ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

The Effect of Financial Inclusion on Inflation: The Case of Ethiopia

A Research Thesis Submitted to Addis Ababa University College of Business and Economics in Partial Fulfillment of the Requirements for Master's (M.sc) Degree in Financial Economics

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Declaration

I hereby confirm that, I Gebe Yemataw have carried out an independently research work on **The Effect of Financial Inclusion on inflation: The Case of Ethiopia** in partial fulfillment of the requirements for master's (M.sc) degree in financial economics.

This study is my own work that has not been submitted for any degree or diploma programs in this or any other institution, and that all references materials contained therein have been acknowledged.

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List of Acronyms

ADF - Augmented Dickey Fuller

ATM - Automated Teller Machines

COVID- Corona varies Disease

CUSUM- Cumulative Sum of Recursive Residuals

CPI- Consumer Price Indices

EIB- European Investment Bank

IMF- International Monetary Fund

LM- Lagragian Multiplier

NFIS-National Financial Inclusion Strategy

NBE- National Bank of Ethiopia

SME- Small and Medium Enterprise

POS- Point of Sale

RGDP- Real Gross Domestic Product

WB- World Bank

Abstract

Currently,financial inclusion is receiving significant attention in policy circles due to its role in fostering national development and managing inflation through effectivemonetary policy transmission in the economy. This study focuses on analyzing how financial inclusion impact inflation levels in Ethiopia. Both long and short-run error correction time series model were estimated in the datasets spanning from 2010Q3 to 2023Q2. The results indicated that an increased in financial inclusion throughits measurements i.e. number of financial access points, per 100,000 persons and utilization of savings account per 1000 adults, led to a reduction in inflation by encouraging individuals to use formal financial systems by promoting efficient monetary transmission channel in the entire economy. Additionally, variables exchange rate and money supply demonstrated a positive impact on inflation levels. To effectively manage inflation, predict price movements in the economy, and make informed decisions, financial policymakers should prioritize expanding financial inclusion by increasing access points and offering suitable and affordable financial products and services specifically targeting the excluded and underserved segments of society. Monitoring broad money and exchange rates are also crucial, as they have significant effects on prices.

Key words: *Financial access, financial usage, Inflation, Co-integration*

Chapter One
1. Introduction

1.1 Backgrounds of the Study

Any countries economic policy aims to achieve three main objectives: steady inflation, low unemployment, and economic growth.The nations will benefit from the economic policy when these goals are achieved. The central banks of the country facilitate monetary policy through managing money supply and interest rates of the economy to achieve various objectives such as maintaining price stability, fostering growth, ensuring financial stability, and managing inflation.These specific goals can be achieved the societies and business communities use formal financial services which is important for policy makers to manage and control price development through healthy monetary policy transmutation system in the economy(Mishkin, F.S, 2007).

The availability of useful and affordably priced financial products and services that meet people's and organizations' needs for credit, insurance, transactions, payments, and savings in an ethical and sustainable way is referred to as financial inclusion. In recent years, new technology and public and commercial initiatives have contributed to a significant global expansion in financial inclusion. As per the worldwide Financial Inclusion database,the number of adults without access to an account has steadily declined from 2.5 billion in 2011 to 1.7 billion in 2017 to 1.4 billion in 2021. As of 2021, 76% of the world’s adult population had an account. But because account ownership is nearly universal in high-income economies, virtually all unbanked adults live in developing economies.

According to Findex, 2021, Moving from access to usage of accounts is the next step for countries where 80% or more of the population have accounts (for example, China, Kenya, India, Thailand). These countries relied on reforms, private sector innovation, and a push to open low-cost accounts, including mobile and digitally-enabled payments. The COVID-19 pandemic also accelerated the adoption of digital payments in developing countries across the world. However, close to one-third of adults 1.4 billion are still unbanked in 2021. About half of unbanked people included women poor households in rural areas or out of the workforce.

Ethiopia has a comparatively low level of financial inclusion. Less than 20 percent of adults have a mobile bank account, and only 46percent of persons have saving accounts with banks or other formal financial institutions (Findex, 2021). The population to bank branch ratio in Addis Ababa was 1:15,7021 with 34.1percent of the banks located there. Public banks own 51percent of banking capital and 30percent of bank branches (Warkeneh, 2022). According to the EIB (2020), 40percent of medium-sized businesses and 70percent of microenterprises in Ethiopia have financial constraints. Adults who are wealthier have accounts that are twice as high as those who are poorer. In addition, there is a difference in account ownership between men and women.

An inclusive financial system has several advantages both at the macro and micro levels. Families with access to credit (loans) can arrange their income more effectively on a smaller scale. People can also budget their expenses and pay for educational plans with the help of microfinance, which will improve their future prospects. Furthermore, a nation can stimulate entrepreneurs to launch new small firms and boost national economic output by making loans more accessible (Brownbridge, 2017).

In order to protect against income shocks, financial inclusion enables people and businesses access the resources they need to finance investment and consumption. It also helps mobilize savings. According to Demirgüç-Kunt and Maksimovic (2007), financial inclusion also promotes labor and company formalization, which helps to lessen informality and has been favorably correlated with growth, innovation, job creation, and price stability.

According to (Mbutor and Uba 2013) on the nexus of monetary policy and financial inclusion show that the effectiveness of monetary policy has a causal relationship with financial inclusion, inferring that increased financial inclusion will improve the efficacy of monetary policy which helps stabilize the macro economy. Financial inclusion allows the expansion of monetary policy and helps policymakers forecast inflation better. Dienillah et al. (2018) provides a positive linkage of financial stability and financial inclusion based on income grouping. Findings suggest that strengthening financial inclusion will contribute to financial stability.

Henceforth, financial inclusion is an important pillar of the agenda to boost inclusive growth and to implement efficient monetary policy through managing inflation level in the economy.

1.2 Statement of Problem

A predominant characteristic of the economic climate in many emerging and developing economies is restricted access to the formal banking sector.Financial inclusion and its tools, according to (García and Jos´e ,2016), can generate a fast increase in credit, an unregulated financial system, and significant market risks that can cause inflation to rise and the macroeconomy to become unstable.

Households who are financially excluded have limited access to tools that make borrowing and saving easier. As a result, their inter-temporal consumption decisions may only be somewhat impacted directly by changes in policy interest rates.Low levels of financial inclusion make it harder for the central government to control aggregate demand because a significant portion of domestic money is not in the banking system. Throughout fact, there is proof that expanding SME accesses to official funding boosts the interest rate's influence throughout the economy, enhancing transmission of monetary policy and facilitating better maintenance of price stability.

Monetary authorities utilize tools that affect formal financial institutions but not those operating outside of this framework in order to achieve the desired policy objectives. Nonetheless, Ethiopia financial inclusion status indicates that vast majority of Ethiopians are not part of the country's regulated financial system.This could jeopardize the work done by central banks to create ainclusive and coherent monetary policy action and forecast the results of using tools to keep inflation in check. Although there might be direct and indirect connections between the official and informal financial sectors, these connections are unknown and unaccounted for, making it impossible to quantify problems like the creation of money (Yorulmaz, R., 2012).

Despite a higher rate of inflation, Ethiopia is making progress toward financial inclusion. Nonetheless, practitioner and academic communities have ignored the link between financial inclusion and inflation. The majority of research that has already been done on Ethiopia focuses on how the country's financial sector is developingdone by (Alemayehu et al., 2017; Aderaw and (Singh, 2016; Zewedu, 2014). Others, such as Ahmed &Batra, (2018); Berhane&Gardebroek, (2011); Berhanu& Thomas, (2000), concentrate on the function of microfinance and the link between financial inclusion and the decrease of poverty (Tilahun, 2023). This suggests that the current research on Ethiopia has a theme gap as it does not establish a relationship between inflation and financial inclusion.Besides, there are studies on the link between financial inclusion and inflation on other countries. However, to our best knowledge, the relation between financial inclusion and inflation has not been examined empirically the case of Ethiopia. This is one of the reasons that motivated us to do this research

1.3 Research Question

The following list contains the study research questions:

- What is Ethiopia's inflation and financial inclusion trend development looks like?
- What effectsfinancial inclusion on inflation?
- What effect does the additional macro-economic variables on inflation?
- What links between inflation and financial inclusion?

1.4 Objective of the Study

The main objective is to examine how financial inclusion has affected Ethiopia'sinflation level between 2010Q3 and 2022Q2.

Specifically, the following objectives are analyzed in the study.

- To asses inflation and financial inclusion level in Ethiopia
- To analysis the impact financial access and financial usage indicator on inflation
- To determine the impact of other macroeconomic indicator on inflation
- To see the granger causality between financial inclusion and inflation

1.5 Significance of the Study

The study findings are significant inputs forpolicy makers to design appropriate policyin Ethiopia because it will be helpfulto create efficient and effective monetary policy transmutation channel, to control inflation level, to facilityeconomic growth and reduce unemployment. The study will be helpful for scholars in the field who can utilize the constraints as a springboard to investigate the effects of financial inclusion on inflation in advanced way.

1.6 Scope and Limitations of the Study

The research is mainly focus financial inclusion factor in two dimensions from the financial access point and financial usage from the supply side prospective. While, this study is not considered the demand side financial inclusion factorssuch as regional penetration, public access to financial services, digital banks offerings, and challenges to financial inclusion. Another drawback is that financial inclusion is not quantifiable using a single variable or an index of financial inclusion measurement, which could influence the model's outcome.

1.7 Hypothesis

For the investigation, a hypothesis is developed, which is an anticipation of the researcher's beliefs and a relational statement that may be tested directly. The relationship between the general dependent which is inflation and independent financial inclusion variables under investigation is highlighted in the following hypotheses.

H1: Financial access points willnegatively influences the price level or inflation. Based on the past study findings and theoretical reasoning, the expected relationships between expansions of financial access point have lower inflation level.

H2: financial inclusion usage indicator credit account will have positively influences inflation while deposit account has negatively influence inflation level. This is based on theories and past researches works.

1.8 Organization of the Study

The structure of this studyprepared the following ways: the current section is introduction which contains background of the study, research problem, objective, significance, limitation, hypothesis and organization of the study; Section two literaturereviews. Section three data and research method; section four result and dissection; finally conclusion and way of forward.

Chapter Two

2 Literature Review

2.1 Introduction

Some literatures were investigated effect of financial inclusion on inflation level developing countries like Ethiopia even though the literatures were limited.The literature that has already written the link between financial inclusion and inflationand related articles in the field and how it affects different macro and microeconomic factors is included in this section.

2.2 Theoretical Literatures

2.2.1 Financial Inclusion Concept

Any definition of financial inclusion should include equal access to financial services and information. Any program that makes formal financial services available, inexpensive, and accessible to all segments of the population is referred to as financial inclusion. A segment of the populace has been excluded from the formal financial sector's offers over time due to several factors such as their income and volatility, gender, geography, activity type, or degree of financial literacy. There is thus a pressing need to unleash the potential hidden among people, organizations, and companies left out of the conventional financial sectors' services and products. Additionally, they must be investigated in order to strengthen their human and material capital, expand their capacity, and inform them of the many sources of revenue, manage riskassociated withtheir livelihoods (Triki and Faye, 2013).According to Mohan (2006), financial exclusion is the general term for when certain groups within society are unable to obtain appropriate, affordable, equitable, and secure financial products and services from mainstream providers.

Recent years have seen a significant increase in financial inclusion thanks to both public and commercial initiatives and new technologies. As per the worldwide Financial Inclusion Database, proportion of adult worldwide population holding an account at formal financial company’s increased from 51 percenttoward 69 percent between 2011 and 2017. For instance, during the same period, the percentage of adults in India who had an account more than doubled to 80 percent. Government-issued biometric identity cards were a major motivator, according to Demirguc-Kunt et al. (2018), as they reduced access costs and increased account ownership among adults without bank accounts. A thorough case study of how India's supply of digital financial infrastructure aided in financial inclusion can be found in D'Silva et al. (2019).

Developing countries have witnessed an increase in recent regulation to support the financial inclusion agenda through mandates, as regulators are generally more concerned with financial inclusion, including consumer protection, financial capability, microfinance regulation, savings promotion, SMEs' access to financing, and rural finance. One argument might be that since wealthy countries presently have higher levels of financial inclusion than other countries, they do not need to pursue more financial inclusion(Yorulmaz, 2012).

2.2.2. Financial Inclusion Role

According toKhan (2011), financial inclusion is a powerful tool that central banks can use to manage the execution of monetary policy effectively and stable financial systems in order to contain inflation. Because inclusion enables a broader segment of the economy to participate in the acknowledged financial system, it has a positive impact on the economy and facilitates the implementation and transmission of more dynamic monetary policy.

The selection of the price stability objective is one way that monetary policy should take a shift in financial inclusion into account. When establishing policy, central banks usually take a number of distinct goals into account. For instance, new keynesian frameworks are typically understood to suggest that the central bank should focus on both the production gap and inflation volatility (Clarida, et al. 1999). Indicators of risks to financial stability have received more explicit attention recently, as noted by Gourio et al (2017).

Wealthier economies have realized the need of financial inclusion as a tactical tool to alleviate and lower poverty, maintain price stability, which is a measure efficiency of monetary instruments to accomplish inclusive growth. Financial inclusion not only raises citizens' standards of living, gives those more opportunities, lowers poverty rates, and shields them from unanticipated bad events, but it also contributes to lower levels of corruption, lower levels of tax evasion by shrinking underground economy that create higher levels of credibility in financial contacts. It also guaranteesboth foreign and domestic, reaches the right people at the right time, lowers administrative expenses, and increases the efficiency of government functions like tax collection and pension payments. It also raisesafety in a country would not need to transfer with huge amounts of cash (Lochy, 2020).

A feature shared by almost all frameworks is a measure of inflation, the volatility of which is taken to indicate the stability of prices. Whether or not the economy has a clear aim for inflation, this is usually the case. Which inflation indicator should be used for monetary policy purposes is the question. For instance, there has been much debate over the years in advanced economies about whether the central bank should instead concentrate on a core inflation measure that leaves out some of the more volatile (and possibly mean-reverting) product categories from the assessment Bodenstein et al (2008). Food and energy are two categories of items that are typically omitted from core inflation in practice.

One tool for producing the financial fuel needed to create equitable economic growth is financial inclusion. More broadly, it fosters economic inclusion by creating jobs and bettering the living conditions of the impoverished with better amenities. More substantial saving and larger deposit basesof financial institutions are the results of increasing disposable income. As the share of the formal sector rises, greater financial inclusion facilitates more effective monetary transmission channels. Because financial decisions made by financially excluded are unaffected by central bank policy instrument, a sizable informal sector has a detrimental impact on the mechanism of monetary transmission.Therefore, adding these individuals to the financial system as a whole may have positive externalities that develop the efficiency of monetary policy. In a similar vein, monetary policy tools including adjustments to the savings and lending rates encourage financial inclusion (Anarfo et al., 2019).

In terms of the efficacy of various policy instruments, the degree of financial inclusion may have an impact on monetary policy. One way to conceptualize monetary policy tools is as either quantity based (such as credit amount or money supply level) or price based (like interest rates of different kinds). As shown by Khan (2011) and Tombini (2012), greater financial inclusion is probably going to make interest rate laws more effective at the expense of quantity-based rules.

As financial inclusion rises, interest rates should become more potent instruments for policy through a variety of pathways. First, a component of financial inclusion is credit availability, which comes with a cost in the form of interest rate that is susceptible to changes in the policy rate. A decrease in the policy rate lowers the cost of credit, which increases demand by encouraging more borrowing. Furthermore, the ability to fund investments from sources other than retained earnings is provided by financial inclusion; interest rate variations may have a greater impact on investment which is a crucial part of aggregate demand.Second, it is reasonable to assume that households with sufficient financial resources will transfer a portion of their income again, determined by the policy rate into interest-bearing bank accounts. Examined the percentage of broad money, or the stock of wealth that can be easily used for transacting and is in the form of currency, as a function of financial inclusion is one straightforward way to demonstrate the efficacy of this.

2.2.3. Public Good Theory of Financial Inclusion

Divergent viewpoints and beliefs exist on the recipients of the benefits of financial inclusion. According to research by Ozili (2018), the ultimate beneficiaries of financial deepening are members of society. Some academics, including Ghosh and Vinod (2017), contend that women have benefited greatly from financial inclusion outcomes. Nonetheless, a number of social groups in our communities are still unaware of the advantages of financial inclusion. For instance, young people in Kenya have expressed worries about the availability of financial services and products, particularly those that are included in the Credit Reference Bureau (CRB). Therefore, the public benefit theory of financial inclusion increase the scope of beneficiaries of financial deepening outcomes and its impact on inflation, which is a monetary policy indicator.

The need to consider the availability of unrestricted formal financial products and services as a public good is highlighted by the public good theory of financial inclusion. No member of an economy should be denied access to or benefits from formal financial services, according to the public good theory, which is based on the World Bank's (2018) perspective on financial inclusion recipients. This theory's application lends credence to Swamy's (2014) assertion that financial inclusion cannot benefit a relatively small segment of the populace inside an economy. Nonetheless, the welfare of all residents should be its main objective. As a public good, financial inclusion ought to help everyone, including low-income households, youth, women, and even those employed in the formal financial sector, claims Ozili (2018). With this strategy, economies can attain equity by drastically reducing the wealth gap between the rich and the poor.

However, by stating that considering financial inclusion as a public benefit does little to solve the disadvantages of financial exclusion, Otioma, Madureira, and Martinez (2019) weaken the public good theory of financial inclusion. Furthermore, Oluoko-Odingo and Mutisya (2018) contend that presenting financial inclusion as a public benefit can influence the diversion of public funding that would otherwise be committed to more significant initiatives such as renewable energy. In conclusion, financial deepening may not satisfy the course's primary purpose if it is seen as a public good in East African countries, as supported by the public good theory of financial inclusion, due to its lack of long-term sustainability. As a result, by advancing the public good school of thought on financial inclusion, systems theory of financial inclusion provides a substantially superior strategy for achieving effective financial inclusion.

2.2.4. Systems Theory of Financial Inclusion

In order to achieve financial inclusion, social, economic, and financial systems are essential. Ozili (2018) asserts that the theory of financial inclusion systems shows that robust social, economic, or financial subsystems already in place in an economy enable the achievement of financial inclusion outcomes. According to Bongomin et al. (2017), financial systems are essential to accomplishing goals related to financial inclusion. Monetary policymakers are one of the subsystems in this setting that affects how well financial inclusion works.

According to Aduda and Kalinda (2012), an economy's financial and economic institutions can be modified to enable financial innovations such as financial inclusion. Thus, systems theory is crucial to financial inclusion because it supports financial inclusion's role in improving the efficiency of economic subsystems, such as monetary policymakers in East African countries. Ozili (2018) explains the benefits of systems theory of financial inclusion. According to the author, as far as financial inclusion is concerned, the theory recognizes the roles that the social, economic, and financial systems that are now in place play in an economy. This theory is also pertinent since it takes into account the effects of financial inclusion on other subsystems, such the economy's monetary policy authority.However, one limitation of the systems theory of financial inclusion is that it fails to acknowledge elements that exert influence beyond the confines of the financial, social, and economic sub-systems.

2.2.5. Keynes's Theory of Monetary Policy

The theoretical basis of this study is firmly based in the monetary policy theories of the Keynesian school of thinking. According to Kriesler and Lavoie (2016), a Keynesian viewpoint suggests that economic decisions made by the public and private sectors have an impact on aggregate demand. According to Begonia and Ireland (2019), a key component of Keynesian economics is the theory of aggregate demand and how it affects output and inflation. In summary, monetary policy decisions have a significant impact on aggregate demand.

As per Rochon's (2017) assertion, the classical money quantity theory leads to the Keynesian theory of monetary policy, which proposes that the money supply and price level are not directly associated. However, the Keynesian school of thought believes that the money supply and actual GDP are only indirectly related. According to Kriesler and Lavoie (2016), Keynesians believe that by establishing an expansionary monetary policy, economists can increase the amount of loanable money available through formal banking systems, lowering interest rates.As a result, when interest rates fall, demand for all investments and interest-sensitive consumer products rises, boosting GDP. This theory is pertinent to the current study because it explains how financial inclusion increases total investment spending by enabling the implementation of suitable monetary policies, such as expansionary monetary policies. Kriesler and Lavoie (2016), on the other hand, remain skeptical of Keynesians' failure to emphasize the effectiveness of monetary policy in the economy in achieving the major goals of financial inclusion, such as increasing GDP and decreasing unemployment.

2.3 Price Stability

Two significant economic phenomena that are detrimental to the economy are inflation and deflation. In essence, inflation is a broad, general increase in the prices of goods and services over time that reduces the value of money and thus its purchasing power. The antithesis of inflation, known as deflation, is commonly described as a scenario in which there is sustained weakening in the level of prices overall. In the absence of inflation or deflation, price stability is defined as the typical situation in which prices do neither rise nor fall over time.How is inflation calculated? An economy contains millions of distinct prices. These prices are always fluctuating, essentially reflecting shifts the supply and demand aimed at certain merchandises and services. As a result, they provide a measure of relative scarcity of those particular products and services.

A central bank can accomplish price stability, economic growth, financial stability and high employment through the effective use of monetary policy. They take into account two factors that demonstrate how the degree of financial inclusivity affects monetary policy. The first trade-off that the policymaker must make is between production volatility and inflation. Second, people can stabilize their consumption during uncertain times by using the financial system to access savings and credit. Because people can't keep up with their spending when their income declines, governments should lessen output volatility with reduced degree in financial inclusion. Therefore, in that scenario, policymakers prioritize stabilizing output over stabilizing inflation (Mehrotra&Yetman, 2014).

Price stability promotes higher living standards by reducing uncertainty about general price developments, improving relative price transparency, lowering inflation risk premia in interest rates, eliminating unnecessary hedging, reducing distortions in tax and social security systems, increasing the benefits of cash holdings, and preventing the arbitrary distribution of wealth and income. Put another way, central banks help to achieve greater economic goals by maintaining price stability.

For a variety of reasons, the governing body of any nation chose to make available to public quantifiable description of price stability. First, the term makes the monetary policy framework more understandable (i.e., transparent) by elucidating how Governing body interpretactivities assigned to it by the Agreement. This helps to guide the public in setting its own expectations for future price developments. Secondly, the public may hold the government accountable by using the notion of price stability as a precise and quantifiable benchmark.Price developments that deviate from the concept of price stability can be discovered, and the ECB must then explain why these deviations exist and how it aims to restore price stability within a reasonable time frame.It is possible to identify price trends that deviate from concept of price stability, in which case the ECB would have to explain why those deviations occurred as well as how it plans to restore level of inflation in a reasonable amount of time.

2.4 Empirical Literature

There is an indirect correlation between price stability and financial inclusion. This is due to the fact that changes in financial institution behavior brought about by price stability through monetary policy impact the degree of financial inclusion (Yetman 2018). There are three ways that a rise in the interest rate, or monetary policy rate, could be detrimental degree of financial inclusion. One is that the demand for formal financial services especially formal credit will decline as interest rates rise. It will deter many unbanked adults from entering the formal financial system and result in a drop in the number of persons applying for formal loans.They would prioritize marketing their product offers to particular clients who can afford the expense of financial services, ignoring low-income clients and potential clients who are unable to pay for them. This will cause the latter group to be financially excluded. Three, if financial sector agents primarily depend on the monetary policy rate to set the price of financial services, increase the rate could result in an increase in the cost of all financial services (Yetman 2018). It follows that an increase in the monetary policy rate may have the unintended consequence of undermining the objective of financial inclusion by decreasing the supply and decreasing demand for vital financial services.

Given the attention financial inclusion has received in the last ten years, Oleschak (2021) and Oz-Yalaman (2019) assessed the effect of financial inclusion on inflation and tax revenue. They discovered a significant and positive associationamong financial inclusion and tax revenue as well as a surprisingly small number of theoretical and empirical studies that examine whether governments adjust taxation and inflation in accordance with level of financial inclusion. The results, which show a positive association between tax income and financial inclusion and a negative relationship between inflation and financial inclusion, corroborate the researchers' hypothesis.

Regression model analysis was conducted by Mbutor and Uba (2013) to examine the influence of financial inclusion on monetary policy in Nigeria from 1980 to 2012. The findings confirmed the hypothesis that increasing financial inclusion will enhance the efficacy of monetary policy by reducing inflation as the ratio of total loans rises. The fact that banks prioritize profitability over financial inclusion when opening branches, however, explains why the study found that the coefficient of the number of bank branches has the incorrect sign.

In their 2014 study, Mehrotra and Yetman used cross-sectional data from Global Findexexamined financial inclusion and the best monetary policy for more than 130 economies. Their research revealed that, provided the central bank takes both factors into consideration and adjusts monetary policy to maximize the trade-off between them, financial inclusion positively affects the ratio of output volatility to inflation volatility.

Lenka and Bairwa (2016) looked at how financial inclusion affected the monetary policies of the South Asian Association for Regional Cooperation (SAARC) nations between 2004 and 2013. Using principal component analysis, the study created financial inclusion indices to gauge how accessible financial inclusion is in the SAARC nations. In addition, panel-corrected standard error model, fixed effect model, and random effect model were applied to the analysis. The inflation rate and financial inclusion were found to have a strong negative correlation, according to the empirical results of Generalized Least Square (GLS) estimate. It was also shown that the SAARC countries' inflation rates were adversely correlated with interest rates and exchange rates.

According to El Sherif (2019), Granger Causality tests, the Vector Error Correction Model (VECM), and simple trend analysis were used to assess the influence of financial inclusion on the efficacy of monetary policy in Egypt over a 17-year period from 2000 to 2017. The findings demonstrated a negative correlation between Egypt's inflation rate and financial inclusion. Additionally, it was discovered that there is a reciprocal relationship between monetary policy and financial inclusion in Egypt, with financial inclusion having a major impact on the efficiency of monetary policy as well as the other way around.

Evans (2016) conducted an empirical analysis over a ten-year period, from 2005 to 2014, examining the effects of financial inclusion on the effectiveness of monetary policy in a sample of fifteen African nations. The findings showed that monetary policy efficacy is what drives financial inclusion, rather than the other way around. Financial inclusion is not much impacted by monetary policy effectiveness.

According to Mehrotra and Yetman (2014), greater financial inclusion makes interest rates a more effective tool for policymakers and makes the process by which central banks can stabilize price levels easier. Higher degrees of consumption smoothing are made possible by inclusion, which makes it easier for households to react to fluctuations in interest rates by modifying their loan and savings levels. Increased financial inclusion may also persuade households to shift their savings from tangible assets to deposits.

Khan (2011) concurred that interest rates become a comparatively important and reliable instrument for policymakers at higher levels of financial inclusion. Money stock begins to shift from currency in circulation to interest-bearing deposits in the banking system as financial inclusion rises. This makes it possible for interest rates to govern a significant amount of economic activity. According to Khan (2011), the more informal the economy, the more difficult it will be to apply and disseminate monetary policy since more households and small company owners will make their own judgments without taking the monetary policy activities of central banks into account.In order to survey people's financial transactions, financial inclusion also pushes people to switch from a cash economy to a bank economy (cashless). As a result, Anti-Money Laundering regulations can be effectively applied to most financial transactions throughout the economy.

Agoba and Bugri-Anarfo (2017) made an effort to review the body of research on monetary policy, financial development innovation, and financial inclusion. In order to find pertinent gaps and suggest future research directions, a survey of the literature published between 2007 and 2015 was conducted. Key themes in this field of study, the methodology used, and the geographical distribution of the studies were identified. The study suggested that panel data be used to evaluate the effect of financial inclusion on monetary policy. A similar review was conducted by Suman (2017), who covered a number of financial inclusion-related topics, including policies and challenges, determinants and factors influencing financial inclusion, evaluation and measurement, and finally the effects of financial inclusion. The review comprehensively reviewed recent research on financial inclusion conducted worldwide.Through this study, it was discovered that, in contrast to monetary policy and financial stability, the majority of studies support the idea that financial inclusion has a significant and positive impact on economic growth and development. Accordingly, Suman (2017) suggested that the impact of financial inclusion on monetary policy should be the main area of interest for future study and the gap that has to be filled.

Based on the studies mentioned above, it is evident that more research is needed to fully understand how financial inclusion affects price stability. While some studies have examined this relationship, the majority of them conducted cross-national analyses rather than applying their findings to a single nation.

2.5 Financial Inclusion and Price Stability in Ethiopia

2.5.1 Financial Inclusion in Ethiopia

Ethiopia, located in the Sub-Saharan region, is not an anomaly. Financial organizations are growing in scope and range of services offered, including banks, insurance companies, and microfinance. Ethiopia has embraced financial inclusion as a cornerstone of the growth of its financial system, since the concept has recently gained significant traction worldwide. The financial system is shallow and concentrated in urban areas, despite the advancements in the financial sector development brought about by expanding access to financial technologies (e-money, mobile banking, electronic payment systems, etc.) and opening financial institutions across the nation Gashaw&Gebe (2017).

One of the main factors influencing economic growth and the decrease of poverty is formal financial inclusion. It makes it possible for individuals to save money for unexpected financial shocks and their long-term well-being, to get credit to start and grow enterprises or pay for school, and to get vital insurance like health and crop insurance. Formal financial inclusion in Ethiopia is still much lower than in other East African nations, despite a steady increase in the percentage of adult population with a financial institution account from 22 percent in 2014 to over 46 percent in 2022 (GSMA, 2023).

The improvement of the financial system is a factor in the expansion of the business environment. Doing business in Ethiopia is extremely risky, with the main challenge facing businesses being their inability to obtain credit. According to a Kappeler et al. (2018) analysis on recent trends in the African banking industry by the European Development Bank, 40 percent of SMEs and 70 percent of micro-firms in Ethiopia have trouble obtaining financing.

One of the main components of the Ethiopian government's plan to increase financial inclusion is mobile money. Even though a bank-led approach for mobile banking services was initially tested in Ethiopia in 2015, their reach has remained restricted. In 2020, regulatory reform made it possible for non-bank entities to provide mobile money services. Given that MNO-led mobile money services in other African nations, most notably Kenya, Ghana, and Uganda, have had great success furthering financial inclusion in areas where traditional financial institutions have failed, this is a critical development for Ethiopia's financial inclusion (GSMA, 2023).

Approximately 46 percent of adults over the age of 15 have accounts with regulated financial institutions. Less than 5 percent of people have mobile accounts, demonstrating how young people are when it comes to using digital banking and payment systems. This is significantly less than that of the neighboring east African nations of Kenya, Uganda, and Tanzania, where 80 percent of the population over the age of 15 has a mobile account or other digital payment system, while Tanzania and Uganda have 50 percent of the same. The Ethiopian government has passed laws pertaining to digital payment systems as part of its efforts to bring about structural change and digitize the economy (Findex, 2022).

2.5.2 Price Stability in Ethiopia

The National Bank of Ethiopia's monetary policy is primarily focused on supporting Ethiopia's sustainable economic growth and preserving price and exchange rate stability. When making decisions about investments, consumption, foreign trade, and saving in the private sector, price stability serves as a stand-in for macroeconomic stability. Lastly, employment and economic growth are supported by macroeconomic stability (NBE, 2009).

High inflation in Ethiopia is currently one of the most pressing policy concerns, having had a significant impact on households since the mid-2000s. Following the highest rate of inflation in recent memory in 2008, the period from 2013 to 2017 was marked by a single-digit, non-accelerating rate of inflation. Non-food price increases in 2018 were exacerbated by subsequent increases in food costs. Food and non-food inflation rates in February 2022 were 41.9% and 22.9%, respectively, for a total rate of inflation of 33.6%. With domestic and worldwide incidents mostly affecting the supply of commodities, there is reason to expect that prices in Ethiopia will continue to climb at a faster rate. Even a slight increase in prices should raise policy concerns for two reasons, putting aside the argument over whether such a spike in the overall price level could impede the nation's economic progress (seid, 2022).

The redistributive consequences of rising inflation on consumers are a significant consequence. In Ethiopia, inflation that isn't related to food is generally more consistent and lower. On the other hand, high rates of food price inflation are mostly linked to periods of high inflation in Ethiopia. This could suggest that households that allocate a bigger percentage of their income to food suffer more from inflation than households that spend less on food.

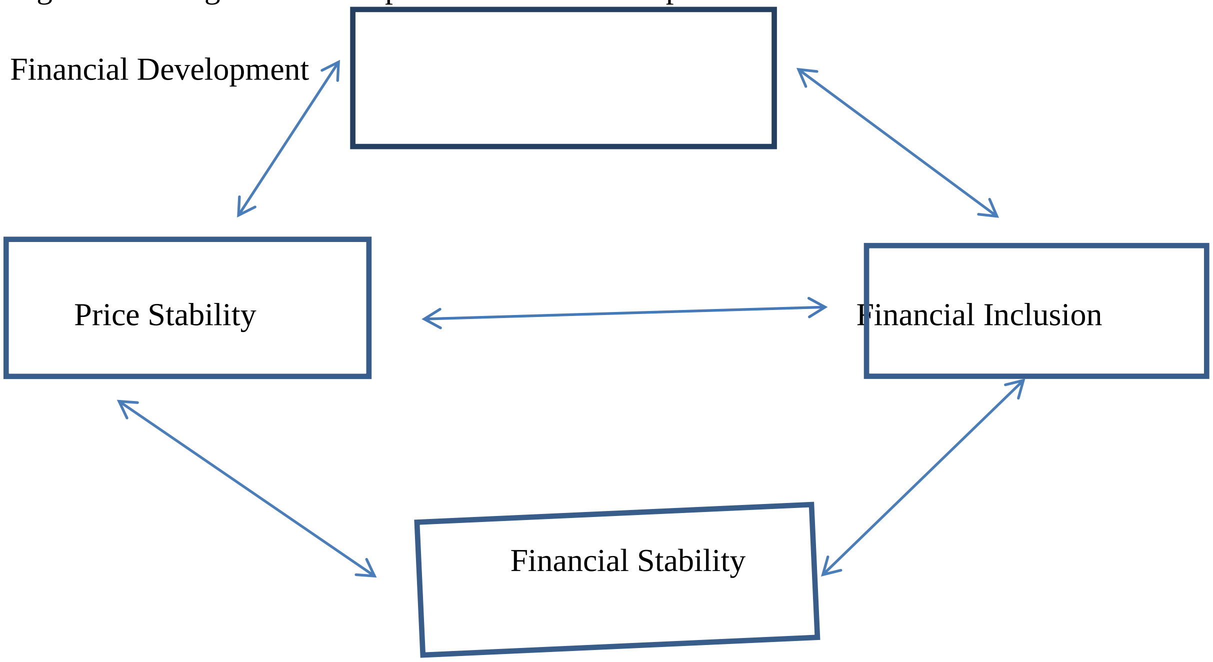
Rising inflation has significant redistributive consequences on consumers. Non-food inflation in Ethiopia is reasonably constant and typically lower than food inflation. In contrast, periods of high inflation in Ethiopia are mostly connected with a high rate of inflation in food prices. This could imply that inflation has a greater impact on households that spend a larger proportion of their income on food than households that spend a larger portion of their income on non-food products. The consumer price index (CPI) report from Ethiopia's Central Statistical Services (CSS) is based on the total amount of money spent on consumption, divided by the aggregate share of commodities. According to the 2016 Ethiopian Household Income, Consumption and Expenditure (HICE) survey, households spent an estimated 53.5 percent of their total expenditure on food and non-alcoholic beverages. It is projected that households in Addis Ababa's capital spent 43.2 percent of their overall consumption budget on food and non-alcoholic drinks.

2.6 Conceptual Framework

Researchers like Matsebula and Sheefeni (2022) and Kouki et al. (2020) sought to characterize the detrimental impact of financial inclusion on financial stability, resulting in continuously high inflation, subsequentto global financial catastrophe of 2008.

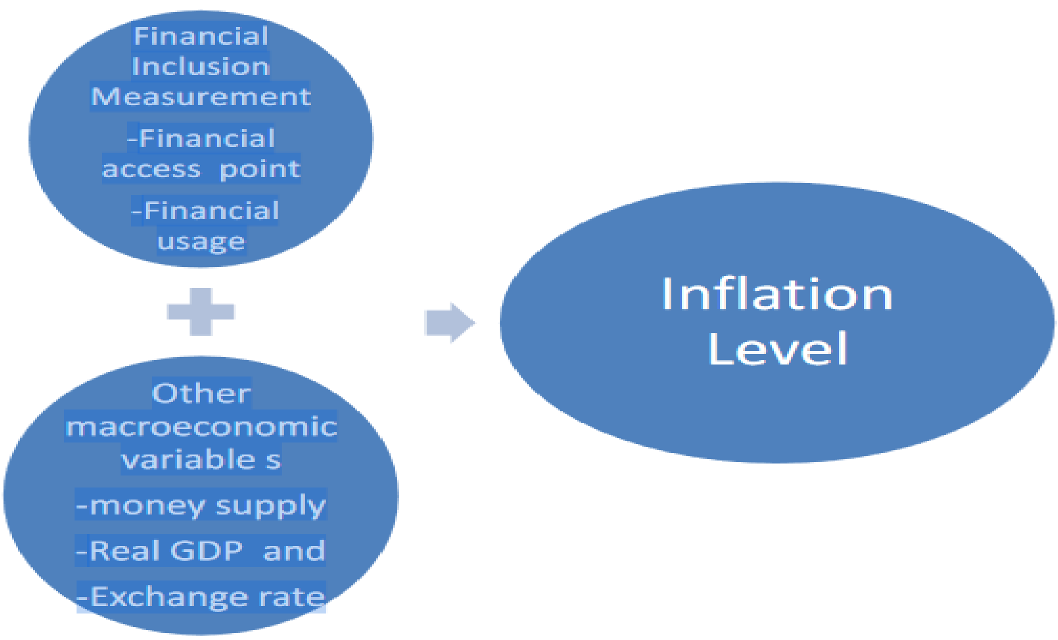
The purpose of this research is to investigate the relationship between price stability and financial inclusion in Ethiopia. The conceptual framework created by Oanh et al. in 2023 for their own purposes is where the relationship originates.

Figure 2.1: Diagrammatic Representation of Conceptual Frame Work



Source:Oanh et.al, 2023

The conceptual frame works of the study variable relationship summarized as follows:



Source: Authors summary

Chapter Three

3 Data and Methodology

3.1 Introduction

The data and methodology parts are important to investigate whether financial inclusion impacts on inflation which described in this chapter. Specifically, this section includes research design, model specification, definition and measurement of variables, data type and source,pre and post estimation technique of the model.

3.2 Research Design

The processes used in research initiatives to gather, assess, analyze, and present data are known as research designs (Creswell & Plano, 2007). A standard schematic connects conceptual research questions to relevant and doable empirical research. Stated differently, the methods for gathering and analyzing data, as well as the potential answers to each of these study questions, are required by the research design. The current research project sought to investigate the impact of financial inclusion on general price levels or inflation in Ethiopia. To meet the study's objective, quantitative methods are used to assess the collected data, with descriptive and econometric models used to figure out the significance of the variables being studied and coefficients of each variable under consideration.

3.3 Nature and Sources of Data

The data is collected from domestic sources and international organizations data base. Specifically, the data sources are National Bank, Central statistical services and World Bank data base. The variables used in this study for analysis have been selected based on empirical evidence and economic theory. The dataset on inflation indicator CPI, financial inclusion indicator such as financial access point, credit account and saving account as well as control variables like broad money supply, real GDP and official exchange rate is taken at National Bank of Ethiopia. The population data to compute financial access point per 100,000 adult and saving and credit account per 1000 adults are taken from central statistical services. The missing observations of some variables are filled by referring World Bank data base and trend method.

3.4 Model Specification

Given the theoretical and academic studies on the causal relationship of financial inclusion and inflation addressed in the literature review, this study's econometric model is based on Anthony et al.'s (2018) econometric model. The change in the Consumer Price Index (CPI) is a measure of inflation. The general price level will be regressed against financial inclusion indicators along with additional control variables to determine whether financial inclusion has a substantial impact on inflation in Ethiopia. As a result, the econometric model was utilized to conduct empirical investigation of the impact of financial inclusion on the overall inflation level. The model specification of the natural logarithm form of all variables are presented as equation (1)

$$\ln CPI_t = \beta_0 + \beta_0 \ln FI_t + \beta_2 \ln X_t + \varepsilon_t \text{ ……....................}\mathbf{(1)}$$

Where β_0 the intercept coefficient estimate, CPI_t consumer price indices, FI_t: measure of financial inclusion indicators which is financial access and usage at time t, X_t stands for additional macroeconomic variables considered as control variables, ε_t is the error term of the model.

This observed model is enhanced with the presence of control variables such as real GDP, broad money supply and official exchange rate combined with financial inclusion indicators such as financial access point and financial inclusion usage indicator. Equation (2) provides the specific version of Equation (1) with the natural logarithm transformation form that is utilized for regression.

$$\ln CPI_t = \beta_0 + \beta_0 \ln Fccess_t + \beta_2 \ln Fusage_t + \beta_3 \ln M2_t + \beta_4 \ln RGDP_t + \beta_5 OER_t + \varepsilon_t \text{ ………..}\mathbf{(2)}$$

Where $Faccess_t$ refers financial access per 100,000 adult and $Fusage_t$ refersfinancial usage which is saving account per 1000 adult and credit account per 1000 adult: those financial access and usage variables are proxy measure of financial inclusion in access and usages of financial instrument. Whereas, $M2_t$ is broad money supply $RGDP_t$ is Real Gross domestic Product; and OER_t is official exchange rate are control variables.

3.4.1. Description and Definition of Variables

i. **Dependent Variables**

This study makes use the change in consumer price indices used as a measure of inflation or general price level in the economy. Inflation indicator (change in CPI) is an indicator of price and macroeconomic stability that determine consumers' purchasing power which is computed as the price of basket of commodities in the selected representative market place surveyed and developed an index by central statistical service to measure inflation.

ii. **Independent Variable**

The dependent variables are categorized in two parts. The first is financial inclusion indicator variable and the second other macroeconomic that combined in the research analysis.

Financial inclusion indicator

One variable cannot sufficiently capture the entirety of financial inclusion, so it cannot be used to measure it by one variable. Hence, a variety of metrics are employed to assess financial inclusion. Banking customer, geographic penetration, accessibility of financial services to the general public, and financial service utilization are the most often utilized indicators by various research (Anarfo E.B., et al, 2019).

As of 2004, financial inclusion was surveyed by the IMF under two main headings: financial usage and financial access indicators. The demand-side, also known as usage-side, assesses how much individuals use financial services. The following statistics fall under the financial usage category: the number of outstanding commercial bank deposits and loans, number of commercial bank borrowers per 1000 adults, and the number of deposit accounts with commercial banks per 1000 adults.

The supply of financial services is estimated by financial access.The indicators are numbers of commercial banks branches per 1000km^2; numbers of commercial bank branches per 1000 adults number of ATMs per 1000km^2 and number of ATMs per 1000 adults. Based on this information the financial inclusion variable under this studs are saving account per 1000 adult and credit account per 1000 adult applied for financial inclusion usage indicator and the access points of regulated finical institutions which is the sum of bank branches, microfinance branches, Insurance branch ATMS and bank agents per 100,000 adults used as financial access point indicator for financial inclusion.

Macroeconomic Variables

The macro economic variables that affect inflation level directly or indirectly included in this study as independent variables are broad money, real gross domestic product and official exchange rate. We understand from different empirical and theoretical literatures those macro-economic variables could affect inflation level. The detail information of each variable presents in table 3.1.

Table 3. 1: Study Variable Description

Variable		**Notation**	**Description**	**Expected Sign**
Inflation indicator	Consumer Price indices	CPI	The general price level in the economy	Dependent variable
Financial inclusion indicator	Access to Finance	Faccess	All formal financial access points i.e. banks, microfinances, insurance, ATM, POS machine and agent banking's per 100,000 Adults.	Negative
	Usages of Financial Product	Saving account	Saving account per 1000 adult	Negative
		Credit account	Credit account per 1000 adult	Positive
Control variable	Real Gross Domestic Product	RGDP	Measure of overall economy	Ambiguous
	Broad Money Supply	M2	Measuring the amount of money circulating in an economy	positive
	Official Exchange Rate	OER	The value of the national currency relative to the value of foreign currency	Positive

3.5. Method of Data Analysis

The data collection is examined and characterized using descriptive statistical methods, including trend analysis and mean, standard deviation, minimum, and maximum values. In contrast, this study performs an econometric analysis based on quarterly time series data to estimate the model. The time series model estimation is employed in this study because it considers quarterly time series features. As a result, the study's specified objectives are met by using 52 observations estimated between 2010 quarter three and 2023 quarter two. The estimation was computed using E-view 12.

3.5.1. Pre Estimation Statistical Test

i. Stationary Test

Pre-estimating data through testing stationary and seasonality will assist in determining the applicability of various theories and any issues with the data. Data producing process for many economic variables is recognized to be characterized by stochastic trends in the literature, which could lead to false conclusion if the time series features are not thoroughly examined. If the mean and auto covariance of a time series are not time dependent, the series is considered stationary. A series with a unit root is considered non-stationary if it is not stationary.Unit root test is the formal procedure used to determine whether a series is stationary. Numerous well-known tests based on individual time series are available for this purpose. One such test is the augmented Dickey-Fuller (ADF) unit root test (Dickey & Fuller, 1979, 1981), which is used for the study variables.

The ADF unit root test (non-stationary) hypothesis is presented as follows: H_0: $\gamma = 0$ (Unit root) versus H_1: $\gamma \neq 0$ (not unitroot).

If our time series data is non-stationary, we must make it stationary by differentiating and de-trending it. Therefore, the Augmented Dickey-Fuller (ADF) test has an estimation equation.

$$\Delta Y_t = \delta + \beta_t + \alpha y_{t-1} + \sum_{i=2}^{m} \Delta y_{t-i} \varepsilon_t \text{..} 3$$

Where, δ and β are intercept and coefficient, respectively y_t is the time series variable, Δ is a difference operator, t is a linear trend and ε_t is the error term. Then, if the absolute value of the ADF test statistic exceeds the critical threshold, we discard the null hypothesis of non-stationary and conclude that the series is stationary. On the other hand, we fail to reject the null hypothesis, implying that the series is non-stationary.

ii. **Co-integration Test**

Engle and Granger (1987) found that a linear combination of two or more non-stationary series can be stationary. Non-stationary time series are said to be co-integrated if they can be combined in a stationary linear fashion. In other words, if the variables are co-integrated, there is a long-run relationship and a force to converge to long-run equilibrium. The Johansen co-integration test (Johansen, 1988) and the EngleGranger single equation test method (Engle & Granger, 1987) are the two often used procedures to evaluate whether there is a long-run relationship between variables.

According to Cheung and Lai (1993), the Johansen approach outperforms the Engle-Granger single equation test method due to the maximum likelihood strategy's advantageous large and finite sample features. The Johansen co-integration test models each variable in the system as a function of all lagged endogenous variables. The Johansen technique uses two ratio tests to determine the number of co-integration relationships: a maximum eigenvalue test and a trace test. Although they do not always yield the same number of co-integrating vectors, both tests can be used to determine the number of co-integrating vectors present. If trace and maximum eigenvalue statistics provide different results, the maximum eigenvalue test result is preferred since doing separate tests has advantages.

Therefore, the Johansen co-integration approach could apply for this study due to its advantage stated above over Engle Granger single equation co-integration method.

3.5.2. Long run and Short run Error Correction Model

It has been said that if a linear combination of non-stationary series is found to be stationary (co-integrated one would be correct to just go ahead and interpret the results of a static model like equation without paying further attention to the time series properties and short-run dynamics of the model. This notwithstanding, a major argument has been that since equilibrium (i.e. steady state) is rarely observed, it may be necessary to consider the short-run evolution of the series and dynamics of adjustment.

The liner combinations of the variables are stationary because they are co-integrated the long run model estimation representation just like model specification cited in equation 2 as follows.

$$\ln CPI_t = \beta_0 + \beta_1 \ln Fccess_t + \beta_2 \ln Fusage_t + \beta_3 \ln M2_t + \beta_4 \ln RGDP_t + \beta_5 OER_t + \varepsilon_t \quad \textbf{(3)}$$

The short run error correction model representation which is the dynamics of short run shocks to correct or adjustment to the long run is

$$\Delta \ln CPI_t = \beta_0 + \beta_1 \Delta \ln Faccess_t + \beta_2 \Delta \ln Fusage_t + \beta_3 \Delta \ln X_t + \delta ECT_{t-1} + \varepsilon_t \quad \textbf{(4)}$$

Where β_i the short run model coefficients: ΔCPI_t the change in consumer price indices, $\Delta Faccess_t$ and $\Delta Fusage_t$ measure of the change financial inclusion an indicators of financial access and usage at time t, ΔX_t stands for the change in additional macroeconomic variables as such as RGDP, money supply and exchange rate control variables, δ is the coefficient of speed of adjustment the short run shock ECM_{t-1} error correction term and ε_t is the error term of the model.

3.5.3. Post Estimation Statistical Test

The standard properties of the model are validated using a series of post estimation or diagnostic tests. This study will include the residual diagnostic tests, which include serial correlation (using the LM test), normality, and heteroscedasticity tests, as well as the model stability condition (using CUSUM test).

Serial Correlation Test: The model used in time series analysis should meet the assumption of no serial correlation. The Durbin Wastson test will be used to determine whether there is serial auto-correction.

Heteroskedasticity Test: This is used to test for the homoscedasticity of residuals in the model.

Normality Test: The residuals of the selected model should be normally distributed.

Model Stability Check: The study uses the cumulative sum (CUSUM) and cumulative sum of square (CUSUMSQ) tests to verify the model's stability after confirming that long-run relationships exist between variables.

Chapter Four

4. Result and Discussion

This chapter offered the study's findings, along with commentary. As stated in the methodology section, the analysis employed both descriptive and regression techniques. The descriptive analysis of variables involved is shown in sub section 4.1, which visualizes the development of the main study variable and provides descriptive summary statistics. Subsequently, in section 4.2, econometric analyses starting from unit root tests, co-integration tests, and then long and short-run error model estimation confirmed the appropriateness of the model described in the study.

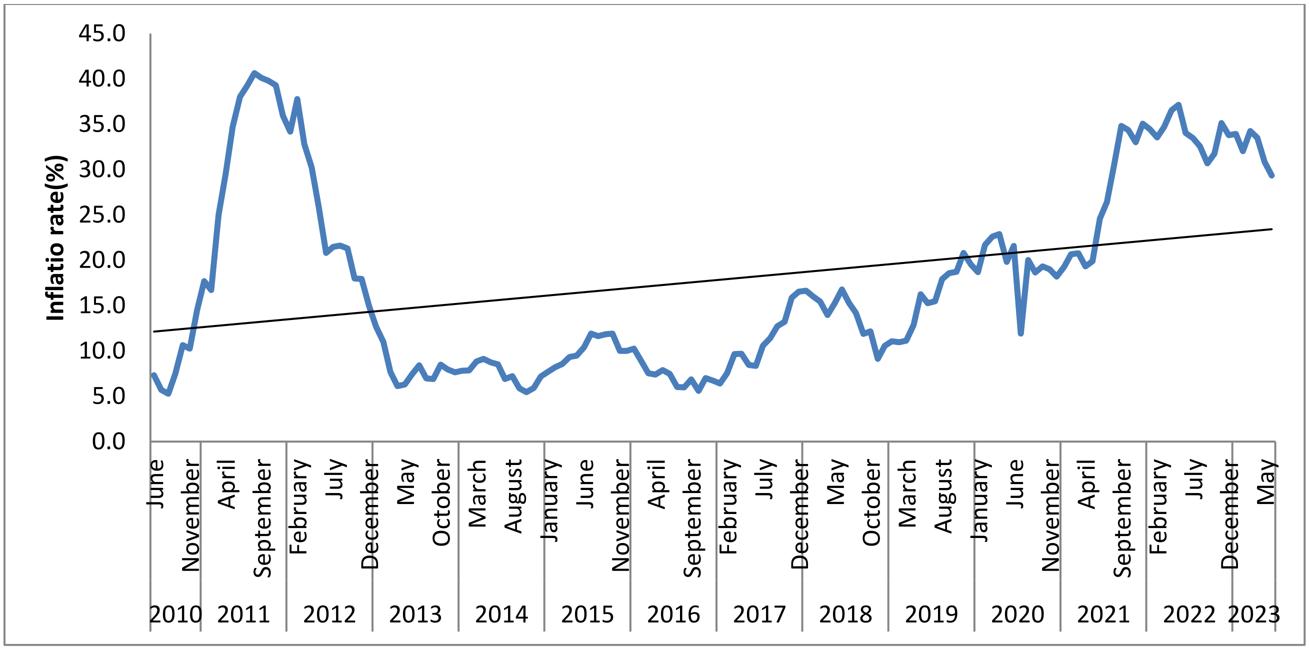
4.1. Descriptive Analysis

A descriptive statistical analysis was conducted using trend and summary statistics to discuss the current development of the main study variable, inflation, as a dependent variable and financial inclusion indicators, such as financial access points and financial usage variables, were examined, along with money supply, real gross domestic product, and exchange rate. Before performing econometric analysis on the data, descriptive analysis is required to verify its nature, as stated in the next subsection.

4.1.1. Inflation Development

The monthly inflation development during the study period is shown in figure 4.1. The graph illustrates how high level of inflation was at the start of the study period, in particular in 2011 and 2012. The devaluation of the exchange rate in October 2011 may have contributed to raise import commodity prices, which could explain the period's significant inflation. In a similar vein, increased inflation was also reported in years following to 2021. The COVID-19 pandemic, the conflict in northern Ethiopia, and Russia-Ukraine war may have had an impact on recent inflation. These reasonsaffect inflation through disruption of global supply chains, particularly in the areas of energy and fertilizer prices, as well as fluctuations in foreign exchange rates impact domestic prices by impeding the import of basic goods and raw materials.Overall, the Ethiopian inflation trend over the research period demonstrated a consistent long-term upward trend.

Figure 4.1: Trends of Inflation Development in Ethiopia

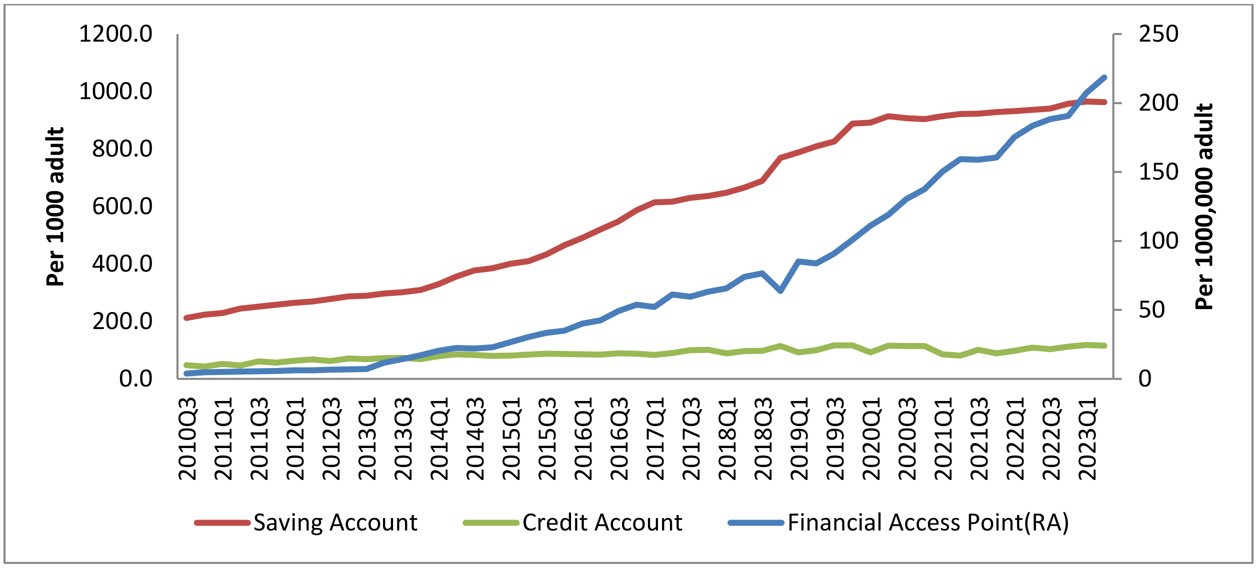


Source: Author's computation using Excel

4.1.2. **Financial Inclusion Development**

This study used financial inclusion measures that are classified into two separate aspects. These are measures of financial usage and financial access points. The total number of bank branches, microfinance branches, insurance branches, ATMs, point-of-sale (POS) machines, and bank agents is the number of financial inclusion access points per 100,000 adult. Conversely, adults who open and utilize deposit and credit accounts in regulated financial institutions at a rate of one per 1000 adults serve as indications of financial usage. The financial inclusion development shown in Figure 4.2 indicates that while number of credit accounts per1000 individuals showed stagnation, the number of savings accounts per1000 adults exhibited a sharply increasing trend. This may suggest that by increasing the number of bank accounts they open, financial institutions are concentrating more on deposit mobilizations. Nevertheless, the customer's loan distribution could not be distributed equitably and the financial sector credit policy looks stringent because the number indicated that the credit account remained unchanged during the study period. Figure 4.2 financial inclusion access dimension showed that number of financial access points per100,000 adults was on the rise, especially following the 2019quarter three sharp increases. This could be attributed to the expansion of financial access through the opening of new branches, ATMs, and agents, as well as the National Bank of Ethiopia's licensing of new banks and microfinances to enter the market.

Figure 4.2: Trends of Financial Inclusion Indicators Financial Access and Usage.



Source: Author's computation using Excel

4.1.3. **Descriptive Summery Statistics**

The findings presented in Table 4.1 indicate that the quarterly average score of inflation rates from third quarter of 2010 to second quarter of 2023 was 17.2 percent. The quarterly inflation rate ranged from 6.1 percent at the minimum to 40.0 percent at the extreme recorded. Its standard deviation, or average quarterly variability, was 10.1 percent. This may suggest that, although fluctuating year over year, inflation is fluctuating more than in sub-Saharan African countries, where the average inflation rate is 15percent (Aaron, 2023). The descriptive result also revealed that, out of 100,000 adults, the average formal financial access points were 71. These included bank branches, microfinance, insurance, agents, ATMs, and point-of-sale (POS) machines. There were 219 financial contact points per100,000adults at the maximum and there were 4 financial access points per 100,000 adults at the minimum. The average variation in financial access points per 100,000 adults during a quarter was 64. In comparison to the national financial inclusion targets of 405 access points per 100,000 persons reached in 2020, the results indicate a low level of financial access points per 100,000 adults (NBE, 2017). The average number of adults with a credit out of every1000, is 87, while the saving account indicators for financial inclusion are 588 per 1000 adult. Additionally, the regulated financial institution's maximum number of credit and deposit account holders per 1000 adults was 118 and 965, respectively. In contrast, the minimal values for credit and savings accounts were 43 and 212 per 100,000 adult populations, respectively during the study period. Real GDP, the total money supply, and the official exchange rate were additional variables in the study. Their quarterly average values were 419.1 billion Birr, 710.0 billion Birr, and 26.4 Birr per USD, respectively.

Additionally, table 4.1 shows kurtosis, which establishes the distribution's normality, and skewness, which quantifies the symmetry of distribution. All the variables were therefore positively skewed. This suggests that the distribution of observations has a greater mean value than the median value and is concentrated to the right of normal skewness. Similarly, every variable in the table is leptokurtic, meaning that it is more peaked than normal and has a positive excess kurtosis value.

Table 4.1: Summaries Results of Descriptive Statistics

Statistics	Inflation (%)	Financial access per 100,000 adult	Deposit account per 1000 adult	Credit account per 1000 adult	Broad Money in Billions of Birr	Official Exchange rate (Birr/USD)	Real GDP in Billions of Birr
Mean	17.2	70.6	588.2	86.7	710.8	26.4	419.1
Median	16.4	52.9	600.8	86.9	515.2	21.7	416.1
Maximum	40.0	218.5	965.0	118.0	2170.8	55.7	628.0
Minimum	6.2	3.8	212.0	43.0	108.4	13.1	231.6
Std. Dev.	10.1	64.2	270.1	19.8	565.0	11.5	119.8
Skewness	0.5	0.8	0.1	0.01	1.003	1.3	0.1
Kurtosis	1.8	2.3	1.4	2.4	3.0	3.9	1.7
Observations	52	52	52	52	52	52	52

Source: Author’s computation using Eviews 12 output

4.2. Econometrics Analysis

Under this section data output from econometrics results are presented. Accordingly, results from pre-estimation analysis tests such as stationary test and co-integration test, and post-estimationdiagnostic tests of the given model are presented. These includeauto correlation test, heteroskedasticity test and stability test were applied in the long and short run estimation model.

4.2.1. **Unit root Test Result**

Testing stationary is the initial step in every econometrics analysis. The standard unit root test for the Augmented Dicky-Fuller (ADF) test is used to examine the sequence of integration of the variables under consideration and to determine the degree of stationary. An intercept and trend alternative were used to test the unit root. Moreover, MacKinnon (1996) crucial values serve as the foundation for rejecting the null hypothesis. Table 4.2 shows the output of ADF test that were achieved.

Table 4.2: ADF Test Result

Variable	At level I(0)		At first difference I(1)	
	ADF statistics	P-Value	ADF statistics	P-Value
lnCPI	1.77	0.996	-3.83	0.024
LnFaccess	-0.98	0.937	-7.41	0.001
Lnsavingacc	-0.97	0.999	-5.04	0.001
Lncreditacc	-2.25	0.19	-7.54	0.000
LnM2	-0.35	0.907	-3.47	0.013
lnRGDP	-0.37	0.986	-6.58	0.000
Ex.rate	-0.56	1.0	-3.43	0.058

Source: Source: Author's computation using Eviews 12

Table 4.2 provides evidence that the study's variable was non-stationary at the level, or I (0), but stationary at the first difference, or I (1). P-values of the variable that were larger than 0.05 for non-stationary data and less than 0.05 for stationary data verified table 4.2. As a result, the variable was suitable for carrying out additional analysis and all the study variable data series was stationary at the first difference.

4.2.2. **Johansen co-integration Test Result**

Co-integration occurs when a linear combination has a lower order of integration than the variables itself. One of the most important co-integration difficulties is determining whether the co-integrating vector's disturbance term has a unit root. This demonstrates a long-term link between the variables, sometimes known as a co-integrating relationship.

The Johansen test was used by the study to determine co-integration because all of the variables were integrated of order one (based on the unit root result). The co-integration rank, or simply the number of co-integration relationships, is the goal of the test. Despite its dependence on asymptotic features, this test is regarded as the best for co-integration. In order to determine whether the null hypothesis (Ho) contains co-integration: There is an underlying relationship between the variables chosen, as implied by the null hypothesis rejection when series are not co-integrated. Both the trace statistics and the max-Eigen statistics results shown in Table 4.3 are subjected to Johansen co-integration test.

The result presented in Table 4.3 founds that the combination consumer price indices and financial inclusion indicators i.e. financial access and usage variables together with other variables real GDP, Broad money supply and official exchange rate have indicated that three co-integrating equations confirming in trace statistics and two co-integrated Maximum Eigen value results at 5% level of significance. This co-integration equation implies that three liner combination or long run relationship exists between the study variables. Since the finding shows that a stable equilibrium relationship is present due to the existence of co-integrated relationship.

Table 4.3: Johansen Co-integration Trace Statistics Tests

Hypothesized Number of Co-integrating	Eigenvalue	Trace Statistic	.05 Critical Value	Probability
None	0.61	162.48	125.61	0.000
At most 1 *	0.55	114.61	95.75	0.001
At most 2 *	0.44	74.21	69.81	0.021
At most 3	0.27	44.81	47.85	0.094
At most 4	0.27	28.47	29.79	0.070

At most 5	0.18	12.31	15.49	0.142
At most 6	0.04	2.10	3.84	0.146

*Indicates at most three co-integrating equation at 0.05 level
Source: Source: Author's computation using Eviews 12

Table 4.4: Johansen Co-integration Max-Eigen Statistics Tests

Hypothesized Number of Co-integrating	Eigenvalue	Max-Eigen Statistic	.05 Critical	Probability
None	0.61	47.87	46.23	0.03
At most 1 *	0.55	40.39	40.07	0.04
At most 2	0.44	29.40	33.87	0.15
At most 3	0.27	16.33	27.58	0.63
At most 4	0.27	16.16	21.13	0.21
At most 5	0.18	10.20	14.26	0.19
At most 6	0.04	2.10	3.84	0.14

*Indicates at most two co-integrating equation at 0.05 level
Source: Source: Author's computation using Eviews 12

4.2.3. **Long Run Model Estimation**

Following the determination of whether the study variables exhibit stable long-term relationships based on the outcomes of the Johansen co-integration test, the primary goal of investigation is to analyze the influence of financial inclusion indicators, such as financial access and usage, on changes in the overall price level orinflation.

Table 4.5 explains the impacts of financial inclusion through financial access point and credit & saving account financial usage indicator, money supply, real gross domestic product and official exchange rate on the change general price level or consumer price indices which is an indicator of inflation. In the table 4.5 the model result shows that, there is a negative and significant association at one percent statistical level between financial access points and inflationlevel in line with expectedsignplaced in the long run model in the methodology. This suggests that there is an inverse relationship between financial access point indicators and changes in the overall inflation level in the economy. The result clarifies a one percent increases or expansion in financial access point i.e. branches of banks, microfinance, insurance, ATM terminal, agent banking and POS are reduces level of price by 0.13 percent in the estimationmodel.Likewise, the findings of financial inclusion usage indicators i.e. deposit account coefficients as expected negative and statistically significant at one percent statistical level of significance. This result founds that a one percent increasing in saving account at the formal financial institution the inflation level declined by 0.43 percent. Conversely, the credit account coefficient showsthat statistically insignificant but positive as expected with inflation in the model specification. This indicates that, similar findings are happen just like descriptive trend analysis the credit account is not significant change throw-out the study period even if the inflation level fluctuates.

The long run model result shows broad money supply is positively relation with the change in price or inflation at 5 percent level of significant. The result reveled that a 1% increases in the money supply the change in price level or inflation were increases by 0.23 percent. While, real Grosse domestic product is insignificant affect inflation in the model estimation. The results of exchange rate Birr/USD significance and positive associated with price change at 1% level of significant.The result showed that a 1 percent increases in official exchange ratethat increases the level of domestic price in an economy by 0.02%.

Based on the study's findings, it was discovered that, in the long run regression model, 98% of the variation in price or inflation was explained by the official exchange rate, the broad money supply, the real gross domestic product, the number of financial access points per 100,000 adults, the number of savings accounts per 1000 adults, and the number of credit accounts per 1000 adults. The model's standard error is low and the overall model coefficients are significant at the one percent statistical significance level, according to the F statistics result.

Table 4.5: Estimated Long runRegression Results

Variable	Coefficient	Standard error	t-stataistics	Probability
C	-3.25	3.28	-0.99	0.32
lnFACCESS	-0.13	0.05	-2.46	0.02**
Lnsavingacc	-0.43	0.13	-3.34	0.00*
Lncreditacc	0.06	0.07	0.88	0.38
LnRGDP	1.36	0.87	1.56	0.12
LnM2	0.37	0.26	2.43	0.04**
Ex.rate	0.02	0.003	5.21	0.00*
AdjR-squared	**0.98**			
S.E. of regression	**0.044**			
Prob(F-statistic)	**0.000**			

*&**Significant at 1 percent and at 5% statistical level, respectively

Source: Source: Author's computation using Eviews 12

4.2.4. **Diagnostic Checking**

Following the long-run model's estimation, the mode's resilience has been examined using serial correlation test, heteroscedasticity test, and cumulative sum of squares of recursive residuals (CUSUM and CUSUM Q) test for stability.

Table 4.6 Test for Heteroskedasticity and Serial Correlation

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	8.64	Prob. F(6,45)	0.158
Obs*R-squared	9.32	Prob.Chi-Square(6)	0.156
Scaled explained SS	6.91	Prob.Chi-Square(6)	0.329
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	29.34	Prob. F(2,43)	0.135
Obs*R-squared	27.85	Prob.Chi-Square(2)	0.135

Source: Source: Author's computation using Eviews 12

As shown in Table 4.6 the test forheteroskedasticityusingBreusch-Pagan-Godfreyand serial correlation LM test in the long run model. The null hypothesis states there are no presences of serial correlation and hetroskedasticity in the model since there is no evidence to rejectthe null hypothesis. The F-statistic and Chi-Square variants of the white test statistic all supported the finding that there was no evidence of serial correlation or heteroscedasticity in this specific investigation. Since the Chi-Square and F-statistic results' p-values are larger than 0.05.

Figures 4.3 and 4.4 shows a similar outcome for the cumulative sum of squares of recursive residuals. The plot of the CUSUM test did not cross the crucial limitations, as shown in the first figure, which displays the results of the CUSUMSQ and CUSUM tests. Likewise, the graphs do not breach the lower and upper critical boundaries, according to the CUSUM square and CUSUM sum of squares test. As a result, we can say that there is no structural break and that predictions for the long and short runs are steady. As a result, the estimated model's outputs are accurate and effective.

Figure 4.3: Cumulative Sum of Recursive Residuals Test for Stability

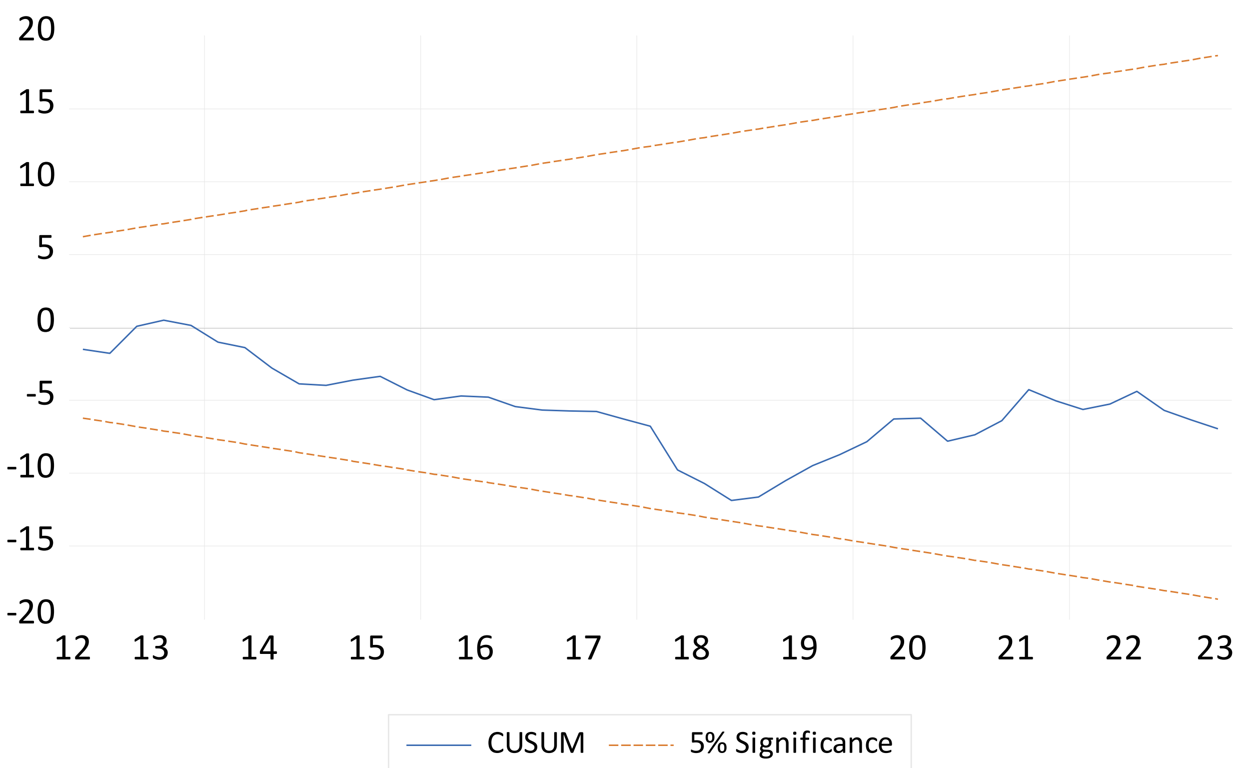
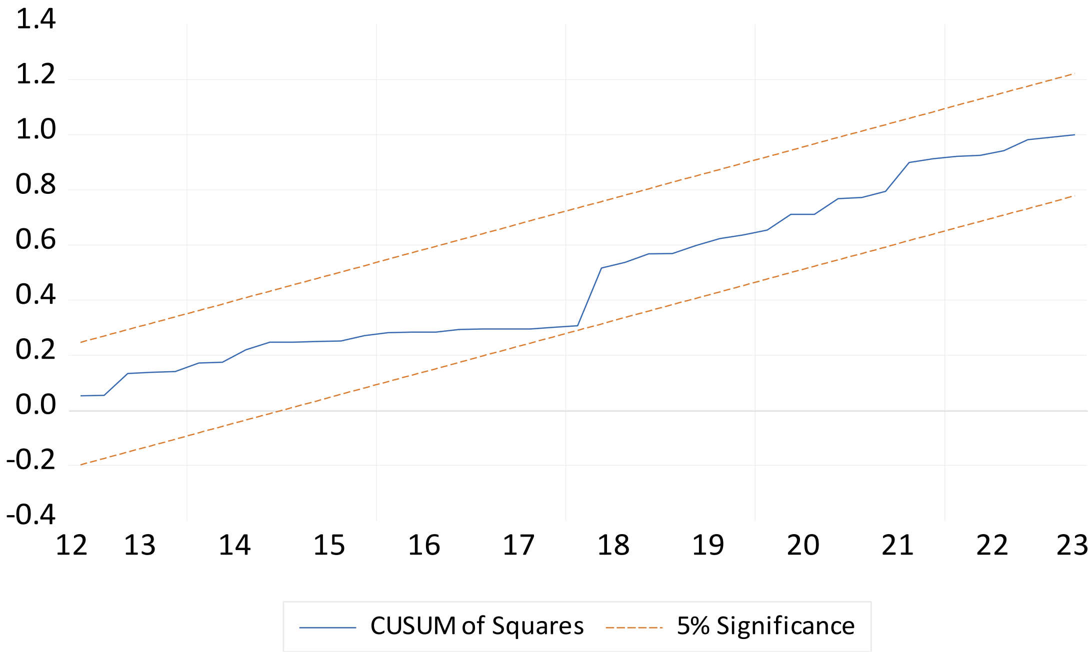


Figure 4.4: Cumulative sum of Squares of Recursive Residuals Test for Stability



4.2.5. **Short RunError Correction Model Estimation**

This subsection estimates the short-run error correction needed to achieve long-term equilibrium and to make clear how quickly any deviations from the long-run equilibrium will be adjusted. In table 4.7, the short-run error correction model is estimated.

Table 4.7: Short Run Model Estimation

Dependent Variable: D(lnCPI)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.03	0.01	1.72	0.092
D(LNFACCSS)(-1)	-0.05	0.04	-1.40	0.166
D(LNsavingacc)(-1)	-0.43	0.17	-2.44	0.018**
D(Lcreditacc)(-1)	0.05	0.03	1.64	0.106
D(LNM2)(-1)	0.05	0.15	0.36	0.718
D(LNRGDP)(-1)	0.76	0.77	0.98	0.327
D(OER)(-1)	0.01	0.004	2.72	0.009*
ECM(-1)	-0.23	0.09	-2.37	0.022**

R-squared	0.41	Mean dependent variable	0.04
Adjusted R-squared	0.32	S.D. dependent Variable	0.02
S.E. of regression	0.02	Akaike info criterion	-4.43
Sum squared residual	0.02	Schwarz criterion	-4.13
Log likelihood	121.05	Hannan-Quinn criteria.	-4.317
F-statistic	4.35	Durbin-Watson stat	1.88
Prob(F-statistic)	0.001		

*&**Significant at 1 percent and at 5% statistical level, respectively
Source: Author's computation using Eviews 12

The coefficient of determination (R-squared), as shown in table 4.7, is 0.41, meaning that, in the short term, changes in the financial inclusion indicator along with the money supply, exchange rate, and real gross domestic product account for roughly 41% of the variation in inflation. The regression equation is deemed suitable for usage based on the coefficient of determination (R-squared), and the independent variable is selected to ascertain the dependent variable. Nevertheless, the value of R^2 and Adjusted R^2 does not imply that inflation level because the study did not control for other causes of inflation in the model (apart from the financial inclusion indicator and other factors included in the model).

Furthermore, the Durbin-Watson statistic (1.88) eliminates any uncertainty regarding the presence of autocorrelation in the computed model. Additionally, the evidence demonstrates that the ECT value of -0.23 is significant; hence, it suggests that approximately 23% of the variation (the disequilibrium) resulting from the shock of the preceding period is corrected (converges back) to the long-run equilibrium each quarter. This comparatively slower rate of adjustment suggests that there is less consistent, long-term link between the variables.

Table 4.7 shows that, in contrast to the long-run effect, there is a significant influence that runs from the independent financial inclusion variables to the dependent inflation level variable in the short run model. The only financial inclusion metric that shows a positive impact on inflation is the number of deposit accounts per 1000 adults. The outcome suggests that for a 5 percent rise in bank account openings, inflation will drop by 0.43 percent in the short run. However, in the short run scenario, the financial access point per 100,000 adults and the credit account per 1000 adults do not support their major impact on inflation. While, the official exchange rate is one of the other explanatory factors influencing inflation at the one percent level statistical significant. According to the exchange rate coefficients, a one percent decline in the value of domestic currency relative to the US dollar causes inflation to rise by 0.1 percent. In the short term model, other independent variables like the money supply and economic growth have not shown statistical significance.

Diagnostic tests are conducted to see if the estimated short-run model can be verified. The following table presents the residual diagnostic tests for the null hypothesis that there is no serial correlation in the residuals and no heteroskedasticity in the disturbance term at a 5% level of significance.

Table 4.8: Test for Serial Correlation and Heteroskedasticity

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	11.20	Prob. F(2,41)	0.16
Obs*R-squared	5.77	Prob.Chi-Square(2)	0.37
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	14.68	Prob. F(7,43)	0.310
Obs*R-squared	2.48	Prob.Chi-Square(7)	0.402
Scaled explained SS	10.56	Prob.Chi-Square(7)	0.735

Source: Author's computation using Eviews 12

4.2.6. Granger Causality Test

Having finished the estimation of short run model, the test for bidirectional causality between variables has been tested as illustrated in the following table.

Table 4.9: Pair Wise Granger Causality Test

Null Hypothesis:	**F-Statistic**	**Prob**

LNFAP does not Granger Cause LNCPI	0.73	0.732
LNCPI does not Granger Cause LNFAP	4.78	0.013
LNDA does not Granger Cause LNCPI	0.37	0.690
LNCPI does not Granger Cause LNDA	1.12	0.334
LNCA does not Granger Cause LNCPI	5.71	0.006
LNCPI does not Granger Cause LNCA	2.58	0.086
LNM2 does not Granger Cause LNCPI	6.58	0.003
LNCPI does not Granger Cause LNM2	0.90	0.412
LNRGDP does not Granger Cause LNCPI	1.18	0.314
LNCPI does not Granger Cause LNRGDP	0.47	0.627
OER does not Granger Cause LNCPI	0.45	0.639
LNCPI does not Granger Cause OER	0.44	0.642

Source: Author's computation using Eviews 12

The Granger Causality test results in Table 4.9 show the effect of variables on one another. The test was performed to predict whether the former variable Granger causes the later variable orotherwise. The null hypothesis consumer price index which is an indicator of inflation does granger cause on financial access point per 100,000 adults, deposit account per 1000 adult, credit account per 1000 adult, money supply, economic growth and exchange rate and vice-versa, at 5% significance level. The result confirms that, credit account per 1000 adult and money supply variables were granger causes price level. On the other hand, consumer price level granger causes financial access point per 100,000 adult according to the granger causality test result provided in table 4.9. The rest causality test shows doesn't granger cause exists at 5% level of significant.

As a result, this finding suggests un-directional causal relationship between financial inclusion and general price level. The implication of the finding is that financial inclusion measurements i.e. credit account opening contains useful information for predicting the short-term values of price movement in the economy at 5% level of significance.

4.3. Discussion

To further analysis the model, the findings of the long and short run error correction model result discussed in detailed in this sub section. It links the findings of this study to earlier empirical literature findings that are presented in the literature review section in order to understand the findings in terms of how financial inclusion measurement in the financial access and usage dimension joined with other macroeconomic variables that affects inflation level.

4.3.1. Financial Inclusion and Inflation

According to the study's findings, which are displayed in the long-term model, there is a statistically significant correlation between the financial inclusion measurements of financial access points per 100,000 adults and deposit accounts per 1000 adult of the financial usage indicator and the level inflation the case of Ethiopia. Similarly, merely one deposit account per 1000 adults has a considerable impact on the inflation rate in the short run scenario. However, in the long run model credit account per 1000 adult and the short run model, financial inclusion metrics like credit account per 1000 adults and access point per 100,000 adults had no statistically significant impact on inflation.

The long run empirical model founds that; a financial inclusion indicator which is access to finance is negativelyaffectingthe change in consumer price indices or inflation. This implies an expansion of formal financial access points like bank branch, microfinance branch, bank agent, ATM machine, POS machine and insurance branch could have diminish the rise in general price level or inflation. This study finding is comparable to results found by Mbutor and Uba (2013) in Nigeria.The author confirmed higher level of financial inclusion can improve the monetary transmission channel by converting large informal financial service to formal way and helps policy makers to make better decision or makes monetary policy more effective. The results are also in line with the authors ofKoreshkova (2006) and Nicolini (1998),thesy discovered that expanding financial access points more effectively increases financial inclusion while also lowering the ideal level of inflation and raising tax revenue.

The finding supported the theoretical prediction that bank savings and financial inclusion usage indicators would have a negative, substantial impact on the increase in inflation or the general price level. This suggests that there is a greater likelihood of lowering economic inflation in society due to the growing number of people who have bank accounts in the financial sector. The growth in deposit accounts is crucial for gathering currency outside the banking industry in order to control inflation and mobilize resources for investments.This study's findings are consistent with those of Khan (2011), who discovered that the greater the shift in deposit accounts from the informal to the formal financial sectors, the more difficult it is for monetary policy to be implemented and disseminated through the informal sector because more households and small business owners will make independent decisions without taking the actions of central banks' monetary policy into account. In order to track financial transactions, financial inclusion also pushes people to switch from a cash economy to a bank economy (cashless).

However, as predicted in the variable description chapter three, the credit account financial inclusion utilization measurement showed a positive effect but not significant on the level of inflation. This suggests that credit account is not a determinant factor of the rate of inflation in Ethiopian economy because the creditors from the formal financial institutions are limited due to stringent credit policy for the public and SMES to access credit. This result is not similar findings with that of Evains (2016), who found that the effectiveness of monetary policy is negatively impacted by financial inclusion as measured by credit account size.

4.3.2. **Other Macroeconomic Variable and Inflation**

The results of the study, which are displayed in the long term model, indicate that the exchange rate and money supply have a positive and considerable impact on the level of inflation. However, the actual gross domestic product has not significant effect on the rate of inflation. Only the official exchange rate has the ability to impact the level of inflation in the economy in the short run model. On the other hand, money supply and real GDP were found to have no impact on inflation in the short run error correction estimation.

The money supply has a positive and significant impact on inflation at the five percent level in the long run model, as was mentioned in the previous section. This suggests that a rise in the money supply causes inflation to rise. This indicates that, the economy's massive infusion of new money could be the source of the increased price level. In particular, the economy experiences inflationary pressure when money is given to the market by the central bank. This may be a persistent occurrence in Ethiopia, where the government's need to encourage economic growth and fund the budget deficit caused by low tax collection bases raises aggregate demand, which raises living standards and causes macroeconomic imbalances. This result aligns with the (Muchok, 2018). He discovered that the money supply, GDP per capita and financial inclusion index all strongly influenced the inflation rates in the nations of East Africa.

Similarly, the result indicates that positive and significantly influences exchange rate for an increase in level of prices or inflation. According to the coefficient results, inflation increased by 0.2 percent for a 1% surge in birr per US dollar in the long run model. This suggests that as domestic currency depreciates relative to foreign money, the price of domestic goods rises. Ethiopia frequently faces this situation as a result of the import dependent economy like capital goods and other necessities such as fuel, fertilizer, and raw materials for industry. As a result, it appears that Ethiopian inflation is directly impacted by currency depreciation.

Chapter Five

5. Conclusion and Recommendation

5.1. Conclusion

Given the progressively global and country level attentionfinancial inclusion strategy plays crucial role in economic development, poverty discount, inflation management and financial stability for developing and emerging nations. This leads the higher financial inclusion enables effective monetary transmission channels to increasing money circulation in the formal financial sector and helps to manage price development in the economy. Therevealing of empirical literature in the area, this study was introducedto clarify the effect of financial inclusion on inflation level in Ethiopia has been studied.

To achieve the research objective, hence to test the research hypothesis, the study used secondary time series data covering from 2010 quarter three to 2023 quarter two using E-views 12 software. The study applied both long and short run error correction models using ordinary least square estimation technique. Under this study, financial inclusion is quantified using two dimensions: Financial access point per 100,000 adult and usage of financial products i.e. saving account per 1000 adult and credit account per 1000 adult regress with change in consumer price indices which is measurement of inflation. The ADF unit root test and Johansen test for co-integration result founds that, variables studied in this paper were stationary at order one and have the co-integrating equations at 5 percent significance level. This result indicates that there exists long run stable relationship between the combined study variables.

The long run model showed that financial access point and the level of inflation had a significant but inverse relationship. This suggests that expanding more financial sector branches, like banks, microfinance, insurance, agent banks, ATMs, and other formal financial access point may help to lower inflation level in the economy. The studyreveals that financial inclusion usage indicators, such as an increase in the opening saving account, have a major influence on the economy's ability to control inflation.These results demonstrated that raising the nation's degree of financial inclusion helps manage inflation by bringing money from outside banks into financial sector and boosting the efficiency of monetary policy tools. The analysis of the influence of other macroeconomic factors reveals that both money supply and exchange rate movement positively contribute to the level of inflation. However, there was no statistically significant correlation among credit account and gross domestic product on the level of inflation.

The nexus between financial inclusion and price level result confirms that, credit account per 1000 adult and broad money supply granger causes price level. On the other hand, consumer price level granger causes financial access point per 100,000 adult. Hence there is unidirectional relationship between financial inclusion and price level. The rest causality test shows doesn’t granger cause exists at 5% level of significant.

5.2. Recommendation

Based on the outcomes the study, the subsequent points are recommended:-

- To implement effective monetary policy and manage inflation level, the government of Ethiopia should promote the expansion of access points such as branches, agents, ATMs, POS devices.
- As the expansion of financial access points alone cannot help to archive the full-fledged financial inclusion, it should be supplemented by formulating and offering saving and credit products and services which are more suitable and affordable to the excluded and underserved segments of the society. In this regard, the finance sector should focus on consumers’ centric products and services design and development;
- The financial police makers should devise ways to convert the large informal sector to formal by designing suitable financial access points and promoting financial products and services targeting these communities. This would likely enhance effective monetary policy transmission mechanism and reduces the level of inflation in the economy; and
- The government could give attention on the exchange rate and money supply polices that promotes effective monetary policy implementation or healthy price movement.

4. Reference

AlemayehuGeda, Tony Addison and GetnetAlemu (2017). The Current State of Ethiopian Financial Sector and Its Regulation:What is New after a Decade and Half Strategy of Gradualism in Reform, 2001-2017.Working Paper.

AderawGashayie and Manjit Singh, (2016). Development of Financial Sector in Ethiopia: Literature Review. Journal of Economics and Sustainable Development, Vol.7, No.7, 2016, ISSN 2222-2855 (Online).

Agoba, A. M., Sare, Y. A., &BugriAnarfo, E. (2017). Financial Inclusion and Monetary Policy: A Review of Recent Studies. Ghana Journal of Development Studies, 14, 231-254.

Ahmed, A. &Batra, G.S (2018).Performance Analysis of Microfinance Institutions in Ethiopia. International Journal of Business and Management Invention (IJBMI), 7(4), 55-66.

Anarfo E.B., et al., Monetary policy and financial inclusion in sub-Sahara Africa: a panel VAR approaches. Journal of African Business, 2019. 20(4): p. 549-572.

Berhane, G., &Gardebroek, C. (2011). Does microfinance reduce rural poverty? Evidence based on household panel data from northern Ethiopia. American Journal of Agricultural Economics, 93(1)

Bernanke B.S. and Gertler M. (1995).The credit channel of monetary policy transmission.Journal of Economic perspectives. p. 27-48

Brownbridge M. (2017).The impact of Financial Inclusion on the interest rate channel of the monetary policy transmission mechanism.Bank of Uganda, Working Paper Series.

Camara N. and Tuesta D. (2014).Measuring financial inclusion: A multidimensional index.BBVA Research Paper.

Clarida, Richard, JordiGalí, and Mark Gertler. (1999) .The Science of Monetary Policy: A New Keynesian Perspective. *Journal of Economic Literature*: 1661-1707.

Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). The Global Findex Database 2017: Measuring financial inclusion and the Fintech revolution.

Demirguc-Kunt, A., and Maksimovic, R . (2007). Finance and inequality: Theory and evidence. Annual Review of Financial Economics, 287-318.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. Journal of the American Statistical Association, 74, 427-431.

European Investment Bank. (2020). Banking in Africa: Financing transformation amid uncertainty. In The Oxford Handbook of Banking, 2nd Ed.

Engle, R. F., & Granger, C. W. J. (1987). Co-integration and error correction: Representation, estimation and testing.

Evans O. (2016). The effectiveness of monetary policy in Africa: modeling the impact of financial inclusion Iranian Economic Review. p. 327-337.

Khan, H.(2011). Financial inclusion and financial stability: are they two sides of the same coin. Address by Shri HR Khan, Deputy Governor of the Reserve Bank of India.

Johansen, S. (1988).Statistical analysis of co-integration vectors.Journal of Economic Dynamics and Control.

Lenka S.K. and Bairwa A.K.(2016). Does financial inclusion affect monetary policy in SAARC countries? Cogent Economics and Finance.

Mishkin, F.S.(2007). The economics of money, banking, and financial markets Pearson education.

Mehrotra, A., &Yetman, J. (2014).Financial inclusion and optimal monetary policy. BIS Working Papers, 1-25.

Mehrotra, A., &Yetman, J. (2015). Financial inclusion- issues for central banks. BIS Quarterly Review, 83-96

Mishkin F.S. (1995). Symposium on the monetary transmission mechanism. Journal of Economic perspectives: p. 3-10.

M.J. R García, M. Jos´e, Can financial inclusion and financial stability go hand in hand, Econ, Issues 21 (2016) 81–103

Mohan, Rakesh. (2006). Economic Growth, Financial Deepening and Financial Inclusion, Address at the Annual Bankers' Conference 2006, Hyderabad on November 3. Available online: http://rbidocs.rbi.org.in/rdocs/ Speeches/PDFs/73697.pdf.

Sarma, M. (2008).Index of financial inclusion.Indian Council for Research on International Economics Relations.

Triki, T. and Faye, I. (2013).Financial Inclusion in Africa. African Development Bank Research

Department.

Sherrif, M. (2016).The Relationship Between Financial Inclusion and Monetary Policy Transmission: The Case of Egypt. IISES International Academic Conference,

Stock, J. H., & Watson, M. W. (1993). A simple estimator of co-integrating vectors in higher order integrated systems. Econometrics, 61, 783-82

Saikkonen, P. (1992). Estimation and testing of co-integrated systems by an autoregressive approximation. Econometric Theory, 8(1), 1-27

WorkinehAyenewMossie (2022). Understanding financial inclusion in Ethiopia, Cogent Economics & Finance, 10:1, DOI: 10.1080/23322039.2022.2071385
World bank. (2017). The Global Findex Database 2017. Washington DC.

World Bank.(2014). World Development Report. Washington, D.C: World Bank

Yorulmaz, R. (2012). Financial Inclusion and Economic Development: A Case Study of Turkey and a Cross-Country Analysis of European Union. Clemson, SC: Clemson University