discriminant validity.

#### **4.5.1. Internal consistency Reliability/ reliability**

As demonstrated, reflective measurement methods evaluate validity and reliability. Composite reliability is frequently used to assess the internal consistency of a construct in terms of construct reliability. Internal consistency dependability has traditionally been measured in social science research using "Cronbach's alpha." However, this measurement tends to be cautious when used with PLS-SEM. Prior research has suggested using "Composite Reliability" as a substitute metric to overcome this problem (Hair et al., 2020). According to (Karnadi, 2023b), A composite reliability reading of more than 0.7 is deemed satisfactory. Internal consistency across items is demonstrated by C.R. values greater than 0.7, which show that each construct evaluates distinct concepts. Likewise, the structures are impacted by Cronbach alpha values higher than 0.7. According to the values shown in Table 6 below, all reflective latent variables have Composite dependability scores that are greater than 0.7, indicating a high degree of internal consistency dependability.

#### 4.5.2. Convergent validity

Convergent validity is a validity category that evaluates the degree of relationship between various measures of the same construct. This indicates that there is a good correlation between all indicators that measure the same concept and that they assess mutual variables according to relevant theory. The Average Variance Extracted (AVE) for every latent variable is evaluated to determine convergent validity. Given that (Fornell & Larcker, 1981) specify that an appropriate value for AVE should be above 0.5, as demonstrated in Table 6 below, all the AVE values exceed the suggested cut-off point above 0.50, proving convergent validity or showing sufficient convergent validity (Hair et al., 2020). The C.R. coefficients also exceeded the recommended threshold of 0.70, indicating construct reliability (Hair et al., 2011). All the outer loading values in Table 6 fall between 0.655 and 0.884, demonstrating the dependability of the constructions or internal consistency. Convergent validity is evaluated using AVE and outer loading.

Composite reliability looks at the internal consistency of each factor, whereas Cronbach's alpha assesses the internal consistency of each construct. It shows how things relate to one another inside a single framework. A composite reliability scores greater than 0.7 is considered satisfactory, according to (Hair et al., 2020), Internal consistency across items is demonstrated by C.R. values greater than 0.7, which show that each construct evaluates distinct concepts. Likewise, the structures are impacted by Cronbach alpha values higher than 0.7.

*Table 6: Constructs Reliability and convergent Validity*

<b>Constructs</b>	<b>Indicators</b>	<b>Loadings</b>	<b>Cronbach's alpha</b>	<b>CR(rho_a)</b>	<b>AVE</b>
<b>Financial Inclusion</b>	FI1	0.899	0.882	0.883	<b>0.746</b>
	FI2	0.928			
	FI3	0.907			
	FI4	0.704			
<b>Fintech Use</b>	FU1	0.773	0.765	0.773	<b>0.584</b>
	FU2	0.713			
	FU3	0.799			
	FU4	0.771			
<b>Digital financial literacy</b>	DFL1	0.827	0.852	0.867	<b>0.691</b>
	DFL2	0.773			
	DFL3	0.865			
	DFL4	0.859			
<b>Perceived Regulatory Support</b>	PRS1	0.579	0.820	0.824	<b>0.665</b>
	PRS2	0.865			

	PRS3	0.911			
	PRS4	0.864			
<b>Trust (TR)</b>	TR1	0.738	0.752	0.752	<b>0.575</b>
	TR2	0.807			
	TR3	0.694			
	TR4	0.790			
<b>Perceived Usefulness (PU)</b>	PU1	0.779	0.768	0.819	<b>0.585</b>
	PU2	0.652			
	PU3	0.846			
	PU4	0.770			
<b>Perceived Ease of use (PEOU)</b>	PEOU1	0.762	0.789	0.800	<b>0.609</b>
	PEOU2	0.747			
	PEOU3	0.764			
	PEOU4	0.846			
<b>Perceived Security (PS)</b>	PS1	0.675	0.757	0.773	<b>0.576</b>
	PS2	0.814			
	PS3	0.766			
	PS4	0.777			
<b>Service Quality (SQ)</b>	SQ1	0.819	0.728	0.739	<b>0.553</b>
	SQ2	0.794			
	SQ3	0.676			
	SQ4	0.677			

### 4.5.3. Discriminant validity

A measure of how different notions differ from one another is called discriminant validity (Cable & DeRue, 2002). Cross-loading, the Heterotrait-Monotrait (HTMT) ratio, and the three criteria put out by (Fornell & Larcker, 1981; Leguina, 2015) were used in this work to evaluate discriminant validity.

#### 4.5.3.1. The Fornell-Larcker criterion of testing

According to (Fornell & Larcker, 1981), Finding each latent variable's Average Variance Extracted (AVE) square root is necessary to prove discriminant validity. Discriminant validity is demonstrated if the AVE values exceed the correlation values between the latent variables. Additionally, the Fornell-Larcker criterion calculates the difference between a construct's squared correlations with its indicators and other constructs. The construct is different from other constructions if there is a significant difference.

Each variable's square root of the AVE must be higher than the correlation between that construct and any other construct, according to the Fornell-Larcker criterion. Each factor's discriminant validity is demonstrated by the results in Table 7 (highlighted bold values), which compare a latent variable with the square root of AVE the variance of each variable. Crucially, each factor's square root of the AVE is higher than the correlation between the components, demonstrating how unique they are from other concepts. Discriminant validity has so been demonstrating (Hair et al., 2020).

For example, the square root of the latent variable FU, which has an AVE value of 0.584 (as indicated in Table 7), is 0.764. This value is higher than the correlation values for FI (0.864) in the row and FU (0.588,0.679,0.694,0.422,0.492, and 0.411) in the column. The same is true for the latent variables PRS and FI. These results demonstrate the successful establishment of discriminant validity.

*Table 7: Fornell-Larcker criterion for discriminant validity*

<b>Constructs</b>	<b>DFL</b>	<b>FI</b>	<b>FU</b>	<b>PEOU</b>	<b>PRS</b>	<b>PS</b>	<b>PU</b>	<b>SQ</b>	<b>TR</b>
Digital financial literacy	<b>0.832</b>								
Financial Inclusion	0.753	<b>0.864</b>							
Fintech Use	0.512	0.538	<b>0.764</b>						
Perceived Ease of use (PEOU)	0.444	0.528	0.492	<b>0.781</b>					
Perceived Regulatory Support	0.581	0.578	0.411	0.468	<b>0.816</b>				
Perceived Security (PS)	0.477	0.509	0.694	0.404	0.373	<b>0.760</b>			
Perceived Ease of use	0.390	0.517	0.422	0.636	0.461	0.336	<b>0.765</b>		
Service Quality (SQ)	0.495	0.541	0.679	0.619	0.415	0.671	0.492	<b>0.744</b>	
Trust (TR)	0.531	0.585	0.588	0.696	0.444	0.530	0.512	0.718	<b>0.759</b>

#### 4.5.3.2. Heterotrait-monotrait (HTMT) ratio matrix

The HTMT ratio matrix is used in PLS-SEM to assess a measurement model's discriminant validity. The HTMT ratio is calculated by dividing the squared correlation between two constructs by the product of their AVE values. The HTMT ratio values must be less than 0.90 to demonstrate discriminant validity. Since each HTMT is less than 0.90, as shown in Table 8, the discriminant validity requirements have also been met. This is another requirement for achieving discriminant validity between two constructs (Ahmed et al., 2023). Therefore, it is concluded that the dependent variable of the model, financial inclusion, supports the measurement model under consideration.

The HTMT ratio matrix can be calculated using the following formula:

$$HTMT = r_{ij}^2 / (AVE_i * AVE_j)$$

where the average variance extracted for construct i is denoted by  $[AVE]_i$ , the average variance extracted for construct j by  $[AVE]_j$ , and the squared correlation between constructions i & j by  $r_{ij}^2$ .

Table 8: Heterotrait-monotrait ratio (HTMT) – Matrix

Constructs	DFL	FI	FU	PEOU	PRS	PS	PU	SQ	TR
Digital financial literacy	0.854								
Financial Inclusion	0.613	0.638							
Fintech Use	0.525	0.628	0.605						
Perceived Ease of use (PEOU)	0.677	0.673	0.509	0.583					
Perceived Regulatory Support	0.579	0.615	0.886	0.514	0.454				
Perceived Security (PS)	0.461	0.614	0.506	0.810	0.588	0.439			
Perceived Ease of use	0.622	0.682	0.896	0.812	0.537	0.913	0.642		
Service Quality (SQ)	0.656	0.719	0.757	0.887	0.561	0.703	0.654	0.965	
Trust (TR)	0.027	0.116	0.098	0.065	0.073	0.160	0.106	0.104	0.072

### 4.5.3.3. Cross-loading

Each item loading (bolded) of the latent variables is bigger than the cross loading (with other scale items), as seen in Table 9 below.

Table 9: Cross-Loading

	DFL	FI	FU	PEOU	PRS	PS	PU	SQ	TR
<b>DFL1</b>	<b>0.827</b>	0.640	0.415	0.371	0.414	0.427	0.313	0.432	0.486
<b>DFL2</b>	<b>0.773</b>	0.471	0.314	0.249	0.335	0.347	0.258	0.311	0.343
<b>DFL3</b>	<b>0.865</b>	0.685	0.451	0.399	0.547	0.400	0.363	0.426	0.460
<b>DFL4</b>	<b>0.859</b>	0.672	0.493	0.426	0.594	0.406	0.346	0.456	0.458
<b>FI1</b>	0.570	<b>0.899</b>	0.500	0.503	0.482	0.414	0.455	0.484	0.507
<b>FI2</b>	0.617	<b>0.928</b>	0.501	0.494	0.550	0.464	0.479	0.492	0.523
<b>FI3</b>	0.628	<b>0.907</b>	0.462	0.460	0.543	0.445	0.463	0.445	0.490
<b>FI4</b>	0.770	<b>0.704</b>	0.386	0.360	0.409	0.424	0.380	0.441	0.492
<b>FU1</b>	0.438	0.458	<b>0.773</b>	0.351	0.380	0.645	0.297	0.556	0.455
<b>FU2</b>	0.297	0.264	<b>0.713</b>	0.281	0.244	0.466	0.192	0.431	0.285
<b>FU3</b>	0.386	0.380	<b>0.799</b>	0.355	0.291	0.517	0.343	0.555	0.519
<b>FU4</b>	0.420	0.500	<b>0.771</b>	0.490	0.324	0.482	0.424	0.516	0.500
<b>PEOU1</b>	0.342	0.398	0.347	<b>0.762</b>	0.385	0.313	0.540	0.480	0.479
<b>PEOU2</b>	0.322	0.384	0.296	<b>0.747</b>	0.409	0.260	0.491	0.429	0.448
<b>PEOU3</b>	0.353	0.442	0.457	<b>0.764</b>	0.333	0.349	0.497	0.492	0.598
<b>PEOU4</b>	0.363	0.415	0.398	<b>0.846</b>	0.356	0.323	0.466	0.519	0.609
<b>PRS1</b>	0.679	0.459	0.331	0.208	<b>0.579</b>	0.322	0.246	0.321	0.282
<b>PRS2</b>	0.357	0.400	0.288	0.360	<b>0.865</b>	0.247	0.343	0.263	0.320
<b>PRS3</b>	0.414	0.464	0.372	0.456	<b>0.911</b>	0.315	0.430	0.374	0.407
<b>PRS4</b>	0.415	0.522	0.329	0.469	<b>0.864</b>	0.311	0.450	0.366	0.408
<b>PS1</b>	0.254	0.296	0.398	0.268	0.133	<b>0.675</b>	0.216	0.488	0.366
<b>PS2</b>	0.437	0.499	0.545	0.397	0.338	<b>0.814</b>	0.298	0.603	0.513
<b>PS3</b>									

	0.336	0.361	0.496	0.271	0.302	<b>0.766</b>	0.245	0.486	0.380
<b>PS4</b>	0.393	0.374	0.628	0.289	0.323	<b>0.777</b>	0.258	0.471	0.355
<b>PU1</b>	0.405	0.485	0.277	0.490	0.386	0.295	<b>0.779</b>	0.378	0.403
<b>PU2</b>	0.150	0.245	0.207	0.397	0.408	0.201	<b>0.652</b>	0.248	0.225
<b>PU3</b>	0.328	0.436	0.430	0.533	0.383	0.246	<b>0.846</b>	0.429	0.439
<b>PU4</b>	0.281	0.387	0.316	0.514	0.269	0.295	<b>0.770</b>	0.413	0.455
<b>SQ1</b>	0.380	0.365	0.574	0.471	0.281	0.485	0.383	<b>0.819</b>	0.630
<b>SQ2</b>	0.413	0.425	0.498	0.569	0.336	0.425	0.438	<b>0.794</b>	0.658
<b>SQ3</b>	0.358	0.424	0.431	0.465	0.323	0.528	0.354	<b>0.676</b>	0.467
<b>SQ4</b>	0.326	0.410	0.503	0.342	0.306	0.570	0.291	<b>0.677</b>	0.365
<b>TR1</b>	0.442	0.486	0.435	0.638	0.352	0.356	0.489	0.511	<b>0.738</b>
<b>TR2</b>	0.390	0.437	0.443	0.658	0.387	0.403	0.500	0.592	<b>0.807</b>
<b>TR3</b>	0.341	0.406	0.454	0.368	0.264	0.373	0.224	0.468	<b>0.694</b>
<b>TR4</b>	0.436	0.446	0.449	0.450	0.343	0.471	0.345	0.602	<b>0.790</b>

#### 4.6. Structural model Analysis

The importance of the path coefficients and the R<sup>2</sup> measurements are the primary determinants used to evaluate the structural model. Having a high R<sup>2</sup> for the key target constructs is crucial in prediction-oriented PLS-SEM since the objective is to explain the variance of the endogenous latent variables. High R<sup>2</sup> might, however, differ based on the field of study. For instance, an R<sup>2</sup> value of 0.20 is seen as high in consumer behaviour research, whereas an R<sup>2</sup> value of 0.75 is regarded as strong in success driver studies. For dependent latent variables in the structural model, R<sup>2</sup> values of 0.75, 0.50, or 0.25 can be analysed as significant, moderate, or weak, respectively, in marketing research investigations.

The standardized beta coefficients of ordinary least squares regressions can be used to understand the path coefficients that were derived from the path model analysis in the PLS structural model. The significance of each path coefficient can be ascertained by a bootstrapping procedure, much like with the loadings and weights of the indicators. A previous hypothesis is

not supported by paths that are nonsignificant or exhibit indications that deviate from the predicted direction. On the other hand, the suggested causal relationship is empirically supported by significant routes that indicate the hypothesized direction.

The initial hypothesis is not supported by paths that deviate from (are not significant) the hypothesized direction. On the other hand, significant pathways that go in the same direction provide empirical evidence for the suggested causal relationship. The structural model's prediction capacity is another evaluation outcome. Predictive significance is frequently checked using the Stone-Geisser's Q2 metric. The model must correctly predict the indicators of each endogenous latent component. By blindfolding certain data points and using the estimates to guess the omitted portion, the Q2 value is determined. It's important to select the right omission distance, which is usually between 5 and 10.

#### **4.6.1. Hypothesized direct relationship.**

The whole structural model is shown on Figure 5, which also shows how the independent, dependent, mediating, and moderating factors interact. We looked at the T-values and P-values to test the variable hypotheses.  $T > \pm 1.96$  and  $P < 0.05$  are the cutoff points. The association between the two variables were supported and significant if the variables' results satisfy these requirements. Based on the link between independent components, the hypothesis' outcomes are shown in Table 10.

To ascertain the path for the coefficient level and its relevance for the proposed hypothesis, this study used the PLS algorithm and bootstrapping with 5000 resamples. As indicated in Table 10 below, the hypotheses were accepted and rejected based on the path coefficient, p-value, and t-statistics values. Path coefficient values can be used to analyse how strongly the variables are related to one another. Strong relationships are indicated by path coefficient values close to +1, and vice versa (Hair et al., 2020). The acceptance and rejection of the suggested hypotheses are indicated by p-Values and t-statistics. Furthermore, a low or zero standard deviation indicates that the respondent uses the same response or response pattern for all or most of the the survey's questions.

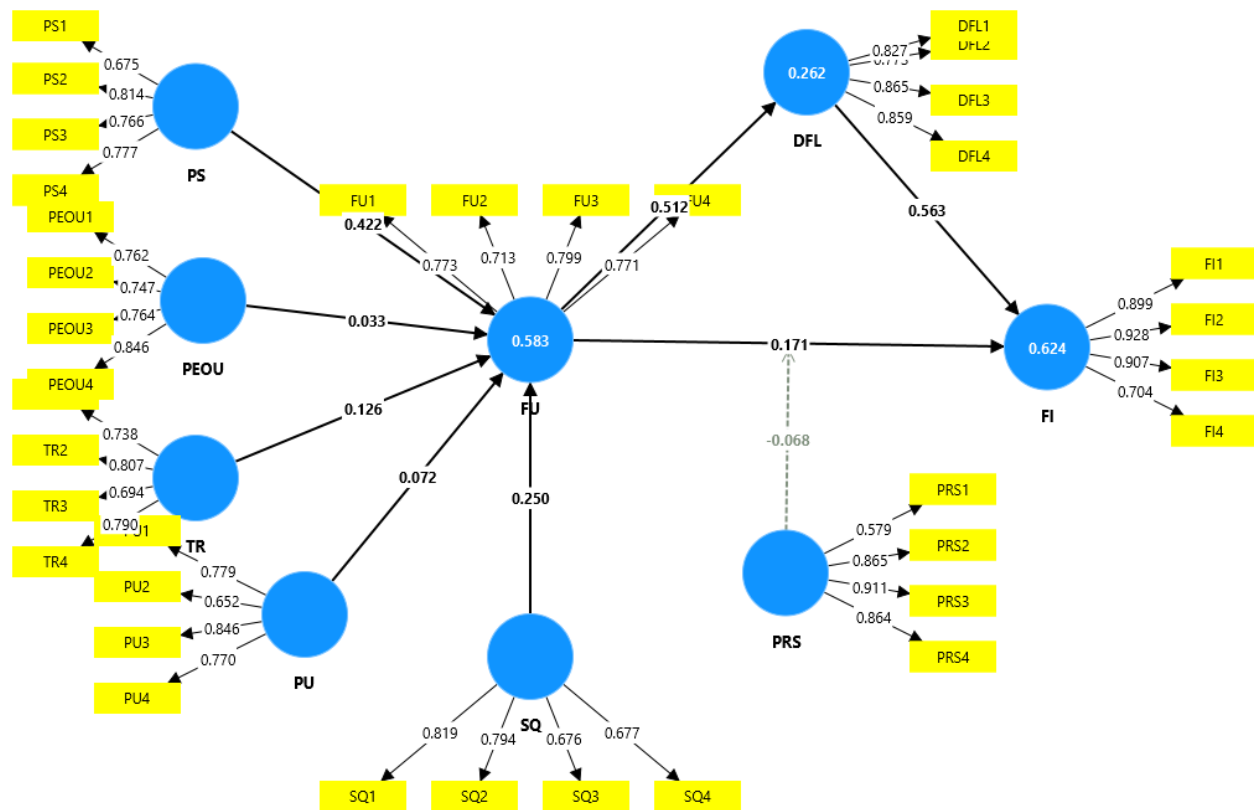


Figure 5: Structural research model assessment

Table 10 following provides a summary of the hypothesis' findings from this investigation. SMEs' Financial Inclusiveness is greatly impacted by Fintech use, as demonstrated below ( $\beta = 0.171$ ,  $p < 0.001$ ,  $t = 11.354$ ). Fintech use has a positive and significant impact on digital financial literacy ( $\beta = 0.512$ ,  $p < 0.000$ ,  $t = 12.878$ ), trust has a significant and positive effect on Fintech use ( $\beta = 0.126$ ,  $p < 0.000$ ,  $t = 2.162$ ), service quality has a positive and significant effect on Fintech use ( $\beta = 0.250$ ,  $p < 0.000$ ,  $t = 3.738$ ), and perceived security has a positive and significant effect on Fintech use ( $\beta = 0.422$ ,  $p < 0.000$ ,  $t = 7.423$ ). Lastly, it was acknowledged that financial inclusion is positively and significantly impacted by digital financial literacy ( $\beta = 0.553$ ,  $p < 0.000$ ,  $t = 12.878$ ).

Table 10: Hypothesised Direct relationship.

Hypothesis	Path Coeff( $\beta$ )	Mean (M)	Standard deviation	T-Values	P- values	95% CI	Decision
PU -> FU	0.072	0.073	0.049	1.438	0.151	0.1613	Rejected.
PEOU -> FU	0.033	0.033	0.062	0.532	0.595	0.1504	Rejected
TR -> FU							Accepted

	0.126	0.059	0.026	2.162	0.031	0.2316	
<b>SQ -&gt; FU</b>							Accepted
	0.250	0.249	0.067	3.738	0.000	0.3862	
<b>PS -&gt; FU</b>							Accepted
	0.422	0.425	0.057	7.423	0.000	0.5372	
<b>FU -&gt; FI</b>							Accepted
	0.171	0.462	0.041	11.354	0.000	0.2508	
<b>FU -&gt; DFL</b>							Accepted
	0.512	0.574	0.045	12.878	0.000	0.5887	
<b>DFL -&gt; FI</b>							Accepted
	0.563	0.574	0.045	12.878	0.000	0.6589	

#### 4.6.2. Checking Structural Path Significance in Bootstrapping

By bootstrapping, SmartPLS can generate T-statistics for importance testing the internal and external shows. To generate bootstrap standard errors and assumed T-values for the structural path's significance testing, many subsamples (for example, 5000) are taken from the original test with replacement. The data normalcy is essentially represented by the Bootstrap result. In SmartPLS, the number of bootstrap subsamples is referred to as the study's samples, and the test sample size of the given research is called Cases under the Bootstrapping option.

The number of "Cases" (not "Samples") in the setting should be increased to 350 since the study data set contains 350 significant observations. The remaining parameters remain unchanged: There are no changes to the sign, 350 cases and 5000 tests. Importantly, if the bootstrapping result using the "No Sign Changes" option turns out to be negligible, you should rerun the process using the center "Construct Level Changes" option and use that result instep. However, if the inverse result is obtained using the "Individual Sign Changes" option, you should use that result instep. This is often because it is acknowledged that this choice strikes a very good compromise between the two outstanding sign modify settings. Once the process is complete, navigate to the "Path Coefficients (Mean, SD, T-Statistics)" part of the bootstrapping results.

Examine the values in the "T-Statistics" column to determine if the inner model's path coefficients are statistically significant at the 5% significance level using the two-tailed t-test. If the T-statistic is greater than 1.96, the route coefficient is significant. The "PU-FU" connection (1.438) and the "PEOU-FU" linkage (0.532) are not significant, according to the study illustration. This illustrates earlier findings when examining the PLS-SEM, which is derived externally (Table 10). According to Table 10, every other path coefficient in the inner model satisfies the requirements for statistical significance.

#### 4.6.3. Regression analysis or R-squared value ( $R^2$ )

To evaluate the change in the model, we incorporated the mediating and moderating variables to ascertain the relationship between the independent and dependent variables (see Table 11 below). For instance, 0.624 (Financial Inclusion), 0.583 (Fintech Use), and 0.262 (Digital Financial Literacy) exerted the change on their respective dependent variables. The results in Table 11 demonstrated that the R-squared values are within the threshold cut-off point.

*Table 11: Regression analysis or R-squared values*

<b>Factors</b>	<b>R-square</b>	<b>R-square adjusted</b>
<b>Financial Inclusion</b>	0.624	0.620
<b>Fintech Use</b>	0.583	0.577
<b>Digital Financial literacy</b>	0.262	0.260

#### 4.6.4. F-squared analysis

When the exogenous variable is eliminated from the model, the f-squared value of digital financial literacy with SMEs Financial inclusion is 0.480, as shown in Table 12. This is a medium shift. The value between FU and FI is 0.055, which is regarded as large, if  $f \geq 0.02$  is little,  $f \geq 0.15$  is medium, and  $f \geq 0.35$  is large, according to (Cohen, 1988). TR-FU, SQ-FU, and PU-FU have large f-squared analyses of 0.014, 0.051, and 0.007, respectively.

*Table 12: Regression analysis or F-squared values*

	<b>DFL</b>	<b>FI</b>	<b>FU</b>
DFL		0.480	
FI			
FU	0.354	0.055	
PEOU			0.001
PRS		0.053	
PS			0.231
PU			0.007
SQ			0.051
TR			0.014
PRS x FU		0.013	

#### 4.6.5. Multicollinearity analysis (VIF)

When discussing results in comparison to the outer model, the inner model's VIFs are usually utilized. The inner model illustrates the connections between the relevant theoretical notions and the latent variables. The links between the latent variables and the observable variables which are the latent variables' measures are displayed by the outer model. As a result, the inner model's VIFs are more pertinent to understanding the outcomes. To determine whether any exogenous latent variables in the inner model should be removed, combined into a single variable, or have a

higher-order latent variable created, each set of exogenous latent variables is examined for possible collinearity issues.

Table 13 findings demonstrate that the VIF values are less than 5. This demonstrates that multicollinearity is not an issue (Ahmed et al., 2023). Between FU and FI, the VIF values are 1.0 and 0, respectively. Similarly, the remaining VIF values among the factors are likewise less than five. In conclusion, multicollinearity is not an issue.

**Table 13: Multicollinearity Statistics (VIF)**

	<b>DFL</b>	<b>FI</b>	<b>FU</b>
DFL		1.754	
FI			
FU	1.000	1.403	
PEOU			2.523
PRS		1.556	
PS			1.844
PU			1.731
SQ			2.915
TR			2.658

#### 4.6.6. Mediation Analysis Results

Examining how a third variable influences or intervenes in the relationship between two other variables is known as mediation (Hayes, 2009). An intervening model, for instance, hypothesizes that a variable X influences an outcome variable Y through one or more intervening variables, also referred to as mediators (Hayes, 2009). A variety of direct and indirect forces may contribute to X's overall impact on Y. In this study, we concentrate on the indirect force.

Indirect effects occur when two constructs travel via one or more other constructs, whereas direct effects occur when two creations are connected by a single line. Table 14 below shows the constructs' direct effect as assessed by the p-values, T-statistics, SD, mean, and path coefficient (o).

*Table 14: Path coefficients (Mean, STDEV, T values, p values) -Direct effect*

<b>Constructs</b>	<b>Original sample (O)</b>	<b>Sample mean (M)</b>	<b>Standard deviation (STDEV)</b>	<b>T statistics ( O/STDEV )</b>	<b>P values</b>
<b>DFL -&gt; FI</b>	0.575	0.574	0.045	12.878	0.000

<b>FU -&gt; DFL</b>	0.512	0.514	0.042	12.109	0.000
<b>FU -&gt; FI</b>	0.461	0.462	0.041	11.354	0.000
<b>PEOU -&gt; FU</b>	0.033	0.033	0.062	0.532	0.595
<b>TR -&gt; FU</b>	0.124	0.128	0.056	2.228	0.026
<b>SQ -&gt; FU</b>	0.250	0.249	0.067	3.738	0.000
<b>PS -&gt; FU</b>	0.425	0.425	0.057	7.423	0.000
<b>PU -&gt; FU</b>	0.070	0.073	0.049	1.438	0.151

#### 4.6.6.1. How to test the mediating effect using indirect effect

The new methodology for testing mediation presented by (Kock, 2014), which builds on (Hayes, 2009), is more effective and less prone to errors than the conventional method of evaluating mediation offered by (Baron & Kenny, 1986), which does not rely on standard errors. The mediating effect analysis was computed in this study. The mediating analysis comprises constructing the indirect theoretical link between the dependent and independent factors, including the mediating variables, in order to determine the degree to which indirect impacts via the mediating variables change the hypothesis direct path. The study's hypothesis was that the association between Fintech use and SMEs' financial inclusion would be mediated by the variable of digital financial literacy. The objective is to reveal significant and relevant indirect impact relationships in addition to verifying the significant path coefficient ( $\beta$ ), which in this case is the original mean (o) in table 15.

*Table 15: Mediation analysis through Indirect effect*

<b>Constructs</b>	<b>Original sample (O)</b>	<b>Sample mean (M)</b>	<b>Standard deviation (STDEV)</b>	<b>T statistics ( O/STDEV )</b>	<b>P values</b>	<b>Mediation</b>
<b>FU -&gt; DFL -&gt; FI</b>	0.294	0.295	0.033	8.845	0.000	Supported

PLS-SEM was used to assess the mediating effects of DFL on the link between FU and the financial inclusion of SMEs. Hypothesis H9 was supported since the data demonstrated that DFL significantly and favorably mediates the effect of FU and FI ( $\beta = 0.294$ ,  $t = 8.845$ ,  $p < 0.000$ ). This can be read as the existence of mediation, and the path coefficient of 0.294 explains how the use of fintech affects SMEs' financial inclusion. This suggests that the use of Fintech has an indirect effect on the financial inclusion of SMEs through the mediation of digital financial

literacy, with a p-value of 0.000, a t-statistic of 8.845, and a coefficient value of 0.294. As a result, we might say that the hypothesis has validity.

#### 4.6.7. Moderation Analysis Results

According to (Dawson, 2014) A phrase in the context of management research, a moderator is any variable that influences the relationship between two or more other factors; the moderator's impact on this relationship is known as moderation. The most basic type of moderation in statistics is when the value of a moderator variable, Z, affects the connection between an independent variable, X, and a dependent variable, Y. The regression equation of Y on X would provide a simple test of a linear relationship between X and Y.

The association between Fintech use and SMEs' financial inclusion was thought to be moderated by the variable perceived regulatory support in this study. The objective is to reveal significant and relevant indirect impact relationships in addition to verifying the significant route coefficient ( $\beta$ ), which in this case is the original mean (o) in Table 16.

Table 16: Moderation effect Analysis Results

Constructs	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ( O/STDEV )	F square	P values	Moderation
PRS x FU -> FI	-0.066	-0.066	0.033	1.997	0.013	0.046	Supported

0.066 is the beta coefficient ( $\beta$ ). This demonstrates the degree and direction to which the relationship between financial inclusion and FinTech use is moderated by perceived regulatory support. A negative beta value indicates a slight waning of the positive correlation between financial technology use and financial inclusion as perceived regulatory support rises. To put it another way, increased regulatory backing might not always improve FinTech's influence on financial inclusion in our setting. The moderating effect's significance is assessed using the t-value. A result is considered statistically significant if the t-value is larger than 1.96 (at a 95%

confidence level). Additionally, the moderating impact is statistically significant but rather modest, as indicated by the t value of 1.997, which is just above the threshold.

The moderating impact is statistically significant, as indicated by the p-value being less than 0.05. This indicates that the relationship between FinTech adoption and financial inclusion is moderated by perceived regulatory support. The moderating effect's practical significance is gauged by the effect size ( $f^2$ ). Although the moderating effect is statistically significant, its practical impact on the relationship between FinTech use and financial inclusion is minor, as seen by the modest value of 0.013.

According to the negative beta coefficient, FinTech use and financial inclusion SMES in Addis Ababa are not positively correlated with perceived regulatory support. This may suggest that Addis Ababa's SMEs do not believe that regulatory assistance effectively promotes financial inclusion or FinTech adoption. Although statistically significant, the small effect size ( $f^2 = 0.013$ ) suggests that perceived regulatory support has little practical impact on the connection. This could imply that the influence of FinTech on financial inclusion may be more significantly shaped by other elements (such as infrastructural or cultural constraints).

## 4.2. Discussion

This study examined the mediating and moderating impacts of digital financial literacy and perceived regulatory support in the relationship between FinTech use and financial inclusion, acknowledging their significance in FinTech-enabled financial inclusion. A gap in the literature that has not examined the moderating impact of perceived regulatory support, and the mediating effect of digital financial literacy served as the impetus for this study. particularly in relation to SMEs in Ethiopia, which have not received enough attention in earlier studies. Additionally, by using the suggested model, the work advances theoretical progress.

Initially According to the study's findings, trust had a major and favorable impact on FinTech service usage (**Hypothesis 3**). With all other variables held equal, the coefficient ( $\beta$ ) of 0.126 shows that the use of fintech rises by 0.126 units for every unit increase in trust. According to the t-value of 2.162, there is a statistically significant correlation between trust and fintech use. This indicates strong empirical support for the hypothesis, which is consistent with earlier studies by (Alrawad et al., 2023; Amnas et al., 2023; Savitha et al., 2022) and suggests that the observed results are not likely to be the result of chance, this validation demonstrated the crucial role that

trust plays in encouraging the use of FinTech platforms. When consumers believe that a FinTech platform is dedicated to safeguarding their financial data, they are more likely to embrace and use it.

Second, the findings also showed that service quality has a favorable and noteworthy impact on the adoption of FinTech services. **(Hypothesis 4)**. The coefficient ( $\beta$ ) of 0.422 means that, while all other parameters are held constant, the use of fintech rises by 0.422 units for every unit increase in the use of fintech's. The statistical significance of the association between service quality and fintech use is indicated by the t-value of 3.738. This indicates strong empirical support for the hypothesis in line with another research by (Gautam & Sah, 2023b; George & Sunny, 2023b). and indicates that the observed outcomes are unlikely to occur by chance. Put in another manner, FinTech platforms may draw consumers in and encourage consistent use of their services by the quality of their goods, which include user-friendly designs, a wide range of features, speed, customization possibilities, prompt customer support, and clear communication.

Third, the study's findings supported the hypothesis that using FinTech is positively correlated with perceived security **(Hypothesis 5)**. The utilization of FinTech services was strongly and favorably impacted by perceived security. With all other variables held equal, the coefficient ( $\beta$ ) of 0.126 shows that the use of fintech rises by 0.126 units for every unit increase in use of fintech. According to the t-value of 7.423, The usage of fintech and perceived security are statistically correlated. This indicates strong empirical support for the hypothesis, which is in line with previous research and other studies from the literature by (Bajunaied et al., 2023b; Lim et al., 2019; Nasir et al., 2023) It follows that the observed results are unlikely to be the result of chance. research demonstrates that people are more likely to use FinTech platforms when they feel secure about their sensitive information. To put it another way, the sense of security reduces the dangers associated with online transactions, increases confidence, and eases concerns about privacy.

The fourth major finding of this study is that FinTech use has a positive and considerable impact on financial inclusion **(Hypothesis 6)**. The results of the study show that the financial inclusion of SMEs is significantly and favorably impacted by the usage of financial technologies. The coefficient ( $\beta$ ) of 0.171 indicates that for every unit increase in fintech usage, SMEs' financial inclusion increases by 0.171 units when all other parameters remain constant. According to the t-

value of 11.354, there is a statistically significant correlation between SMEs' financial inclusion and their usage of fintech. This indicates strong empirical support for the theory, which supports the earlier research by (Asif et al., 2023b; Buckley et al., 2019; Yang & Zhang, 2022). It means getting into FinTech can increase access to financial services through digital channels.

Fifth, this research revealed that using FinTech services improved digital financial literacy as well (Hypothesis 7). According to the study's findings, SMEs' digital financial literacy is greatly and favorably impacted using financial technologies. With all other factors held equal, the coefficient ( $\beta$ ) of 0.512 shows that SMEs' degree of digital financial literacy rises by 0.512 units for every unit increase in the use of fintech. The t-value of 12.878 indicates that there is a statistically significant correlation between SMEs' degree of digital financial literacy and their adoption of fintech. This indicates strong empirical support for the theory, which is in line with earlier research by (Amnas et al., 2024b), stated that FinTech is facilitating learning about finances with educational resources, hands-on learning experiences, and real-time monitoring. And indicates that the observed outcomes are unlikely to have happened by accident

Sixth, this study discovered that SMEs' financial inclusion is significantly impacted by digital financial literacy (**Hypothesis 8**). When all other parameters are held constant, the coefficient ( $\beta$ ) of 0.563 shows that the financial inclusivity of SMEs increases by 0.563 units for every unit increase in the level of digital financial literacy. According to the t-value of 12.878, there is a statistically significant correlation between SMEs' financial inclusivity and their degree of digital financial literacy. This indicates strong empirical support for the theory, which is consistent with earlier research and another study by (Ravikumar et al., 2022b; Savitha et al., 2022). This suggests that consumers with higher levels of digital financial literacy are better equipped to make informed financial decisions, lower the risk associated with FinTech services, and actively participate in the formal financial system. Additionally, this study demonstrates that digital financial literacy acts as a mediator in the relationship between FinTech use and financial inclusion (**Hypothesis 9**). Therefore, by using the educational tools offered by FinTech platforms, users are likely to increase their digital financial literacy, which contributes to better financial inclusion.

The findings show that, according to the t-values and p-values acquired, the relationships between PEOU and FU and PU and FU are not statistically significant. This suggests that the

relationship between Fintech use and these links is not much impacted directly. We may conclude that perceived usefulness and ease of use are not substantially correlated with the usage of fintech in this study because the p-value is higher than the significance level of 0.05. Although it is not statistically significant, the beta coefficient values show a weak positive association between the two variables. Linkage between PEOU and FU ( $t=0.033$ ,  $p\text{-value} = 0.595$ ) and PU and FU ( $t=0.072$ ,  $p\text{-value} = 0.151$ ). The study discovered no significant correlation between operational capabilities and financial technology use, indicating that the hypothesis that operational capabilities and SMEs' use of financial technologies are not statistically significant was not substantiated. This could be due to Fintech Use might be driven more by other factors such as trust, service quality, regulatory environment, or financial literacy rather than perceived usefulness or ease of use and both Perceived usefulness and ease of use might influence initial awareness but not sustained usage, depending on the stage of fintech adoption.

Regarding the final hypothesis (**Hypothesis 10**), We accept the hypothesis since the data demonstrate that perceived regulatory support does have a statistically significant moderating effect ( $p < 0.05$ ). The moderating impact may, however, operate in the opposite way than anticipated, as indicated by the negative beta value. This result runs counter to some research that suggests regulatory backing increases FinTech's influence on financial inclusion. Potential explanations include the belief that regulatory assistance is inadequate or ineffectual in removing obstacles to the widespread use of FinTech in Addis Ababa (e.g., lack of clear policies, bureaucratic bottlenecks, or weak enforcement). SMEs may be underserved by regulatory support that is more geared toward large corporations or conventional banking institutions. The legislative framework and the real requirements of SMEs in implementing FinTech solutions may not align.

## **CHAPTER FIVE**

### **5. CONCLUSION, IMPLICATIONS AND RECOMMENDATION**

#### **5.1. Conclusion and Practical Implication**

One of the most important global concerns for economies and the attainment of equitable growth in both developed and developing nations is financial inclusion. Additionally, previous studies have shown that emerging and developing economies continue to face numerous obstacles in their pursuit of financial inclusion. Furthermore, the SME sector suffers the most since emerging nations ignore the financial exclusion of SMEs. The financial sector now has a chance to reach the sizable but dispersed target market of SMEs owing to the digitization of financial services. Banks may now more easily and affordably reach and serve their target market because to the digitalization of financial services. Additionally, SMEs can use digital financial services to improve their outreach and performance at a cheap cost.

Fintech finance significantly contributes to the growth of SMEs. Financial technology makes it possible for SMEs to obtain all the information they need to complete all aspects of their

business. Furthermore, the ability of SMEs to swiftly and effectively adjust to ever-more-advanced technical advancements is evidence that all transaction operations can be established in a timely and secure manner. Financial Technology Financial inclusion is significantly improved by fintech. Because financial inclusion has given people access to a safe regulator and information about potential dangers, consumers of technology-based financial technology services in interactions with other financial technology users demonstrate that confidence has been gained.

This study provides valuable insights into the intricate relationship between financial inclusion and FinTech use. According to the study, three important elements that influence users' decision to continue using FinTech services are perceived security, service quality, and trust. The results show that by making financial services more accessible and reducing transaction costs, FinTech encourages financial inclusion. Making the most of FinTech services requires an understanding of digital money, according to this survey. To put it another way, being digitally literate is essential for participating in the official financial system and making wise financial decisions in this era of insane technological breakthroughs.

For financial institutions, legislators, and FinTech service providers, this research has several implications. FinTech businesses must first ensure that users trust them. This means that having excellent customer service, putting in place more security, and communicating clearly will all contribute to building confidence with clients. Second, investing in improving their services' usability, speed, and dependability is a wise way to raise service quality, which is crucial for keeping users. Security is important now. Users' concerns can be reduced by providing them with regular security information updates and education on how their data is protected. It all comes down to gaining confidence.

Third, educational institutions and policymakers should collaborate to take action to raise people's level of digital financial literacy. By providing lessons and educational information on their platforms in creative and engaging ways, fintech companies may help improve literacy. It might be revolutionary to implement special programs to increase digital financial literacy, particularly for small and medium enterprises. Finally, authorities and FinTech companies should continue to monitor the development of FinTech platforms. Frequent evaluations of user

experiences, security protocols, and the effectiveness of digital literacy initiatives will sustain FinTech's positive influence on financial inclusion.

## **5.2. Limitations and Future Scope of this Study**

This study has limitations even if it provides useful information. Since there was no predetermined list of SMEs using FinTech in their daily operations, this study used a convenience sample method. Although it may not be representative of all FinTech users in SMEs, this pragmatic approach may induce bias. Additionally, since this study concentrated on FinTech users in Addis Ababa' manufacturing SMEs, the results may not be applicable in other regions due to variations in economic conditions, legal frameworks, and FinTech environments. Additionally, this study did not examine the impact of other external factors on FinTech adoption and financial inclusion, such as Internet infrastructure and existing legislation and regulations. It is more probable that FinTech use, and financial inclusion may be significantly impacted by age, experience, and attitude toward technology use.

Future research could concentrate on qualitative studies and move beyond quantitative research to expand our understanding in this field. First, by include additional SMEs' service sectors, future research can broaden and evaluate the subject. Second, it could be intriguing to include more variables that directly affect SMEs' financial inclusion and fintech use. Third, future research can concentrate on FinTech services such as robo-advisors, peer-to-peer lending, or mobile payments. It is worthwhile to investigate each one as they may have varying effects on financial inclusion. Fourth, the results of this study may be more broadly applicable if large samples are employed.

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Appendix A. Supplementary material

**SURVEY QUESTIONNAIRE**

*The Effect of Financial Technologies (Fintech) on Financial Inclusion of SMEs: Exploring the Mediating role Digital Financial Literacy and Moderating Effect of Perceived Regulatory Support.*

Dear Sir / Madam,

Thank you for being so cooperative in participating in completing this survey. We are working on research titled “The Effect of Financial Technologies (Fintech) on Financial Inclusion of SMEs: Exploring the Mediating role Digital Financial Literacy and Moderating Effect of Perceived Regulatory Support”. The main target of this survey is to identify The Effect of Financial Technologies (Fintech) on Financial Inclusion of SMEs. This questionnaire is purely for research purposes, and your personal information will be kept private.

### SECTION A: GENERAL INFORMATION

This section is intended to obtain general information about you and your firm. Please put (√) to select the right choices.

<p>1. Gender</p> <p><input type="checkbox"/> Male</p> <p><input type="checkbox"/> Female</p> <p>2. You Position in organization</p> <p><input type="checkbox"/> General Manager</p> <p><input type="checkbox"/> Head of Department</p> <p><input type="checkbox"/> Operational employees</p> <p><input type="checkbox"/> Other</p> <p>5. Level of education</p> <p><input type="checkbox"/> Bachelor</p> <p><input type="checkbox"/> Masters</p> <p><input type="checkbox"/> PhD</p> <p><input type="checkbox"/> Others</p> <p>7. Firm Age</p> <p><input type="checkbox"/> No more than five years</p> <p><input type="checkbox"/> 6-9 years</p> <p><input type="checkbox"/> 10-20 years</p> <p><input type="checkbox"/> More than 20 years</p>	<p>3. Year of Experience</p> <p><input type="checkbox"/> &lt;5 ears</p> <p><input type="checkbox"/> 6-10 years</p> <p><input type="checkbox"/> 11-15 years</p> <p><input type="checkbox"/> &gt;15 years</p> <p>4. Age</p> <p><input type="checkbox"/> 20-30 years</p> <p><input type="checkbox"/> 31-40 years</p> <p><input type="checkbox"/> 41-50 years</p> <p><input type="checkbox"/> 51 and above</p> <p>7. Firm size</p> <p><input type="checkbox"/> 1-4 employees</p> <p><input type="checkbox"/> 5-19 employees</p> <p><input type="checkbox"/> 20-99 employees</p> <p><input type="checkbox"/> More than 100 employees</p>	<p>6. Industry /product</p> <p><input type="checkbox"/> Textile and apparel</p> <p><input type="checkbox"/> Food Processing and beverage</p> <p><input type="checkbox"/> Leather goods</p> <p><input type="checkbox"/> Chemical &amp; related materials</p> <p><input type="checkbox"/> Pharmaceutical and medical</p> <p><input type="checkbox"/> Rubber and plastics</p> <p><input type="checkbox"/> Non-metallic mineral products</p> <p><input type="checkbox"/> Metal and engineering</p> <p><input type="checkbox"/> Electrical machinery and equipment</p> <p><input type="checkbox"/> Others</p>
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Constructs	Statement	1	2	3	4	5	6	7
<b>Perceived Usefulness (PU)</b>	I think using FinTech service can make understanding more efficient							
	I think using the FinTech service will not be limited by time and location restrictions, which really helped me							
	I think using the FinTech service can make life more comfortable							
	FinTech service helps me learn to operate Smartphone							
<b>Perceived Ease of use</b>	Downloading the FinTech service application program from the internet is easy							

<b>(PEOU)</b>	Completing the transaction using FinTech service is easy								
	Using the FinTech service without reading the guide is easy								
	Transact using FinTech services more effectively than using cash								
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	
<b>Trust (TR)</b>	I believe the transaction system for FinTech services is safe								
	I trust that FinTech platforms will securely handle and protect my financial information.								
	I believe creating an account and password for balance access at FinTech that is available makes security increase								
	I trust that FinTech platforms adhere to ethical standards and guidelines in their business practices								
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	
<b>Service Quality (SQ)</b>	FinTech services consistently meet my expectations in terms of reliability and performance								
	I am satisfied with the speed and efficiency of problem resolution when I encounter issues with FinTech services								
	The user interface of FinTech apps is intuitive and easy to navigate.								
	FinTech platforms provide clear and transparent information about fees, charges, and terms of use.								
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	
<b>Perceived Security (PS)</b>	I believe that my personal and financial information is secure when using FinTech platforms.								
	I am confident that FinTech platforms promptly address and resolve any security vulnerabilities.								
	I have confidence in the effectiveness of the authentication methods employed by FinTech services to prevent unauthorized access.								
	I believe that FinTech companies implement sufficient measures to safeguard against fraud and cyber threats.								
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	
<b>Fintech Use (FU)</b>	I frequently employ FinTech for making payments and transferring funds								
	I turn to FinTech services when I require financial assistance								
	I leverage FinTech investment platforms to oversee my investment portfolio.								
	I actively engage with FinTech insurance services to purchase and oversee insurance policies.								
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	
<b>Financial inclusion</b>	FinTech services have expanded my access to financial products and services.								
	FinTech services have increased my ability to save and invest my money.								
	FinTech adoption has made it easier for me to send and receive money.								
	FinTech services have improved my ability to access credit and loans.								
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	
<b>Digital financial literacy (DFL)</b>	I am knowledgeable about the various features and functionalities of fintech apps.								
	I am aware of the potential risks and security measures associated with using digital payment systems								
	I know how to troubleshoot common issues related to digital financial transactions.								
	I am familiar with the terms and concepts related to digital financial services.								
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	
<b>Perceived Regulatory Support (PRS)</b>	My decision to utilize FinTech services is positively impacted by governmental initiatives and policies.								
	Government promotions highlighting the advantages of FinTech services make me more predisposed to using them								
	The backing of the government instills a greater sense of security and confidence in my utilization of FinTech services.								
	Government support plays a role in enhancing the accessibility and affordability of FinTech services.								
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	

## **Appendix B. Supplementary Material**



**አዲስ አበባ ዩኒቨርሲቲ**

**የቢዝነስ እና ኢኮኖሚክስ ኮሌጅ**

**ማኔጅመንት ትምህርት ክፍል**

**በመካከለኛ እና አነስተኛ ኢንተርፕራይዞች የሚሞላ መጠይቅ**

ውድ ምላሽ ሰጪዎች

ይህን መጠይቅ ለመሙላት ላይረጋችሁት ቁርጠኝነት አስቀድሜ ልባዊ ምስጋናዬን አቀርባለሁ የዚህ መጠይቅ አላማ የፋይናንሺያል ቴክኖሎጂዎች ትግበራ ና አጠቃቀም በአካታች ፋይናንስ ስርዐት ላይ ያለውን ተፅእኖ ለመገምገም እንዲረዳ በአምራች ዘርፍ ከተሰማሩ መካከለኛ እና አነስተኛ ኢንተርፕራይዞች መረጃ መሰብሰብ ነው።

ከዚህ ጋር በተያያዘ ከዚህ በታች ለተዘረዘሩት ጥያቄዎች ምላሽ በመስጠት እንድትረዱኝ በአክብሮት እጠይቃለሁ። የዚህ ጥናት ስኬት በአብዛኛው በእርስዎ እውነተኛ ምላሾች ላይ የተመሰረተ ነው። ስለዚህ በምላሾችዎ ውስጥ ታማኝ እንድትሆኑ በአክብሮት ተጠይቀዋል። በሂደቱ ውስጥ የተገኘው መረጃ በሚስጥር እንደሚጠበቅ አረጋግጣለሁ።

**ክፍል አንድ:** አጠቃላይ መረጃ

- 1. ጾታ:
  - A. ወንድ
  - B. ሴት
- 2. ዕድሜ
  - A. 18 -25
  - B. 26 - 35
  - C. 36-45
  - D. 46-55
- 3. የድርጅቱ እድሜ
  - A. ከ 5 ዓመት በታች

**SURVEY QUESTIONNAIRE (AMHARIC VERSION)**





		1	2	3	4	5	6	7
	የፋይናንስ ቴክኖሎጂ አገልግሎቶች ብድር የማግኘት አቅሜን አሻሽለዋል።							
		1	2	3	4	5	6	7
የዲጂታል ፋይናንስ እውቀት	ስለ ፋይናንስ ቴክኖሎጂ አገልግሎት ማተገበሪያዎች የተለያዩ ባህሪያት እና ተግባራት ጠንቅቄ አውቃለሁ።							
	ከዲጂታል የክፍያ ሥርዓቶች ጋር ተያይዘው ሊከሰቱ የሚችሉ አደጋዎችን እና የደህንነት እርምጃዎችን አውቃለሁ።							
	ከዲጂታል ፋይናንሺያል ግብይቶች ጋር የተያያዙ የተለመዱ ጉዳዮችን እንዴት መለ መፈለግ እንደሚቻል አውቃለሁ።							
	ከዲጂታል የፋይናንስ አገልግሎቶች ጋር የተያያዙ ውሎችን እና ጽንሰ-ሐሳቦችን አውቃለሁ።							
		1	2	3	4	5	6	7
የፋይናንስ ቴክኖሎጂዎች አጠቃቀም የቁጥጥር ድጋፍ ግንዛቤ።	የመንግስት ፖሊሲዎች የፋይናንስ ቴክኖሎጂ አገልግሎቶችን አጠቃቀም ውሳኔዎቼ ላይ አወንታዊ ተፅዕኖ አላቸው።							
	የፋይናንስ ቴክኖሎጂ አገልግሎቶች ጥቅሞችን የሚያገለግሉ የመንግስት ማስተዋወቂያዎች አገልግሎቶቼን ለመጠቀም የበለጠ እንድዳጓ ያደርጉኛል።							
	የመንግስት ድጋፍ የፋይናንስ ቴክኖሎጂ አገልግሎቶች አጠቃቀሜ ላይ የበለጠ የደህንነት ስሜት እና በራስ ማስተማሪያን ፈጥሮልኛል።							
	የፋይናንስ ቴክኖሎጂ አገልግሎቶችን ተደራሽነት ለማሳደግ የመንግስት ድጋፍ አወንታዊ ሚና ይጫወታል።							