BRIDGING THE DIVIDE: THE IMPACT OF FINANCIAL INCLUSION ON INCOME INEQUALITY IN AFRICA

By

Kholeka Mdingi

Submitted in accordance with the requirements for the degree of

DOCTOR OF PHILOSOPHY

in the subject

ECONOMICS

at the

University of South Africa

Supervisor: Prof Sin-Yu Ho

October 2025

DECLARATION

Name: Kholeka Mdingi

Student number: 49361236

Degree: Doctor of Philosophy in Economics

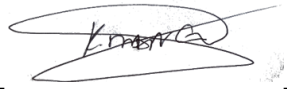
Exact wording of the title of the thesis as appearing on the electronic copy submitted for examination:

BRIDGING THE DIVIDE: THE IMPACT OF FINANCIAL INCLUSION ON INCOME INEQUALITY IN AFRICA

I declare that the above thesis is my own work and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I submitted the thesis to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at UNISA for another qualification or at any other higher education institution.



__ _____ __20 November 2025___

SIGNATURE DATE

ABSTRACT

The study empirically investigates the impact of financial inclusion on income inequality across 25 African countries from 2006 to 2022. Promoting financial inclusion has become a core strategy for economic development in emerging economies, focusing on advancing access for low-income households and small businesses. The existing literature suggests that such efforts yield various benefits for economic and financial development, which, in turn, may reduce income inequality. This potential link raises an important question: Does the movement toward greater financial inclusion effectively reduce income inequality? Empirical research examining the link between financial inclusion and income inequality is important, particularly in Africa, a developing region with high income inequality. Therefore, this study investigates the effect of financial inclusion – measured by access, penetration and usage dimensions and an overall index – on income inequality using the two-step system Generalised Method of Moments (GMM), and the Quantile Regression testing techniques. The findings indicate that access to financial services and products, their penetration, and the financial inclusion index reduce income inequality, particularly in countries at medium to high quantiles of the income inequality distribution, while it increases it at lower quantiles. Policy makers should implement policies that expand access to and penetration of formal financial services and products, and complement financial inclusion efforts with measures to reduce wealth gaps. In contrast, the findings show that the use of financial services and products increases income inequality, particularly in countries at medium to high quantiles of the income inequality distribution, while reducing it at lower quantiles. This suggests that financial use, in terms of credit and savings, tends to widen rather than reduce income inequality, benefitting those already financially included, while disadvantaged groups remain excluded. Policymakers should implement policies that promote income-generating activities and improve the earning capacity of disadvantaged populations before promoting this form of financial use. They should also promote more accessible alternative forms of financial use, such as digital payment systems and internet banking, to reduce barriers for small businesses and low-income groups. Furthermore, policymakers should pursue financial education initiatives to enable poor people to use these digital financial services and products effectively.

Key Terms: Africa; Financial inclusion; Income inequality; two-step system GMM, Quantile regression; Non-linear, inverted-U-shape relationship

ISISHWANKATHELO

Kwenziwe uphando ngokwamava xa kuphandwa impembelelo yokufikelela okuqukayo emalini kumba wokungalingani kwemivuzo kumazwe angama-25 elizwekazi iAfrika ukususela kunyaka wama-2006 ukuya kuthi ga kowama-2022. Ukuqhubela phambili ukufikelela okuqukayo emalini sisicwangciso esingundoqo sophuhliso loqoqosho lwamazwe anoqoqosho olusakhasayo kwaye sijolise ekubeni siphucule ukufikelela kwamakhaya anemivuzo emincinane kunye namashishini amancinane. Uncwadi olukhoyo lubalula ukuba iinzame ezilolu hlobo zinceda ngeendlela ezahlukeneyo kuphuhliso loqoqosho nolwemali, kwaye oku kunokuwucutha umsantsa wokungalingani kwemivuzo. Olu nxulumano olunokwenzeka luvusa umbuzo obalulekileyo: Ingaba ukufikelela okuqukayo emalini kuyawucutha ngokwenene na umsantsa wokungalingani kwemivuzo? Lubalulekile uphando ngokwamava oluhlola unxulumano phakathi kokufikelela okuqukayo emalini kunye nomsantsa wokungalingani kwemivuzo, ingakumbi kwilizwekazi iAfrika eliyingingqi esakhasayo enowona msantsa mkhulu wokungalingani kwemivuzo. Olu phando luphengulula isiphumo sokufikelela okuqukayo emalini – silinganiswa ngemilinganiselo yokufikeleleka, eyokungena neyokusetyenziswa nangesalathisi ngokubanzi – kumsantsa wokungalingani kwemivuzo lusebenzisa inkqubo emanyathelo amabini iGeneralised Method of Moments (GMM), kunye neendlela zokuhlola iQuantile Regression. Iziphumo zobonise ukuba ukufikelela kwiinkonzo nakwiimveliso zemali, ukungena kuzo kunye nesalathisi sokufikelela okuqukayo emalini ngokubanzi kuyawucutha umsantsa wokungalingani kwemivuzo, ingakumbi kumazwe akumanqanaba aphakathi ukusa kwaphezulu okungalingani kwemivuzo, ukanti kuyawunyusa kumazwe akumanqanaba asezantsi. Kufuneka abaqulunqi bemigaqo-nkqubo bamilisele imigaqo-nkqubo eyandisa ukufikeleleka nokungena kwiinkonzo neemveliso zemali ezisesikweni kwaye bawunciphise umsantsa wobutyebi besebenzisa ukufikelela okuqukayo emalini. Iziphumo zichasene noku kuba zona zibonisa ukuba ukusebenzisa iinkonzo neemveliso zemali kuyakwandisa ukungalingani kwemivuzo, ingakumbi kumazwe akumanqanaba aphakathi naphezulu ngokwemivuzo engalinganiyo, ukanti kumazwe akumanqanaba asezantsi okungalingani kwemivuzo oku kuyakunciphisa ukungalingani kwemivuzo. Oku kuxela ukuba ukusebenzisa imali ngamatyala nangokulondoloza imali kuyakwandisa ukungalingani kwemivuzo endaweni yokokuba kukunciphise kwaye kunceda abo asele bequkiwe emalini lo gama beqhubeka nokusala ngaphandle abo bangathathi ntweni. Phambi kokuba abaqulunqi bemigaqo-nkqubo baqhubele phambili olu hlobo lokusetyenziswa kwemali kufuneka bamilisele imigaqo-nkqubo

ekhuthaza ukwenziwa kwezinto ezingenisa umvuzo neziphucula ubuchule bokungenisa imali ebantwini abahlelelekileyo. Kufuneka baqhubele phambili iindlela ezizezinye ezifikelelekayo zokusebenzisa imali ezifana neenkqubo zokuhlawula ngedijithali nokubhanka ngeintanethi ukuze kuguzulwe imiqobo ethintela amashishini amancinane kunye nabantu abamkela imivuzo emincinane. Ngaphaya koko, kufuneka abaqulunqi bemigaqo-nkqubo benze amaphulo okufundisa ngemali ngelincedisa abantu abahlelelekileyo ukuze bakwazi ukusebenzisa ezi nkonzo neemveliso zemali zedijithali ngokukuko.

Amagama angundoqo: Afrika; Ukufikelela okuqukayo emalini; Ukungalingani ngokwemivuzo; inkqubo emanyathelo mabini iGMM, iQuantile regression; Ayikho mgceni, Ubudlelane buka-U oguqulweyo

OPSOMMING

Die studie ondersoek empiries die impak van finansiële insluiting op inkomste-ongelykheid in 25 Afrikalande van 2006 tot 2022. Die bevordering van finansiële insluiting het 'n kernstrategie vir ekonomiese ontwikkeling in ontluikende ekonomieë geword, met die fokus op die bevordering van toegang vir lae-inkomste huishoudings en klein besighede. Die bestaande literatuur dui daarop dat sulke pogings verskeie voordele vir ekonomiese en finansiële ontwikkeling inhou, wat weer inkomste-ongelykheid kan verminder. Hierdie potensiële skakel laat 'n belangrike vraag ontstaan: Verminder die beweging na groter finansiële insluiting inkomste-ongelykheid effektief? Empiriese navorsing wat die verband tussen finansiële insluiting en inkomste-ongelykheid ondersoek, is belangrik, veral in Afrika, 'n ontwikkelende streek met hoë inkomste-ongelykheid. Hierdie studie ondersoek dus die uitwerking van finansiële insluiting – gemeet aan toegang-, penetrasie- en gebruiksdimensies en 'n algehele indeks – op inkomste-ongelykheid met behulp van die tweestap-stelsel algemene metode van momente (AMM) en die kwantielregressie-toetstegnieke. Die bevindinge dui daarop dat toegang tot finansiële dienste en produkte, die penetrasie en die algehele finansiële insluitingsindeks inkomste-ongelykheid verminder, veral in lande met medium tot hoë kwantiele van die inkomste-ongelykheidsverspreiding, terwyl dit met laer kwantiele verhoog. Beleidsmakers behoort beleid te implementeer wat toegang tot en penetrasie van formele finansiële dienste en produkte uitbrei en finansiële insluitingspogings met maatreëls aanvul om welvaartgapings te verminder. In teenstelling hiermee toon die bevindinge dat die gebruik van finansiële dienste en produkte inkomste-ongelykheid verhoog, veral in lande met medium tot hoë kwantiele van die inkomste-ongelykheidsverspreiding, terwyl dit by laer kwantiele verminder. Dit dui daarop dat finansiële gebruik, in terme van krediet en spaargeld, geneig is om inkomste-ongelykheid te verbreed eerder as te verminder, wat diegene wat reeds finansieel ingesluit is, bevoordeel, terwyl benadeelde groepe uitgesluit bly. Beleidsmakers behoort beleid te implementeer wat inkomste-genererende aktiwiteite bevorder en die verdienvermoë van benadeelde bevolkings verbeter voordat hulle hierdie vorm van finansiële gebruik bevorder. Hulle behoort ook meer toeganklike alternatiewe vorme van finansiële gebruik, soos digitale betaalstelsels en internetbankdienste, te bevorder om versperrings vir klein besighede en lae-inkomstegroepe te verminder. Verder behoort beleidsmakers finansiële opvoedingsinisiatiewe na te streef om arm mense in staat te stel om hierdie digitale finansiële dienste en produkte effektief te gebruik.

Sleutelterme: Afrika; finansiële insluiting; inkomste-ongelykheid; AMM-tweestapstelsel; kwantielregressie; nie-lineêr, omgekeerde U-vormige verhouding

DEDICATION

To my beloved parents, Nozuko and Mlamli Mdingi, and my sisters, Nolubabalo and Nontsikelelo Mdingi.

ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to:

- My heavenly father, the almighty God, who has sustained me throughout my lifelong learning journey, and has granted me knowledge and understanding of the literature and its teachings. He has walked ahead of me and provided help every step of the way. The thesis stands as evidence of His faithfulness and love.
- To my supervisor and mentor, words cannot fully convey how thankful I am for her extraordinary dedication in guiding me. Her insightful advice, attention to detail, and well-rounded knowledge have been invaluable.
- To my husband, Moye Malatji, my IT technician. I feel truly blessed to have you by my side. Thank you for your unwavering support, love, and insightful advice.
- To my beloved children, Jane and Thabang Malatji, thank you for your unwavering love, patience, and understanding throughout this journey. Your smiles, and the joy you bring to my life have been a constant source of strength and motivation.
- To my parents and sisters, for their steadfast prayers, love and support throughout my educational journey.
- To Dr Parfait Beri for his selflessness, well-rounded knowledge and profound counsel, which have greatly guided me throughout my thesis.
- To my employer, UNISA, for providing study leave and financial support towards my studies.
- To Mrs Lineo Sekokoi, for her unwavering love, prayers and support.
- To Ms Jane Franz, for the exceptional editing of my thesis.
- To all my family and friends for their continuous prayers, love and support.

May God bless all the individuals and institutions mentioned above. They made my study possible. I take full responsibility for all the views presented in this study, as well as any shortcomings and omissions that may be found.

TABLE OF CONTENTS

DECLARATION 2
ABSTRACT 3
DEDICATION 8
ACKNOWLEDGEMENTS 9
TABLE OF CONTENTS 10
LIST OF TABLES 15
LIST OF FIGURES 17
LIST OF ACRONYMS 18
CHAPTER 1 20
INTRODUCTION AND BACKGROUND OF THE STUDY 20
1.1 Background of the Study 20
1.2 Problem Statement 22
1.3 Objectives of the Study 25
1.4 Hypotheses 25
1.5 The Significance and Contribution of the Study 26
1.6 Delimitations of the Study 28
1.7 Outline of the Study 29
CHAPTER 2 30
FINANCIAL INCLUSION IN AFRICA 30
2.1 Introduction 30
2.2 The Composition of the Banking System in Africa 30
2.3 International and National Strategies for Financial Inclusion 35
2.3.1 International Financial Inclusion Strategies 35
2.3.1.1 The World Bank's Strategies 37
2.3.1.2 Alliance for Financial Inclusion (AFI) Strategies 42
2.3.1.3 The Organisation for Economic Co-operation and Development (OECD) Strategies 47
2.3.2 Financial Inclusion Strategies in Africa 48
2.4 Financial Inclusion Trends: Comparison between International Regions and Africa 55
2.5 Barriers to Financial Inclusion Development in Africa 63

2.5.1 Demand-Side Barriers to Financial Inclusion 65
2.5.2 Supply-Side Barriers to Financial Inclusion 66
2.5.3 Socio-Political Barriers to Financial Inclusion 67
2.6 Conclusion 67
CHAPTER 3 70
INCOME INEQUALITY IN AFRICA 70
3.1 Introduction 70
3.2 International and National Strategies to Improve Income Distribution 71
3.2.1 International Initiatives to Improve Income Distribution 71
3.2.1.1 United Nations (UN) Strategy 71
3.2.1.2 The World Bank Strategy 73
3.2.2 National Initiative to Improve Income Distribution 74
3.3 Income Inequality Trends 81
3.3.1 Comparison of Income Inequality Trends Across International Regions 81
3.3.2 Comparison of Income Inequality Trends Within Africa 85
3.4 Conclusion 89
CHAPTER 4 92
REVIEW OF THEORETICAL AND EMPIRICAL LITERATURE 92
4.1 Introduction 92
4.2 Definition and Measurement of Financial Inclusion 92
4.2.1 Conceptualisation of Financial Inclusion 92
4.2.2 The Various Definitions of Financial Inclusion: Financial Inclusion Organisations 95
4.2.3 The Dimensions and Measurements of Financial Inclusion 97
4.3 Conceptual Definition of Income Inequality 105
4.3.1 Definition of Income Inequality 105
4.3.2 Dimensions of Income Inequality 105
4.3.3 Measures of Income Inequality 107
4.4 Theoretical Link Between Financial Inclusion and Income Inequality 109
4.4.1 Linear Relationship Between Financial Inclusion and Income Inequality 110
4.4.1.1 The Channel of Capital Accumulation 110
4.4.1.2 The Labour Market Channel 111

4.4.1.3 The Channel of Entrepreneurial Activities.....111
4.4.1.4 The Channel of Education.....112
4.4.2 Non-linear Relationship Between Financial Inclusion and Income Inequality.....112
4.4.2.1 Model of Greenwood and Jovanovic (1990) 113
4.4.2.2 Model of Aghion & Bolton (1997).....114
4.4.3 Summary of Theoretical Literature Review.....115
4.5 Financial Inclusion and Income Inequality: Empirical Review 116
4.5.1 Empirical Evidence from Developing Countries.....116
4.5.2 Empirical Evidence from Developed and Developing Countries 134
4.5.3 Summary of Empirical Literature Review 143
4.6 Gap in the Literature..... 144
4.7 Conclusion 145
CHAPTER 5..... 148
METHODOLOGY OF THE STUDY..... 148
5.1 Introduction..... 148
5.2 Description of Data and Variables..... 148
5.2.1 Availability of the Data and Ethical Considerations..... 148
5.2.2 Variable Definition and Justification 149
5.2.2.1 Dependent Variables – Income Inequality..... 149
5.2.2.2 Independent Variables – Financial Inclusion 150
5.2.2.3 Independent Variables – Control Variables..... 152
5.3 The General Empirical Model Specification 156
5.4 Construction of the Financial Inclusion Index..... 157
5.4.1 Construction of the Financial Inclusion Sub-Indices and the Overall Index..... 157
5.5 Preliminary Tests 160
5.5.1 Descriptive Statistics..... 160
5.5.2 Pairwise Correlation Analysis..... 160
5.5.3 Panel Unit Root Tests..... 160
5.5.4 Cross-Sectional Dependence Tests..... 163
5.6 Estimation Techniques..... 164

5.6.1 Linear Estimation of the Association Between Financial Inclusion and Income Inequality 164
5.6.1.1 System Generalised Method of Moments (GMM) Analysis of the Relationship Between Financial Inclusion and Income Inequality 164
5.6.1.2 Quantile Regression Analysis of the Relationship Between Financial Inclusion and Income Inequality 166
5.6.2 Non-Linear Analysis of the Relationship Between Financial Inclusion and Income Inequality 168
5.6.2.1 Inverted-U-shape Hypothesis Association Between Financial Inclusion and Income Inequality Using a Squared Term 168
5.7 Conclusion 170
CHAPTER 6 171
PRESENTATION OF RESULTS AND INTERPRETATION 171
6.1 Introduction 171
6.2 Constructing Financial Inclusion Indices 171
6.2.1 Pairwise Correlation for Financial Inclusion Proxies 172
6.2.2 Validity of the Financial Inclusion Indices 173
6.2.3 First Stage of PCA 174
6.2.4 Second Stage of PCA 175
6.3 Results for Descriptive Statistics and Pairwise Correlation 176
6.4 Diagnostic Test Results 179
6.4.1 Unit Root Tests 179
6.4.2 Cross-sectional Dependence Results 180
6.4.3 Time Fixed Effects Test Results 181
6.4.4 Heteroskedasticity Test Results 181
6.4.5 Multicollinearity Test Results 182
6.4.6 Serial Correlation (Autocorrelation) Test Results 183
6.5 Estimation Results and Discussion 183
6.5.1 Results on the Effect of Financial Inclusion on Income Inequality 183
6.5.1.1 Discussion of Financial Inclusion Access Results 184
6.5.1.2 Discussion of Financial Inclusion Penetration Results 186
6.5.1.3 Discussion of Financial Inclusion Usage Results 186

6.5.1.4 Discussion of Financial Inclusion Index Results 188
6.5.1.5 Summary of the Results 190
6.5.2 Impact of Financial Inclusion on Income Inequality Across Varying Levels of Income Inequality 191
6.5.2.1 Discussion of Financial Inclusion Access Results 192
6.5.2.2 Discussion of Financial Inclusion Penetration Results 194
6.5.2.3 Discussion of Financial Inclusion Usage Results 195
6.5.2.4 Discussion of Financial Inclusion Index Results 197
6.5.2.5 Summary of the Results 199
6.5.3 Non-linear Impact of Financial Inclusion on Income Inequality 199
6.6 Robustness Check Results 201
6.6.1 Alternative Measurement of Income Inequality 201
6.6.1.1 The Effect of Financial Inclusion on Income Inequality 201
6.6.2 Controlling for Institutional Factors: Property Rights 203
6.6.3 Non-linear Impact of Financial Inclusion on Income Inequality 204
6.7 Summary of the Results 205
6.8 Conclusion 208
CHAPTER 7 210
SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS 210
7.1 Introduction 210
7.2 Summary of the Study 210
7.3 Summary of the Empirical Results 213
7.4 Policy Recommendations 217
7.5 Limitations of the Study and Suggested Future Research Areas 220
Reference List 221
Appendices 255

LIST OF TABLES

Table 2. 1: Composition of the banking sector in Africa 31
Table 2. 2: Maya Declaration themes and sub-themes 43
Table 2. 3: Accords launched between 2013 and 2019 45
Table 2. 4: AFI National Financial Inclusion Strategies: Countries with NFIS and those in the formulating phase 47
Table 2. 5: Direct and indirect benefits of financial education 48
Table 2. 6: Summary of National Financial Inclusion Strategies in Selected African Countries . 51
Table 2. 7: African countries with National Financial Inclusion Strategies 255
Table 3. 1: Sustainable Development Goal 10 targets and indicators 72
Table 3. 2: National strategies to reduce income inequality 75
Table 4. 1: Multidimensional concept of financial inclusion: access, usage, cost, availability, penetration, quality 99
Table 4. 2: Set of indicators for financial inclusion 101
Table 4. 3: Summary of empirical studies on the effect of financial inclusion on income inequality in developing countries 122
Table 4. 4: Summary of empirical studies on the relationship between financial inclusion and income inequality in developed and developing countries 137
Table 5. 1: Control variables, proxies, justification, expected signs, and the sources of the variables 155
Table 5. 2: African countries' Gini coefficient by range based on the year 2022 256
Table 6. 1: Pairwise correlation matrix 172
Table 6. 2: KMO values 173
Table 6. 3: Principal components' estimates of financial inclusion access 174
Table 6. 4: Principal components' estimates of financial inclusion penetration 174
Table 6. 5: Principal components' estimates of financial inclusion usage 175
Table 6. 6: Principal components' estimates of the financial inclusion index 175
Table 6. 7: Descriptive statistics results 177
Table 6. 8: Correlation matrix for the sample 178
Table 6. 9: LLC and IPS unit root tests 179
Table 6. 10: Cross-sectional independence tests 181
Table 6. 11: Time fixed effects test results 181
Table 6. 12: Heteroskedasticity test results 182
Table 6. 13: Results for multicollinearity 182
Table 6. 14: Results for serial correlation 183
Table 6. 15: Financial inclusion and Gini coefficient 184
Table 6. 16: Financial inclusion access and Gini coefficient 193
Table 6. 17: Financial inclusion penetration and Gini coefficient 195
Table 6. 18: Financial inclusion usage and Gini coefficient 197
Table 6. 19: Financial inclusion index and Gini coefficient 198

Table 6. 20: The impact of the financial inclusion index on income inequality, conditional on the extent of financial inclusion 200
Table 6. 21: Financial inclusion and Palma ratio 202
Table 6. 22: The impact of financial inclusion on income inequality, accounting for institutional factors 204
Table 6. 23: The impact of the financial inclusion index on income inequality, conditional on the extent of financial inclusion 205
Table 6. 24: The list of African countries included in the study 256

LIST OF FIGURES

Figure 2. 1: Achieve Universal Access by 2020 Strategy 41
Figure 2. 2: Percentage of adults who own debit cards and percentage of commercial banks per 100,000 adults 57
Figure 2. 3: Number of ATMs per 100,000 adults 57
Figure 2. 4: Percentage of adults with accounts at financial institutions 58
Figure 2. 5: Percentage of adults with mobile money account 58
Figure 2. 6: Adults who used debit cards (%) 59
Figure 2. 7: Adults who deposited money with formal banks (%) 60
Figure 2. 8: Adults who saved money with a formal commercial bank (%) 60
Figure 2. 9: Adults who borrowed money from a formal financial institution (%) 61
Figure 2. 10: Percentage of adults with accounts at formal financial institutions in 2021 62
Figure 2. 11: Percentage of adults using savings to fund emergency expenses in 2021 63
Figure 2. 12: Barriers to financial inclusion 65
Figure 3. 1: Changes in the level of income inequality across the regions of the world over ten-year intervals from 1980 to 2019 82
Figure 3. 2: The level of income inequality across the regions of the world in 2022 83
Figure 3. 3: African countries that make up the top 20 countries with the highest income disparities in the world based on the Gini index in 2023 85
Figure 3. 4: Income disparities in Africa 88
Figure 3. 5: Income inequality across Africa: Comparison between all countries and the subset excluding the top 11 most unequal countries 88
Figure 3. 6: Subregional comparison of income inequality in Africa – ten-year intervals from 1980 to 2019 89
Figure 3. 7: Subregional comparison of income inequality in Africa for the year 2022 89
Figure 4. 1: Vulnerable groups, voluntary and involuntary exclusions 94

LIST OF ACRONYMS

MEANING	ACRONYM
African Financial Inclusion Policy Initiative	AFPI
Alliance for Financial Inclusion	AFI
Automated Teller Machines	ATMs
Congressional Budget Office	CBO
Consumer Price Index	CPI
Cross-Sectional Augmented Autoregressive Distributed Lag	CS-ARDL
Cross-sectional Dependence	CD
Denarau Action Plan	DAP
Eastern Europe and Central Asia	EECA
European Union	EU
Fixed Effect	FE
Fully Modified Ordinary Least Squares	FMOLS
Financial Inclusion Support Framework	FISF
Generalised Least Squares	GLS
Global Policy Forum	GPF
Global Partnership for Financial Inclusion	GPFI
Gross Domestic Product	GDP
Human Development Index	HDI
Im-Pesaran-Shin Test	IPS test
International Bank for Reconstruction and Development	IBRD
International Centre for Settlement of Investment Disputes	ICSID
International Development Association	IDA
International Finance Corporation	IFC
International Monetary Fund	IMF
Kaiser-Meyer-Olkin	KMO
Latin America and the Caribbean	LAC
Levin-Lin-Chu Test	LLC test
Micro, Small and Medium Enterprises	MSMEs
Middle East and North Africa	MENA
Multilateral Investment Guarantee Agency	MIGA
National Financial Inclusion Strategy	NFIS
Organisation for Economic Co-operation and Development	OECD
Organisation of Islamic Corporations	OIC
Ordinary Least Squares	OLS
Pacific	PAC
Principal Component Analysis	PCA
Return On Assets	ROA
Two-Stage Least Squares	2SLS
Small and Medium-sized Enterprises	SMEs
Structural Equation Modelling	SEM
Sub-Saharan African	SSA
Sustainable Development Goals	SDGs

System Generalised Method of Moments	System GMM
United Nations Economic Commission for Africa	UNECA
Universal Financial Access	UFA
United Nations	UN
United Nations Development Programme	UNDP

CHAPTER 1
INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Background of the Study

Income inequality remains one of the most pressing global economic challenges, reflecting deep disparities in income distribution that undermine inclusive growth and social stability. As it stands, based on 2021 statistics, globally, the top 10 percent captures 50 percent of total income, while the bottom 50 percent captures 8.5 percent (World Inequality Report, 2022c). This uneven distribution is driven by factors such as skill-biased technological progress, the growing significance of capital incomes, and shifts in taxation and transfer policies (Verma & Giri, 2022). Such inequality is a cause for concern, as it generates inefficiencies and social distortions, including rent-seeking and bribery (Todaro & Smith, 2012). Furthermore, it discourages investment in human capital (Galor & Zeira, 1993), weakens aggregate demand (Carvalho & Rezai, 2014; Cynamon & Fazzari, 2013), limits intergenerational mobility (Aslan, Deléchat, Newiak, & Yang, 2017; Corak, 2013), and contributes to economic and political instability (Dabla-Norris, Kochhar, Suphaphiphat, Ricka, & Evridiki, 2015; Ostry, Berg & Tsangarides, 2014).

This challenge is particularly acute in Africa, where the divide is widening. Since 2020, the average income of the richest 1 percent in Africa has grown five times faster than that of the bottom 50 percent, indicating that economic growth has disproportionately favoured the wealthiest (Kamande & Hallum, 2025). In addition, 11 of the top 20 countries with the most significant income disparities, as measured by the Gini index, were located on the continent in 2023 (Statista, 2024c). This trend is reinforced by Kamande and Hallum (2025), who observed that nearly half of the world's 50 most unequal countries are African. Moreover, the continent also experiences substantial subregional disparities, with extreme income inequality in Southern Africa, followed by Central, West, and East Africa, while Northern Africa exhibits comparatively lower levels (World Inequality Database, 2024). These subregional variations are largely rooted in historical legacies, such as settler colonialism in Southern Africa, which created deeply entrenched structural inequalities, in contrast to lower settler presence in other subregions (Nel, 2018). Beyond these historical factors, contemporary inequality persists due to concentrated wealth, governance and institutional constraints that limit fiscal capacity for redistribution (Bhorat, Naidoo, & Pillay,

2016), a lack of economic transformation (Nissanke & Thorbecke, 2007), and insufficient industrialisation (Yeboua, 2024).

Consequently, income inequality has become a central focus for international and regional organisations, as it derails economic progress by constraining the equitable use of resources and diminishing the impact of growth on poverty reduction (Alesina & Perotti, 1996; Batuo, Kararach & Malki, 2021; Persson & Tabellini, 1994). A key strategy for addressing this issue is to provide the poorest and low-income earners with opportunities to invest in their physical and human capital. In this context, financial inclusion is widely recognised as an important tool for achieving this goal (World Bank, 2013g) and is considered essential for meeting the United Nations' Sustainable Development Goals, particularly SDG 10, which focuses on reducing inequality (Demir, Pesqué-Cela, Altunbaş, & Murinde, 2022). Financial inclusion is defined as the easy access to, availability of, and utilisation of formal financial services by previously excluded businesses and individuals (Amidžić, Massara & Mialou, 2014; Sahay et al., 2015; Sarma, 2008; Ozili, 2018, Ozili, 2020). It entails providing affordable, convenient, and tailored financial services to disadvantaged and low-income groups (African Development Bank, 2013; Alliance for Financial Inclusion (AFI), 2010; Consultative Group to Assist the Poor (CGAP), 2011, CGAP, 2025; Dev, 2006). The theoretical foundation for its impact on income inequality rests on the premise that as the financial system grows and becomes more inclusive, it increases economic opportunities for the poorest and underserved, enabling them to invest in human and physical capital, thereby reducing income disparities (Aghion, Howitt, & Mayer-Foulkes, 2005; Beck, Demirgüç-Kunt & Levine, 2004; Dollar & Kraay, 2002).

In response, governments and international organisations are developing specific policy frameworks to encourage it (Khan, Khan, Sayal & Khan, 2022; Ozili, 2020). For example, the World Bank Group's Financial Inclusion Support Framework (FISF) aims to advance country-led reforms. In Africa, this effort is complemented by the African Financial Inclusion Policy Initiative (AFPI), which supports the development of policies and regulatory frameworks (AFI, 2024c; World Bank Group, 2022a). The rationale behind these policies is that an inclusive financial system can facilitate a fairer distribution of income. Financial exclusion, stemming from a lack of income and market imperfections like information asymmetries and transaction costs, can create poverty

traps and contribute to an unequal society (Park & Mercado, 2016). In contrast, greater financial inclusion enhances access to and use of formal financial services for the unbanked, creating income-generating opportunities, stimulating job creation, and promoting economic stability, all of which can help reduce income inequality (Khan & Khan, 2023; Menyelim, Babajide, Omankhanlen, & Ehikioya, 2021).

Despite the strong theoretical basis and policy emphasis on financial inclusion as a tool for reducing income inequality, empirical evidence on the effectiveness of this relationship in the African context remains inconclusive and fragmented. Given the continent's unique historical, structural, and subregional inequalities, this potential link raises a critical question: Does the movement toward greater financial inclusion effectively reduce income inequality in Africa? This pivotal question motivates the current study.

1.2 Problem Statement

The significance of inclusive economic growth, in which all segments of a population benefit, is increasingly recognised worldwide (Kebede, Naranpanawa, & Selvanathan, 2023). To achieve this, policymakers must design and implement policies that reduce income inequality. The literature identifies various mechanisms for addressing income inequality, including redistributive policies, such as taxes and transfers (Clements, de Mooij, Gupta & Keen, 2015), and labour market interventions, such as minimum wage policies (Volscho, 2005). More recently, financial inclusion has emerged as a key policy tool to address this issue, with the literature arguing that it improves access to and use of financial services among low-income and marginalised groups (Demirgüç-Kunt & Klapper, 2013; World Bank, 2013g; World Bank, 2018; Omar & Inaba, 2020). However, financial inclusion is not a monolithic concept; it is fundamentally multidimensional, encompassing access, availability, penetration, usage, cost and quality. However, due to the availability of data in the region of interest, the study only considered access, penetration and usage dimensions. Financial access refers to the availability and ease of reaching formal financial services, free from monetary or non-monetary barriers, with services supplied at appropriate quality and cost (AFI, 2013; Amidžić et al., 2014; Arora, 2010; Beck, Demirgüç-Kunt & Martinez-Peria, 2007). Penetration reflects the extent to which available financial services reach a broad cross-section of society (Sarma, 2008). Usage captures the actual, active utilisation of these

services, which is critical for realising welfare benefits (AFI, 2019d; Demirgüç-Kunt & Klapper, 2013). Distinguishing between these dimensions is essential, as access alone does not guarantee active use (African Development Bank, 2013). This distinction carries significant weight in the African context, where, despite some progress, over 50 percent of the population remains financially excluded, making it the lowest-ranked region globally in terms of account ownership and ATM access (World Bank, 2024a).

A substantial body of literature suggests that financial inclusion can lead to a more equitable distribution of income. However, empirical evidence remains inconclusive, revealing a lack of consensus that warrants further investigation. Studies have reported negative effects (Omar & Inaba, 2020; Zhang & Posso, 2019), positive effects (Dimova & Adebowale, 2018; Tita & Aziakpono, 2017; Turégano & García-Herrero, 2015), and even no significant association (Agyemang-Badu, Agyei & Duah, 2018; Park & Mercado, 2018; Sawadogo & Semedo, 2021). These mixed findings suggest that the relationship is not straightforward and may be contingent on contextual factors, methodological choices, and the specific dimensions of financial inclusion under consideration. The African region provides a uniquely compelling setting for examining this relationship. While Africa has demonstrated economic resilience, growing by 3.4 percent in 2022 (United Nations Economic Commission for Africa, 2024a), this growth has not been pro-poor. Africa is characterised by high income inequality. The urgency of addressing this issue is underscored by the African Union, which has acknowledged that extreme inequality threatens the achievement of Agenda 2063 and, in 2024, set a target to reduce inequality by 15 percent over the next decade (Kamande & Hallum, 2025). Given this context, empirical research that rigorously examines the impact of financial inclusion on income inequality in Africa is both timely and critical.

Several key gaps have been identified in the existing literature that this study seeks to address: First, and most critically for this study, existing research predominantly relies on either single indicators or composite indices of financial inclusion, with little effort to jointly examine both the individual dimensions (access, penetration, usage) and an overall composite index. This presents a fundamental problem, as using isolated proxies may fail to capture the multidimensional nature of financial inclusion, potentially masking important nuances in how different aspects of inclusion

affect income inequality. Conversely, relying solely on a composite index obscures which specific dimension, whether expanding access, deepening penetration, or promoting active usage, drives the observed effect. This distinction is not merely academic; it has direct implications for methodology and policy implementation. Methodologically, a failure to disaggregate these dimensions risks incomplete findings. From a policy perspective, understanding whether access, penetration, or usage matters most is essential for designing targeted, effective interventions. For instance, policies aimed at reducing income inequality may require different strategies if the binding constraint is limited access to financial infrastructure rather than low rates of active usage among those who already have accounts.

Second, research on the differential effect of financial inclusion on income inequality across varying levels of income inequality remains ambiguous. It is unresolved whether financial inclusion benefits all countries equally or whether its effectiveness depends on the severity of existing inequality. Specifically, using single variables, Demir et al. (2022) found that financial inclusion reduces income inequality across all income quantiles, whereas another study found that financial inclusion (index) reduces income inequality in countries with relatively low levels of income inequality (see Md Jamil, Law, Khair-Afham, & Trinugroho, 2024). Sukmana and Ibrahim (2018), using a financial access indicator constructed by Honohan (2008), indicate that financial access reduces income inequality in countries with relatively low levels of income inequality. In the context of Africa, we found only one study which covered 23 countries during the period 2004 to 2018 using two dimensions and an overall index (see Kebede et al., 2023). Investigating this relationship is particularly pertinent to Africa, given the continent's significant subregional disparities, from extreme inequality in Southern Africa (Gini coefficient of 75) to comparatively lower levels in Northern Africa (Gini coefficient close to 60) (World Inequality Database, 2024).

Third, the potential for a non-linear impact, in which the effect of financial inclusion on income inequality varies across different levels of inclusion, has received minimal attention. While the theoretical foundation for such a relationship was established by Greenwood and Jovanovic (1990), few empirical studies have explored it in the African context (see Fouejieu, Sahay, Čihák & Chen, 2020; Segning, Djiogap, Piabuo & Noupie, 2023). This gap is significant because the benefits of financial inclusion may not be uniform.

Therefore, this study seeks to address these critical and interconnected gaps. It aims to comprehensively examine the effect of financial inclusion on income inequality in 25 African countries[1] by: (1) employing a multi-dimensional approach that jointly analyses the individual dimensions (access, penetration, and usage) alongside a composite index of financial inclusion; (2) exploring the differential effects across varying levels of income inequality; and (3) investigating the potential non-linear relationship. This comprehensive framework is designed to generate nuanced empirical evidence that can inform more precise and effective policy interventions to reduce income inequality across Africa's diverse landscape.

1.3 Objectives of the Study

This research aims to provide a comprehensive understanding of the relationship between finance and income inequality in Africa. The main objective of the study is to investigate the impact of financial inclusion on income inequality in a panel of 25 African countries from 2006 to 2022. The analysis will be guided by the following specific objectives:

- To examine the impact of financial access on income inequality in Africa.
- To examine the impact of financial penetration on income inequality in Africa.
- To examine the impact of financial usage on income inequality in Africa.
- To examine the effect of the composite index of financial inclusion on income inequality in Africa.
- To examine whether the impact of financial inclusion on income inequality is different across countries, contingent upon the varying levels of income inequality.
- To examine whether financial inclusion has a non-linear, inverted-U-shaped effect on income inequality across African countries.

1.4 Hypotheses

Guided by the specific research objectives and the theoretical framework, the study empirically tests the following hypotheses:

[1] The 25 developing countries in Africa under investigation are Algeria, Botswana, Burundi, Cameroon, Congo Republic, Egypt, Eswatini, Gambia The, Ghana, Guinea, Kenya, Lesotho, Madagascar, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Rwanda, Seychelles, South Africa, Tanzania, Uganda, Zambia and Zimbabwe. The number of countries is dictated by the availability of data.

i) Financial access has a negative impact on income inequality.

ii) Financial penetration has a negative impact on income inequality.

iii) Financial usage has a negative impact on income inequality.

iv) The financial inclusion index has a negative effect on income inequality.

v) The negative effect of financial inclusion on income inequality is conditional on the initial level of income inequality, with a stronger effect observed in countries with high inequality.

vi) There is a non-linear, inverted-U-shaped relationship between financial inclusion and income inequality.

1.5 The Significance and Contribution of the Study

By analysing the impact of financial inclusion on income inequality in Africa, this study enriches the body of literature in several ways. First, the study contributes by employing the novel sub-indices (i.e., access, penetration and usage) and the overall index, which captures the multidimensional concept of financial inclusion. Existing empirical studies often rely on individual proxy variables that represent specific dimensions (see Ashenafi & Yan, 2023; Chinoda & Mashamba, 2021; Turégano & García-Herrero, 2018), an approach that neglects the comprehensive effect of aggregated sub-indices and fails to capture the multifaceted and complex nature of financial inclusion. While some studies have developed an overall index, they frequently employ individual variables (see Chinnakum, 2023; Le et al., 2019; Park & Mercado, 2015) or combined dimensions such as outreach and usage in the African context (see Kebede et al., 2023), access, usage and quality in the case of the Middle East and North Africa (MENA) region (see Seifelyazal, Salaheldin & Assem, 2023), or apply equal weighting to combine usage, availability, penetration and financial activity index in the sub-Saharan African (SSA) context (see Segning et al., 2023). To address this gap, this study constructs rigorous sub-indices and aggregates them into an overall index using Principal Component Analysis (PCA) over the period 2006 to 2022, grounded in the established definitions of global institutions such as the World Bank (2014), World Bank Group (2025a), the AFI (2010) and the Organisation for Economic Co-operation and Development (OECD) (2013). Analysing the sub-indices allows us to capture the effect of access, penetration and usage on income inequality. Simultaneously, the overall index captures the net effect of financial inclusion as a multidimensional concept. This dual approach provides a more nuanced understanding, which is crucial for designing effective and targeted policy interventions

(Seifelyazal et al., 2023). By employing different dimensions of financial inclusion, access, penetration and usage, and an overall index, the study provides more targeted insights into which aspects are most effective in reducing income inequality. This enables policymakers to design more precise and evidence-based interventions rather than adopting a one-size-fits-all approach.

Second, this study advances the literature by investigating the conditional effect of financial inclusion on income inequality and testing whether this impact varies across countries with different levels of income inequality. This investigation is motivated by significant disparities in inequality across African subregions, with the Southern subregion exhibiting higher income inequality than the Northern subregion (World Inequality Database, 2024), and by the ambiguous findings in existing literature. Using single variables, Demir et al. (2022) found that financial inclusion decreases income inequality across all income quantiles. Another study, however, showed that the financial inclusion index reduces income inequality in countries with relatively low income inequality levels (see Md Jamil et al., 2024). Sukmana and Ibrahim (2018), using a financial access indicator constructed by Honohan (2008), also found that financial access lowers income inequality in countries with low inequality. In Africa, only one study, covering 23 countries from 2004 to 2018, examined this issue using two dimensions and an overall index (see Kebede et al., 2023). This study addresses this gap by investigating the conditional effect of financial inclusion on income inequality across varying levels of income inequality using three sub-indices and an overall index in 25 African countries. This approach is crucial, as the relationship between financial inclusion and income inequality might not always be uniformly negative or positive across varying levels of income inequality. The effectiveness of financial inclusion in reducing income disparities within and across countries may depend on a country's initial level of income inequality. The analysis of conditional effects highlights that the impact of financial inclusion may not be uniform across countries. This suggests that policy strategies should be tailored according to a country's existing level of income inequality. For instance, countries with high income inequality may require different financial inclusion policies compared to countries with relatively lower inequality levels.

Third, this study contributes to the empirical model by exploring a non-linear, inverted-U-shaped relationship between financial inclusion and income inequality. This hypothesis is informed by the

proposition that the movement of inequality is not linear along the development path (Townsend & Ueda, 2006). It is also informed by the theoretical framework of Greenwood and Jovanovic (1990), which suggests an inverted-U-shaped relationship between the development of the financial system and income inequality. While this non-linearity has been analysed in the context of financial development (see Clarke, Xu & Zou, 2003; Clarke et al., 2006; Kapingura, 2017; Rehman, Khan & Ahmad, 2008), research from a financial inclusion perspective remains limited. Notable exceptions include studies by Fouejieu et al. (2020), which looked at a sample of both developed and developing countries, and Segning et al. (2023), which focused on SSA. This study distinctively tests the Greenwood-Jovanovic hypothesis using a comprehensive multidimensional index in Africa. Investigating this non-linear pathway helps identify whether financial inclusion worsens or mitigates income inequality during Africa's development path. By examining the potential non-linear relationship between financial inclusion and income inequality, the study offers critical insights into the stages at which financial inclusion may either exacerbate or reduce income inequality. This is particularly important for long-term policy planning, as it indicates that financial inclusion initiatives must be carefully designed and complemented with supportive policies to ensure inclusive and equitable economic development.

1.6 Delimitations of the Study

This study is delimited to an analysis of the relationship between financial inclusion and income inequality in Africa. The empirical investigation focuses on the period 2006 to 2022, selected based on the availability of data across countries. Only countries with sufficient data for the variables of interest are included in the sample. Financial inclusion is examined as a multidimensional concept, specifically through the dimensions of access, penetration, and usage, as well as a composite index. Aspects of financial development are excluded to maintain a clear focus on inclusion rather than the broader financial system. In addition, the study employs a quantitative approach using panel data techniques to estimate the relationship between financial inclusion and income inequality. Macroeconomic control variables are included selectively based on theoretical relevance and data availability, while other potential determinants of income inequality are not incorporated in order to preserve model parsimony.

1.7 Outline of the Study

This study is organised into seven chapters. Chapter one presents the introduction of the study. Chapters two and three discuss financial inclusion and income inequality, focusing on both international and national strategies of financial inclusion and income inequality, as well as current trends. Chapter four reviews the existing theoretical and empirical literature. Chapter five outlines the model specifications and testing techniques used to investigate the impact of financial inclusion on income inequality. The sixth chapter interprets and discusses the findings of the study. Lastly, Chapter seven summarises the key findings of the study and offers policy recommendations.

CHAPTER 2

FINANCIAL INCLUSION IN AFRICA

2.1 Introduction

This chapter delves into region-specific literature on financial inclusion in Africa, offering a comprehensive analysis of this concept. The chapter includes six sections. After the introduction, section 2.2 discusses the composition of Africa's banking system, providing a foundation for understanding its structural dynamics across the region. Section 2.3 then provides both international and national initiatives to improve financial inclusion. This section is divided into two subsections: section 2.3.1 discusses international strategies, while section 2.3.2 discusses strategies in Africa, with particular emphasis on the countries chosen for this study. Following this, sections 2.4 and 2.5 explore financial inclusion trends and barriers in Africa, shedding light on the progress made and the challenges that persist. Finally, section 2.6 concludes the chapter by summarising key insights.

2.2 The Composition of the Banking System in Africa

Africa is a continent that consists of 54 countries, characterised by economic and cultural diversity. The financial system, particularly banking, is based on countries characterised by diverse economic outlooks. Reviewing such a heterogeneous group of economies may pose a challenge. Therefore, the countries are categorised based on their geographic lines, namely, North Africa, West Africa, East Africa, Central (Middle) Africa, and Southern Africa, to make the review more concise (African Development Bank, 2013; Allen, Otchere & Senbet, 2011). The African banking sector comprises central banks and deposit-taking institutions. The central banks are not controlled by the government, but they work closely with the Ministries of Finance in their respective countries to develop and implement macroeconomic policies. Deposit-taking institutions consist of domestic and foreign branches or subsidiaries such as commercial banks, mutual banks, and cooperative banks (Beck, Maimbo, Faye & Triki, 2011). Table 2.1 below provides a summary of the banking landscape in Africa[2] based on data sourced from the central banks of each country. As shown in the table, there are a total of 809 commercial banks operating across Africa. Of these,

[2] Three countries, Cote d'Ivoire, Sudan and Tunisia, are excluded due to the inability to access the list of banks.

275 are domestically owned private banks, 81 are state-owned banks, and 429 are foreign-owned banks, which constitute the largest share. At the same time, the region has only 5 mutual banks and 19 cooperative banks, highlighting the limited presence of these types of financial institutions.

Table 2. 1: Composition of the banking sector in Africa

	Africa	**Southern Africa**	**East Africa**	**West Africa**	**Central Africa**	**North Africa**
Number of registered commercial banks	809	177	223	223	71	115
Number of domestic privately owned banks	275	59	105	60	13	38
Number of state-owned banks	81	18	19	13	6	25
Number of foreign banks	429	90	94	150	52	43
Number of mutual banks	5	5	0	0	0	0
Number of cooperative banks	19	5	5	0	0	9

Source: Author's compilation based on information from central banks in African countries

The banking system in Africa has experienced significant transformation over the past 30 years. Until the 1980s, the continent was primarily dominated by government-owned banks and faced restrictive regulations, such as interest rate ceilings and credit quotas. However, financial liberalisation, along with upgrades to institutions and regulations, has reshaped the financial landscape throughout the region (Beck, Cull, Mare & Valenzuela, 2023). There has been an extensive privatisation of state-owned banks, mostly to foreign-owned banks, which shows one aspect of potential growth in internationalisation and regionalisation (Honohan & Beck, 2007). According to Beck, Cull, and Valenzuela (2019) and Beck et al. (2023), foreign-owned banks have gained significant importance in recent years, while the dominance of government-owned banks

has decreased. The percentage of assets owned by foreign-owned banks rose from 35 percent in 1995 to over 65 percent in 2019. In contrast, the average share of assets held by government-owned banks declined from 17 percent in 1995 to only 5 percent in 2019. Table 2.1 shows that banks in Africa are mostly comprised of 429 foreign-owned banks.

Foreign-owned banks have been present in Africa since the colonial era, but their participation increased significantly during the privatisation wave of the 1980s and 1990s, along with the financial sector reforms of the 1990s and early 2000s. Traditionally, these foreign banks primarily came from Europe. However, in recent years, banks based in Africa have begun to expand into other African countries on a large scale. After the end of Apartheid, several South African banks, particularly Standard Bank and ABSA, started to expand across the continent. Following this, two West African banks – Ecobank and Bank of Africa – also began to broaden their reach throughout sub-Saharan Africa. Additionally, Moroccan banks started to move southward. As a result of bank consolidation waves in Nigeria and Kenya, financial institutions from these countries have also begun to expand into other areas of the continent (Beck & Cull, 2014; Beck et al., 2023).

Despite the liberalisation of the African financial system, it remained shallow and less inclusive. The system has been proven to be shallow based on the three standard indicators of financial development, which are liquid liabilities to GDP, bank deposits to GDP, and private credit to GDP (Beck et al., 2023). In their study, Beck et al. (2023:7) analysed data from the years 2011 and 2021 and reported that "*while the median non-African developing country had liquid liabilities of 65% of GDP in 2021, the median African country had only 31%. Moreover, the median liquid liabilities to GDP ratio increased by 16 percentage points from 2011 to 2021 for non-African developing countries, compared to a five-percentage point gain for African countries. Similarly, the median deposit to GDP ratio outside Africa was 58% in 2021 (a thirteen-percentage point increase since 2011), compared to 25% in Africa (a five-percentage point gain since 2011); the median Private Credit to GDP ratio was 48% outside Africa (rising from 31% in 2011), but only 15.5% inside Africa (rising from 14% in 2011). Comparing the difference between deposit and credit ratios also indicates that African banks are less effective in intermediating society's savings than banks in non-African developing countries.*"

On the other hand, the African financial system is less inclusive because the majority of the population in Africa remains excluded. Figures 2.2, 2.3 and 2.4 in section 2.4 below present indicators of access, usage and penetration of financial services and products. First, the two aggregate indicators, bank branches and ATMs, are substantially lower in Africa than in other regions outside the continent. Second, the limited outreach of Africa's banking system is shown by the indicators of use. While only 9 percent of the population in Africa indicated that they have a line of credit or loan from a formal financial institution, this share was between 11 and 33 percent outside Africa. Similarly, 51 percent of the population in Africa indicated that they have an account with a formal financial institution, while the share is between 68 and 81 percent outside Africa (World Bank, 2024a).

This shallow and exclusive structure of the financial sector, especially in banking, has significantly influenced Africa's financial performance and outcomes (Beck et al., 2023). While shallow, less inclusive and concentrated, Africa's banking systems have proven to be stable and resilient. For example, Beck et al. (2023) reported that African banks are more profitable than banks in other regions, with approximately 1.6 percent return on assets (ROA) after tax in 2020 in the median African country, while it was 1.0 percent in countries outside Africa. Beck et al. (2019) attributed this profitability to the shallowness of the banking sector, which helped the region survive the global financial crisis of 2008 better than other regions internationally. The impact of the crisis was felt by the region through real sector channels, including low export goods demand and foreign direct investment in Africa. Due to limited connection with global financial markets and exposure to risky assets, financial institutions in the region largely avoided the direct effects of the global financial crisis.

When discussing the banking sector in Africa, it's important to recognise the significant variation across the continent. On one hand, Southern and Northern Africa have relatively developed banking systems that are solvent with adequate capital and sufficient banking liquidity (Nyantakyi & Sy, 2015; United Nations Economic Commission for Africa (UNECA), 2024b). However, the Southern African subregion faces challenges in relation to integration between the banking sector and non-banking financial institutions and low market capitalisation (United Nations Economic Commission for Africa (UNECA), 2024b).

On the other hand, smaller and poorer nations, such as South Sudan and Sierra Leone, situated in East and West Africa, grapple with shallow banking systems that offer only basic financial services, often lacking non-bank financial institutions or capital markets altogether. Despite these differences, there are sufficient similarities between the underlying economic circumstances that face the banking systems in Africa, specifically in SSA, which contribute to their relative underdevelopment. This includes limited access to formal financial products and services for different groups of people and businesses compared to other developing countries. There are four key characteristics that perpetuate underdevelopment in the banking sector in Africa compared to other regions in the developing world. Most of these factors are prevalent across many, if not all, African countries (Beck et al., 2023).

First, issues associated with governance challenges are persistent across many private and government institutions throughout Africa, undermining not only the market-based provision of financial services but also reform efforts and government interventions aimed at addressing market failures. These challenges affect a number of financial institutions, including government entities, banks, microfinance institutions, cooperatives and development finance institutions. Governance issues have been at the core of many financial crises in the region and directly affected the ability of financial institutions and markets to manage both unsystematic and systemic risks (Beck et al., 2011; Honohan & Beck, 2007).

Second, volatility, both at the individual and aggregate levels, raises the costs and erodes risk management for financial institutions. At the individual level, volatility is associated with informality and the fluctuations in revenue streams of many small businesses and households, making them less attractive to traditional financial institutions. At the aggregate level, volatility arises from the reliance of many African countries on export commodities, making them susceptible to the price shocks of commodities. In addition, political and social unrest, which have been experienced in Africa over the past 50 years of independence, contribute to the instability (Beck et al., 2011; Honohan & Beck, 2007).

Third, many African economies have small economies in size, driven by both low levels of income and the small size of individual countries, which limits the financial service providers from

maximising economies of scale. Consequently, this limits the demand for services such as insurance, savings, credit, and basic payment transactions, making the majority of the population commercially unviable customers for traditional banking. In addition, the widespread populations in many countries in Africa, with a significant percentage still residing in rural areas despite the increase in urbanisation, further complicate the cost-effectiveness of providing financial services outside urban centres. (Beck et al., 2011; Honohan & Beck, 2007).

Lastly, in Africa, a significant percentage of the economy and a large number of economic agents operate in the informal sector, lacking necessary documentation such as land titles, formal addresses and enterprise registration. This lack of documentation, which is important for facilitating financial transactions, increases the costs and risks for financial institutions. Consequently, most of the population is excluded from accessing traditional formal financial services and products (Beck et al., 2011; Honohan & Beck, 2007).

2.3 International and National Strategies for Financial Inclusion

2.3.1 International Financial Inclusion Strategies

Financial inclusion[3] is a multidimensional concept that has various definitions in the existing literature. "*Adopting a broader and multidimensional definition of financial inclusion is crucial because it helps to move beyond the often-erroneous assumption that inclusion will inevitably be achieved by simply offering enough access points*" (African Development Bank, 2013: 32). Universally, financial inclusion encompasses widespread, easy access to, availability and use of affordable formal financial services such as transactions, savings, payments, credit, and insurance by previously excluded businesses and citizens in society (Amidžić et al., 2014; Ozili, 2018; Ozili, 2020; Sahay et al., 2015; Sarma, 2008; World Bank Group, 2022a).

In addition, it is essential to note that financial exclusion can be voluntary or involuntary. Financial exclusion is voluntary when individuals have access to formal financial services but decide not to use them due to lack of demand, religion, or culture, among other reasons (Kempson & Whyley, 1999; Tita & Aziakpono, 2017). On the other hand, involuntary financial exclusion may occur

[3] The definition of financial inclusion is discussed in detail in Chapter four under the Theoretical review section.

because households live in remote areas, high service costs that make them unaffordable, unfavourable conditions due to financial products that do not suit people's needs, lack of knowledge because financial services are not marketed, and households may exclude themselves due to fear of being rejected (Kempson & Whyley, 1999; Tita & Aziakpono, 2017).

According to the African Development Bank (2013), involuntary financial exclusion in Africa occurs because people lack income and face high banking costs, distance and lack of documentation. For example, in East Africa, expensive banking costs, distance, and lack of documentation mainly contributed to involuntary financial exclusion (African Development Bank, 2013). In contrast, the lack of documentation was cited as the cause in West Africa (African Development Bank, 2013). On the other hand, in the Southern subregion, fixed and expensive fees for opening and maintaining an account were cited as the cause for involuntary financial exclusion (African Development Bank, 2013). In Africa, lack of documentation is a significant barrier to opening an account, particularly for young adults and adults with a primary education or less. At the same time, the distance from the service points is predominantly a barrier for adults who live in rural areas.

Additionally, the high cost of financial services and distance from service points are cited as the leading cause for financial exclusion for mostly adults with a primary or less education compared to those with a tertiary education (African Development Bank, 2013). Moreover, according to Tok and Heng (2022: 9), elderly people are also involuntarily excluded because of "*low digital capability; low financial literacy; cognitive decline; physical decline; social isolation; living on a fixed income, pension or annuity; reliance on family members; difficulty accessing financial advice; lack of financial products for older persons; and reliance on financial professionals"*.

Small and Medium Enterprises (SMEs) also face financial exclusion due to limited access to funding and credit, where lack of access to finance is cited as the primary constraint. For women, financial exclusion occurs due to economic factors such as earning low incomes, lack of assets, lack of access to finance like credit and accounts; social factors including cultural, religious beliefs that prohibit women from exercising their economic rights; and unfavourable enabling environment including inappropriate legal and regulatory systems to facilitate financial inclusion

for women (African Development Bank, 2013). Various international organisations have prioritised improving financial inclusion, recognising it as a key factor in social and economic development within policy frameworks aimed at achieving macroeconomic objectives (Khan, Khan, Sayal & Khan, 2022; Ozili, 2020).

The following section discusses the policies designed and implemented to improve financial inclusion internationally, mainly focusing on the initiatives by the world's leading organisations on financial inclusion policy and regulation. They include the World Bank, the Alliance for Financial Inclusion (AFI) and the Organisation for Economic Co-operation and Development (OECD).

2.3.1.1 The World Bank's Strategies

The World Bank is an essential development component, serving as a catalyst for poverty reduction and advancing shared prosperity worldwide to accelerate financial inclusion (World Bank Group, 2025a). The World Bank is made up of organisations, including the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA), the International Finance Corporation (IFC), the Multilateral Guarantee Agency (MIGA) and the International Centre for Settlement of Investment Disputes (ICSID), which make up the World Bank Group. The World Bank Group aims to reduce poverty and improve living standards by lending money to its member governments (World Bank, 2012a).

Despite progress, over 2.5 billion working-age adults globally lack access to quality and affordable financial services and products. Instead, they rely on informal methods to save, borrow, and protect their assets. This lack of financial access mainly presents challenges for SMEs, where nearly 200 million do not have access to affordable financial services and products due to underdeveloped financial systems to serve their needs. Challenges remain toward building a more inclusive financial sector to spur economic growth and reduce poverty (World Bank, 2013a; World Bank, 2013b). Addressing these challenges is crucial for fostering a more inclusive financial sector that drives economic growth and reduces poverty. Therefore, the World Bank, together with its partners, has introduced a range of strategies, including the National Financial Inclusion Strategy (NFIS), the Financial Inclusion Support Framework launched in April 2013, and a vision to

achieve Universal Financial Access by 2020, which was put forward in a World Bank Group forum held in October 2013 (World Bank, 2013b).

i) Financial Inclusion Support Framework (FISF)

Launched in April 2013 by the World Bank Group and endorsed by the G20 Financial Ministers and the Alliance for Financial Inclusion (AFI), the FISF is a strategy that seeks to advance and increase the success of actions taken by countries to achieve the goals for national financial inclusion. This initiative is financed by the Netherlands Ministry of Foreign Affairs and $6.7 million from the Bill & Melinda Gates Foundation. The FISF supports activities encouraging the use of a wide range of financial services and products, such as insurance, credit, payments and savings by Micro Small and Medium Enterprises (MSMEs) and low-income people who are underbanked and underserved. The FISF comprises country support and knowledge-based initiatives. The country support programmes include technical support in capacity building, data, analytics, and consulting services. These programmes include national financial inclusion strategies, financial infrastructures, credit reporting and payment systems, diversified financial services for individuals and businesses, financial capacity, and consumer protection in the financial domain. The knowledge-based component facilitates analysis, synthesis, and knowledge sharing in marginalised areas, such as the financial inclusion of women and people working in agriculture and utilising digital payments to access a broader range of financial services (World Bank Group, 2022a).

ii) The World Bank's National Financial Inclusion Strategy (NFIS)

The NFIS has gained prominence among the leading financial inclusion organisations. The rapid adoption of NFIS is motivated by the logic that greater financial inclusion can lead to inclusive growth and development, and national strategies for financial inclusion can play a significant role in accelerating this process. For example, the introduction of the Mzantsi accounts by the South African Financial Sector Charter increased the percentage of banked adults from 46 percent to 64 percent within four years, with the opening of six million basic bank accounts, while the United Kingdom saw a 50 percent decline in the number of unbanked adults through various policy interventions. This evidence is supported by the World Bank report stating that countries that

implemented an NFIS have experienced an increase in financial inclusion compared to countries that did not (AFI, 2018a).

In the World Bank context, NFIS refers to the action plans defined and adopted at the national level, which national governments follow to achieve financial inclusion targets. NFIS provide an essential opportunity to introduce an evidence-based approach to expanding access and usage of financial services. It includes six main building blocks for effective design and execution: Data and Diagnostics, Targets and Objectives, Leadership and Coordination, Strategy Formulation, Strategy Implementation and Monitoring and Evaluation. The NFIS can harness the enabling foundations and drivers identified as critical to achieving universal financial access and build on those measures to promote the access and use of a broad range of financial services. Successful strategies promote a more effective and efficient process to accelerate financial inclusion. The World Bank Group is working with more than 50 countries committed to developing National Financial Inclusion Strategies. The World Bank NFIS is organised based on a set of policy areas that can assist in structuring the NFIS elements, monitoring and evaluation systems.

First, data and diagnostics include financial inclusion indicators that can be used to set NFIS and monitor progress towards achieving them. Second, targets and objectives can help countries identify a set of available, relevant indicators of inclusion to serve as the foundation for their target-setting processes. Third, leadership and coordination are needed to formulate and implement NFIS, including forming a governance structure with a clear mission and allocated funds. Fourth, strategy formulation includes providing a technical drafting process that draws on the depth of knowledge and experience of international and national specialists in several priority areas of the financial sector. Fifth, strategy implementation consists of the actions and reforms outlined in the strategy and the clarity of the duties and responsibilities of each implementing institution. Sixth, monitoring and evaluation are necessary to ensure the plan is implemented as intended and to adjust policies and other measures in real time (World Bank, 2015).

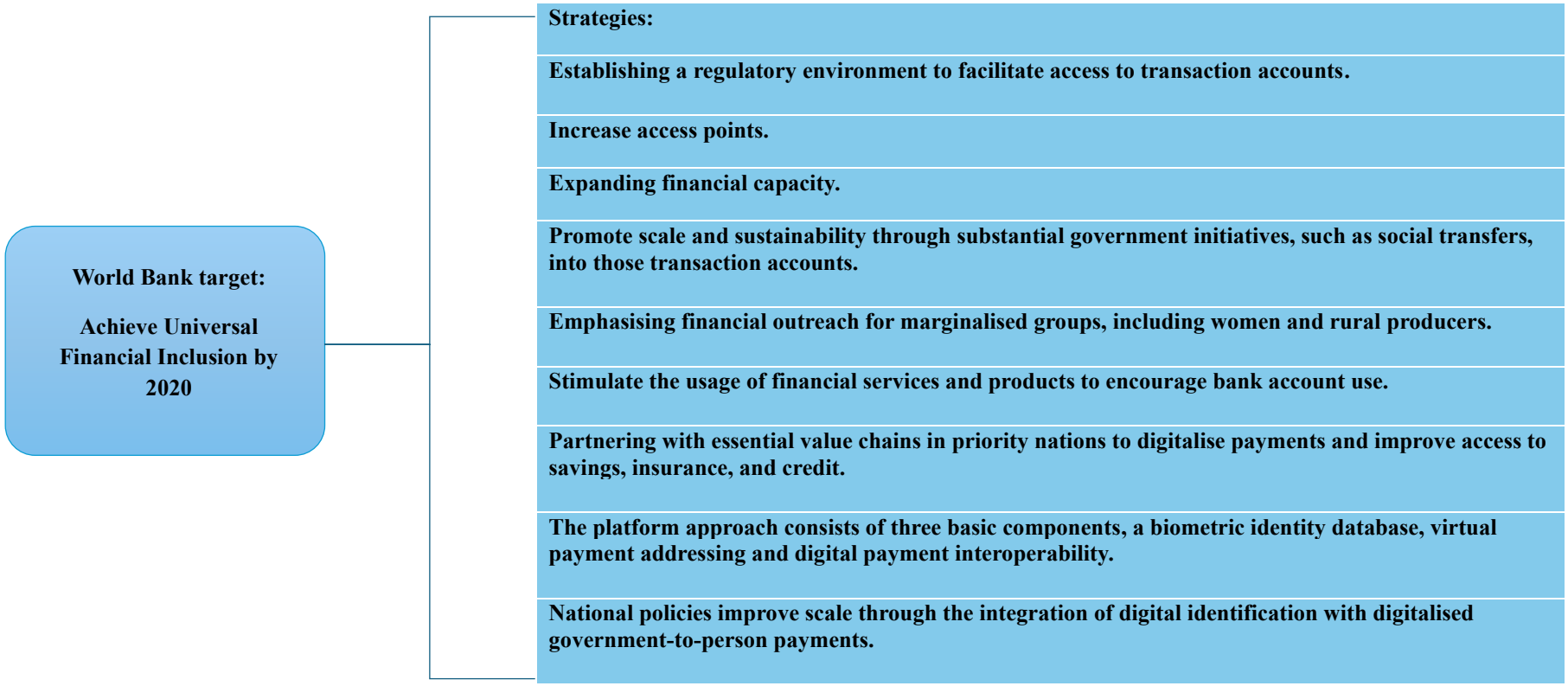
iii) Universal Financial Access by 2020 (UFA 2020) Strategy

The World Bank Group recognised that approximately 2.5 billion working-age adults globally lack access to quality and affordable financial services. In addition, SMMEs face significant barriers to

accessing finance due to underdeveloped financial systems. To address this, the World Bank Group introduced an initiative in 2013 at their forum gathering to achieve universal finance by 2020. This initiative is informed by the belief that financial inclusion is an effective driver of economic progress, aiding the World Bank Group's goal to reduce poverty and promote shared prosperity. Additionally, access to financial services and products such as savings accounts, remittances, credit, and insurance can enable people to afford essentials like education and healthcare while reducing risk and supporting business expansion and job creation. The UFA 2020 strategy seeks to ensure universal access to financial services and products, and ensure that these services and products are suitable to the needs of the customers and are available to individuals at different income levels, since financial access creates a path to poverty reduction and shared prosperity (World Bank, 2013b; World Bank, 2013c; World Bank Group, 2018).

Universal financial access by 2020 aims to promote financial inclusion through universal financial access and frequent use of formal financial services, where all individuals (both women and men) and businesses (despite their location, income level, or social status) can access a wide range of quality, customised and affordable financial services and products. The target is to eliminate financial access and usage barriers such as cost, distance, lack of information, or infrastructure (availability of service points) so that everyone can participate in the financial system, which can drive inclusive growth, poverty reduction, and shared prosperity globally. Nations are now clearly embracing policy and legal reforms to reduce the costs and risks of reaching the unbanked and the underserved. More than 50 countries have now made commitments or set targets for financial inclusion, with more countries adopting such strategies and action plans (World Bank Group, 2018). The target to achieve universal financial access and frequent use by 2020 is informed by the Payment Aspects of Financial Inclusion framework developed in 2015, and it entails the strategies listed in Figure 2.1 below.

Figure 2. 1: Achieve Universal Access by 2020 Strategy



Source: Created by author using World Bank Group (2018)

2.3.1.2 Alliance for Financial Inclusion (AFI) Strategies

The Alliance for Financial Inclusion (AFI) is a prominent organisation that promotes policies and regulations to advance financial inclusion worldwide. It is dedicated to helping its members achieve financial inclusion and contribute to inclusive development and poverty reduction. The organisation is driven by a network of central banks and other financial regulatory institutions, providing a platform for developing and emerging economies to enhance the well-being of the underprivileged by creating and implementing policy solutions for financial inclusion (AFI, 2022; AFI, 2024a). To fulfil its mandate of making financial services and products more accessible to the world's unbanked population, the AFI network has developed several policies. These include the Maya Declaration, which laid the groundwork for the development of the Accords, namely, the Sochi Accord, Kigali Statement, Sharm El Sheikh, Denarau Accord, Maputo Accord, Sasana Accord, and the formulation of the National Financial Inclusion Strategy (AFI, 2024a; AFI, 2024b).

i) The Maya Declaration

The Maya Declaration was launched and adopted by AFI members during the 2011 Third Global Policy Forum (GPF) event in Mexico as a global commitment platform to unlock economic and social potential (AFI, 2020). The Maya Declaration is an international effort to promote responsible and sustainable financial inclusion. Its purpose is to lower poverty and promote financial stability across the world. The Maya Declaration embodies the fundamental values of AFI. It marks the first global and measurable series of commitments from governments in emerging and developing countries to advance the agenda for financial inclusion (AFI, 2023). A public endorsement of the Maya Declaration serves as a platform to advocate for financial inclusion and to contribute to various Sustainable Development Goals (SDGs), including no poverty, gender equality, decent work and economic growth and climate change. The Maya Declaration provided the foundation for AFI members to formulate and implement a set of Accords, action plans and declarations that outline the specific objectives and aim to address various aspects of financial inclusion, which encompasses not only access to financial services and products, but also the usage and quality of these services and products (AFI, 2019a; AFI, 2023). As of November 2022, the Maya Declaration comprised of 1,023 targets to which member

institutions had committed. These targets are organised based on a set of themes in Table 2.2 below (AFI, 2022; AFI, 2023).

Table 2. 2: Maya Declaration themes and sub-themes

Themes and sub-themes
• **Consumer empowerment and market conduct** *-Financial literacy and financial education* *-Consumer protection*
• **Credit information system**
• **Digital financial services** *-Agent banking* *-National payment systems* *-Mobile financial services* *-E-money* *-FinTech*
• **Financial inclusion data**
• **Financial inclusion of forcibly displaced persons**
• **Financial inclusion of youth**
• **Gender inclusive finance**
• **Global standards** *-Financial identity* *-Financial integrity* *-Financial stability*
• **Inclusive green finance**
• **Microcredit and micro-savings**
• **Microinsurance**
• **National Financial Inclusion Strategies**
• **Overarching national goal**
• **SME finance**

Source: Author's own compilation from AFI (2022) and AFI (2023)

ii) Alliance for Financial Inclusion Accords

The Maya Declaration provided a set of Accords, the Sharm El Sheikh, Denarau Accord, Maputo Accord and Sasana Accord, which will be discussed below.

- **Sasana Accord**

The AFI network met at the AFI GPF in September 2013 and launched the Sasana Accord. The Accord aims to reaffirm its dedication to achieving financial inclusion by reinforcing a set of measurable national targets. These include implementing evidence-based financial inclusion policies and strategies on access, usage, and quality of financial services and products designed to accelerate progress and measure their impacts (AFI, 2019b; AFI, 2022).

- **Maputo Accord: SME Finance as a Path to Greater Financial Inclusion**

At the 2015 AFI network GPF, the members acknowledged that SMEs are the engine for growth. They identified that limited access to finance is the leading obstacle to the progress and long-term success of SMEs. The Maputo Accord was launched at this gathering, aiming to promote financial inclusion for SMEs by developing and implementing regulatory policies. At the 2021 AFI general meeting, the members reaffirmed their commitment to supporting SME finance. They also pledged to create policy interventions that promote access to affordable financial services, utilising FinTech (AFI, 2021).

- **Denarau Accord: Denarau Action Plan on Gender Inclusive Finance**

In 2016, the AFI members introduced the Denarau Action Plan (DAP). This initiative was launched in response to the persistent gender inequality in financial access, with more than one billion women remaining excluded from financial services and products globally. The Denarau Action Plan aimed to prioritise gender and women's financial inclusion by improving their access to and use of quality financial services and products, fostering financial inclusion. It entailed identifying measures and creating an environment conducive to accelerating women's inclusion, aiming to improve the number of women with access to affordable financial services and products worldwide (AFI, 2019a).

- **Sharm El Sheikh: Financial Inclusion, Climate Change and Green Finance**

After recognising financial exclusion and climate change as the leading obstacles to financial stability and the need to design and implement financial inclusion policies and regulatory reforms which align with the 2030 agenda for Sustainable Development and the Paris Agreement on climate change, the AFI members endorsed the Sharm El Sheikh Accord in a GPF gathering in 2017. This Accord seeks to address the intertwined challenges of financial exclusion and climate change by collaborating with partners to identify, understand and implement financial inclusion policy solutions that benefit the environment, mainly focusing on communities most vulnerable to climate change (AFI, 2019c).

- **Sochi Accord: FinTech for Financial Inclusion**

Upon recognising the importance of developing policy interventions that balance fostering innovation in technology-based financial services (FinTech) and ensuring appropriate oversight. The AFI members introduced the Sochi Accord at the 2018 AFI GFP gathering, strengthening their commitment to using digital financial services and FinTech to advance financial inclusion. This commitment was undertaken following the recognition that FinTech is the engine to accelerate access to and use of financial services, specifically among marginalised and underprivileged groups and the Micro, Small and Medium Enterprises (MSMEs), reducing cross-border financial services costs while promoting financial stability and integrity (AFI, 2018b).

- **Kigali statement: Advancing Financial Inclusion for Underprivileged Groups**

Launched at the 2019 GPF in Rwanda, the Kigali statement seeks to advance financial inclusion for underprivileged groups. It is committed to supporting the potential of women, youth, disadvantaged and marginalised groups to drive inclusive growth. This recognises their role as active contributors to building a sustainable future for the coming generation. This initiative followed the recognition that financial inclusion is a crucial enabler of the SDGs and an engine for inclusive growth (AFI, 2020). Table 2.3 summarises the AFI Accords launched between 2013 and 2019, with the Maputo Accord updated in 2021, while the Sharm El Sheikh, Sachi and Denarau Accords were updated in 2022.

Table 2. 3: Accords launched between 2013 and 2019

Accord Number	Accord Name	Year Launched	Year Updated
1	Sasana Accord	2013	2022
2	Maputo Accord	2015	2021
3	Denarau Accord	2016	2022
4	Sharm El Sheikh	2017	2022
5	Sochi Accord	2018	2022
6	Kigali Statement	2019	-

Source: Author's compilation from (AFI, 2024b) and (AFI, 2022) with the title, Smart Goals, Smart Policies

iii) Alliance for Financial Inclusion: National Financial Inclusion Strategy (NFIS)

The NFIS have become increasingly prominent and is being adopted by many institutions, including the AFI, World Bank, and the G20 Global Partnership for Financial Inclusion (GPFI). The 2011 Maya Declaration significantly boosted interest in these strategies. By the end of

September 2015, out of the 57 institutions committed under the Maya Declaration, 35 pledged to develop and implement an NFIS, with 16 already having completed their strategies. Further evidence of this interest is reflected in a poll from the 2012 AFI GPF in Cape Town, South Africa, where it was confirmed that an NFIS is vital for advancing financial inclusion (AFI, 2015; AFI, 2022).

The AFI financial inclusion strategy is a comprehensive national document designed to improve financial inclusion systematically within the AFI member countries (AFI, 2020). An NFIS typically includes an analysis of the current financial inclusion status and identifies constraints alongside proposed strategies to achieve these targets. It also outlines methods for measuring the progress and achievements of the NFIS (AFI, 2018a). These strategies are structured around key thematic priorities summarised in Table 2.2, which are considered crucial by AFI members. While NFIS implementations in all AFI members in the MENA, and Eastern Europe and Central Asia (EECA) regions are generally in their initial stages, more than 40 percent of countries in the Latin America and Caribbean (LAC) and Pacific (PAC) region progressed to second and third versions of their NFIS (AFI, 2022).

The various AFI member regions make notable efforts. For instance, as of 2022, there has been a significant increase in the number of countries that have launched their NFIS, with Asia leading with 92 percent, followed by the Pacific at 88 percent, Africa at 87 percent, and Latin America and the Caribbean at 69 percent (AFI, 2022). There has also been a notable increase in the number of countries formulating their NFIS in each region since 2018. It is worth noting that eight countries within the AFI network (namely, Fiji, Liberia, Malawi, Papua New Guinea, Russia, South Africa, Solomon Islands and Tanzania) have completed implementing their first NFIS, and four of these (Fiji, Papua New Guinea, Solomon Islands, and Tanzania) have formulated and are implementing their second national strategy. As of 2022, South Africa had joined the AFI network as a member and is at the formulation stage of their second NFIS since the first one was implemented in 2018 when they were just part of the network and not members. Table 2.4 provides the countries with NFIS and those in the formulation phase of their NFIS.

Table 2. 4: AFI National Financial Inclusion Strategies: Countries with NFIS and those in the formulating phase

Region	Countries with NFIS	Countries formulating NFIS
Africa	29	6
Middle East	2	1
Asia	12	1
East Europe and Central Asia (EECA)	4	2
Latin America and the Caribbean (LAC)	9	2
Pacific	7	1

Source: Author's compilation from AFI (2022)

2.3.1.3 The Organisation for Economic Co-operation and Development (OECD) Strategies

The OECD, comprised of higher-income countries, began working on the financial inclusion field in 2005, focusing on the demand-side of financial inclusion. They published a chapter that outlined the importance of financial education for bringing the unbanked and underserved into the financial system (OECD, 2005; World Bank Group, 2019). The OECD acknowledged the significance of improved financial inclusion for financial stability and inclusive development worldwide. Financial inclusion impacts 2.3 billion working-age adults globally due to supply-side barriers, such as geographical and regulatory constraints, and demand-side barriers, including lack of financial literacy or language barriers (Atkinson & Messy, 2013). According to the OECD, "*financial inclusion is an international policy priority and demand-side initiatives including financial education have an important role in helping individuals to access and use appropriate formal financial products*" (Atkinson & Messy, 2013: 3).

In its policy interventions, the OECD and the International Network on Financial Education (INFE) suggested that financial literacy policies, such as financial education, should be implemented as a policy intervention to improve financial inclusion. This was to recognise that financial literacy policies complement approaches reinforcing financial inclusion to enhance financial resilience and well-being. This is because financial literacy can improve the level of financial knowledge and thus foster informed and responsible use of a wide range of financial products and services (Atkinson & Messy, 2013). The financial education policy is the "*process by which financial consumers/investors improve their understanding of financial products, concepts and risks and, through information, instruction and/or objective advice, develop the skills*

and confidence to become more aware of financial risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being" (Atkinson & Messy, 2013: 11; OECD, 2005).

It entails equipping people with financial knowledge and skills to help them make informed decisions. The OECD helps countries develop and implement financial education policies and programmes, such as public awareness campaigns to inform the public about essential personal finance issues, such as risk, fraud, financial resilience, tailored training, guidance or advice in person or through remote channels (OECD, 2020b; OECD, 2024a). This policy is aimed at those who are financially excluded in terms of having no formal financial products, those using a limited variety of products, and the inexperienced and newly included customers. The policy targets of financial education for financial inclusion are typical to reinforce an emergent financial services sector and provide consumers with the necessary skills and awareness they need to operate in the existing financial system to enhance their financial well-being and opportunities (Atkinson & Messy, 2013). The financial education policy has several benefits for the unbanked and underserved, as shown in Table 2.5.

Table 2. 5: Direct and indirect benefits of financial education

Direct benefits	**Indirect benefits**
• Lowered expenses for finding information among those without banking services. • Increased levels of savings in households. • Safeguarding against unjust practices, like predatory lending. • Decreased expenses for transferring money (including government transfers to individuals).	• Enhanced comprehension of conventional financial services and encouragement to avoid non-traditional options. • Deeper insight into the risks and benefits of financial services like credit.

Source: Author's compilation from Atkinson and Messy (2013)

2.3.2 Financial Inclusion Strategies in Africa

Given the widely held view that financial inclusion is the engine for inclusive economic growth, poverty reduction and shared prosperity (World Bank, 2013c), many African nations have prioritised improving financial inclusion by adopting frameworks developed by international organisations, such as the National Financial Inclusion Strategy. The reason for this is that African countries are faced with significant challenges concerning high levels of income inequality and financially excluded people (African Development Bank, 2013; Chancel, Cogneau, Gethin, &

Myczkowski, 2019; Khan et al., 2022; Tchamyou, 2020; Tchamyou, Erreygers & Cassimon, 2019). This section will explore the policy frameworks that are developed by African countries based on international strategies. These initiatives seek to accelerate financial access and frequent use of formal financial services for all individuals (both women and men) and businesses, regardless of their location, income level, or social status. The goal is to ensure that everyone can access a wide range of quality, customised and affordable financial services and products. In Africa, they developed several policy frameworks informed by National Financial Inclusion Strategies by the World Bank and AFI to coordinate capacity building and learning efforts. The NFIS comprises the action plans defined and adopted at the national level, which national governments follow to achieve financial inclusion targets**.** It includes five main building blocks for effective design and execution: Targets and Objectives, Leadership and Coordination, Strategy Formulation, Strategy Implementation and Monitoring and Evaluation. These are discussed below:

i) Targets and Objectives: Can help countries identify a set of available and relevant financial inclusion indicators to use as the foundation for their target-setting processes.

ii) Governance and Structure:
Leadership and coordination are needed to formulate and implement NFIS, including forming a governance structure with a clear mission and allocated funds.

iii) Strategic Plan:
The strategic plan consists of formulation and implementation. The formulation includes providing a technical drafting process that draws on the depth of knowledge and experience of international and national specialists in several priority areas of the financial sector. Implementation of the strategy consists of the actions and reforms outlined in the plan and the clarity of the duties and responsibilities of each implementing institution.

iv) Monitoring and Evaluation Framework:
Monitoring and evaluation are necessary to ensure the plan is implemented as intended and to adjust policies and other measures in real time (AFI, 2022; World Bank, 2015).

The NFIS is discussed below because it is the widely adopted policy with documents available for various African countries, making it possible to explore how this strategy was adopted. The table below shows the African countries with National Financial Inclusion Strategies guided by the

World Bank and AFI frameworks. The African countries included in Table 2.6 below are based on the countries that will be used in this study and are considered countries that have adopted the NFIS strategy[4].

[4] Table 2.7 on page 255 in the appendices shows the list of African countries with NFIS.

Table 2. 6: Summary of National Financial Inclusion Strategies in Selected African Countries

Countries	Strategic framework		Governance and structure	Implementation plan	Monitoring and evaluation framework
	Objectives	**Targets**	**Leadership and Coordination**		
Botswana	• To provide financial inclusion to lower-income households and underserved groups • To enhance financial sector infrastructure • To facilitate well-targeted credit to productive enterprises and for investment in assets	• Formal employees • Farmers • Informal SMMEs • Informal employees • State dependents • Private dependents	• The Steering Committee, under the chairmanship of the Ministry of Finance and Development Planning (MFDP), will continue to be responsible for the Making Access Possible (MAP) process, championing and providing leadership and coordination • The MFDP will lead the Steering Committee in making key decisions and appointing and running technical subgroups for various work areas	• The Steering Committee and its structures will lead to the implementation of strategies to enhance financial inclusion • Implementation will also depend on the role played by the private sector, especially the banks, insurance companies, retailers and Ministry of Finance and Development Planning (MNOs)	• The MFDP will monitor and evaluate the proposed outcomes and provide regular reports to various government organs
Burundi	• To ensure increased access to and usage of financial services and products • Availability of quality financial services and products that meet the needs of the consumers • Enhance the environment for financial inclusion	• Rural population • Women and youth • Micro and small entrepreneurs	• Implementation of the NFIS will be ensured by the Coordination and Monitoring Committee (CMC-NFIS) • This committee will be assisted by an Executive Unit responsible for executive tasks • The CMC-NFIS will set up Technical Groups (TG)	• Coordinate the implementation of the NFIS by ensuring that the actions planned are correctly executed and that those assigned under the operational plan fulfill their responsibilities	• The Executive Unit of the CMC-NFIS will ensure permanent monitoring of the execution of the NFIS and produce the reports • Produce annual work plans jointly with the committee • Annual meetings are planned with representatives of these strategies in order to ensure proper coordination
Eswatini	• To ensure regulation and licensing	• Rural finance • Microfinance • MSMEs finance	• The Ministry of Finance coordinated the strategy development process in	• The role of the FICA will be to coordinate and monitor the	• The MoF, in collaboration with the CBS and the FSRA, is

Countries	Strategic framework		Governance and structure	Implementation plan	Monitoring and evaluation framework
	Objectives	**Targets**	**Leadership and Coordination**		
	• To promote affordable product pricing • To promote gender equality, financial capability and consumer protection	• Agricultural finance • Women and youth finance	collaboration with the financial regulators, the Central Bank of Swaziland (CBS) and the Financial Sector Regulator Authority	implementation of the NFIS • This is done by ensuring that the actions planned are correctly executed and that those responsible for these actions under the operational plan assume their responsibilities	coordinating the process of implementing inclusive access to financial services, with the private sector taking an active role in the delivery of the financial mechanisms
Madagascar	• To promote financial education and consumer protection • To improve access and use of financial services • To strengthen policies, legal, regulatory and institutional frameworks	• All population	• CNFI is in charge of the coordination and the monitoring & evaluation of the implementation of the NFIS. It also provides secretariat services for the Steering Committee, the Working Groups and the Investment Committee	• The main NFIS implementing body is the Steering Committee, supported by the Working Groups and the Investment Committee	• CNFI is in charge of the monitoring & evaluation of the implementation of the NFIS • This occurs through progress reports and key indicators such as access points for 10,000 adults
Mozambique	• To ensure an inclusive financial sector	• Micro-, Small- and Medium-sized Enterprises (MSMEs) • Adult population	• The National Financial Inclusion Committee shall be responsible for the implementation of this strategy	• Coordinate continuously with the Financial Sector Development Strategy Implementation Unit, exchanging the necessary information to facilitate reporting on the implementation of this strategy to the structures of the Financial Sector Development Strategy	• The national-level coordination structure shall facilitate the implementation and adequate follow-up of the actions proposed herein and their adjustment where necessary • The monitoring and evaluation mechanism shall ensure the provision of appropriate and relevant information to all the parties concerned
Namibia	• To develop a more resilient, competitive and dynamic	• SMEs • Rural people	• To the establishment of an inter-ministerial Financial	• An implementing Committee consisting of	• Half-yearly progress report by the

Countries	Strategic framework		Governance and structure	Implementation plan	Monitoring and evaluation framework
	Objectives	**Targets**	**Leadership and Coordination**		
	financial system with best practices		Inclusion Council that will provide policy direction and monitor the implementation of strategies to enhance financial inclusion in Namibia	the Permanent Secretary of the Ministry of Finance, the Governor of the Bank of Namibia and the Chief Executive Officer of NAMFISA will be responsible for the implementation of the financial inclusion agenda	implementing committee regarding the status of financial inclusion
South Africa	• To promote improved and sustainable access to and the use of quality, appropriate, and affordable financial products and services • To ensure measurable socio-economic benefits for all South Africans	• Low-income earners • Underserved adult population: women, rural residents and youth • SMMEs	• An intra-government Financial Inclusion Sub-Working Group (FISWG) established under the Council of Financial Regulators • A Financial Inclusion Forum (FI forum) for industry and other non-governmental stakeholders to engage policymakers and regulators on strategic priorities	• The FISWG will coordinate interactions with regional and international bodies engaged in the promotion of financial inclusion in S.A	• FSCA will participate in the arrangement to fund and participate in the design of the Finscope survey • Through these surveys, FSCA will be able to ensure that the questions posed in the survey provide information that may relate to particular areas of concern and achieve the set objectives
Tanzania	• From access to usage • To provide financial education and financial literacy programmes for women • To prioritise young adults aged below 25 years. Enabling this group with digital IDs, access to phones and life skills • To increase access and usage of financial products and services by the underserved MSMEs	• MSMEs • Women • The poorest quantile of the population • Youth	• The framework is coordinated by the National Council (NC), the National Steering Committee (NSC) and the National Technical Committee (NTC)	• Ministries and government bodies will develop policies and a supporting environment to allow financial deepening • Regulators will develop and enforce regulatory framework to support financial inclusion • Associations will represent and coordinate their members in the implementation of Framework activities.	• The National Council (NC) is responsible for monitoring and evaluation of the National Financial Inclusion performance and coordinated by the National Secretariat • Establish a reliable internal monitoring system: data collection and analysis, performance measurement, period reports, research, surveys

Countries	Strategic framework		Governance and structure	Implementation plan	Monitoring and evaluation framework
	Objectives	**Targets**	**Leadership and Coordination**		
				• Development partners will provide financial and technical support for the implementation of the Framework	
Uganda	• To reduce financial exclusion and access barriers to financial services • To develop the credit infrastructure for growth • To build out the digital infrastructure for efficiency • To deepen and broaden formal savings • To empower and protect individuals	• Women • Youth • Rural populations	• The Steering Committee, including the Minister of Finance, Planning and Economic Development – Chairperson	• The Inter-Institutional Committee on Financial Inclusion (IICFI) will develop a communication mechanism related to the NFIS • The NFIS Secretariat will have full-time staff and dedicated resources to manage the process, coordinate, and compile reports on the NFIS • The Secretariat will support the IICFI Working Groups and help facilitate any financial inclusion forums	• The IICFI is responsible for the oversight and implementation of the NFIS • The IICFI provides an annual report regarding the status of financial inclusion in the country • To monitor progress, each working group will report its progress quarterly to the NFIS Secretariat

Source: Compiled by author using World Bank (2022a) National Financial Inclusion Strategies Resource Center, AFI (2022). Countries excluded from the table are those whose NFIS were not publicly accessible, were still under formulation, or did not exist at the time the study was conducted.

2.4 Financial Inclusion Trends: Comparison between International Regions and Africa

This section builds on the previous discussion of international and national initiatives to improve financial inclusion by examining the actual trends over time. It explores the broader patterns of financial inclusion across its different dimensions. By analysing these trends, the section aims to provide a clearer understanding of the progress made and the challenges that remain in achieving financial inclusion for all.

Existing datasets provided by the Global Findex Datasets of the World Bank, International Monetary Fund (IMF) Surveys and Statista show that Africa still has a less inclusive financial system than those outside of Africa. This is evident from the recent dataset showing that large segments of the population are excluded in terms of access and availability of service points, usage of bank accounts, and access to credit. This implies that most of the population, particularly SMEs, low-income earners, the poor and marginalised groups (including women and youth), are still financially excluded (African Development Bank, 2013; World Bank Group, 2024a). It is worth noting that the African continent has enormous variations within the region. On one hand, economies like South Africa and Mauritius, located in Southern Africa, have developed banking systems and capital markets. In contrast, countries like South Sudan and Sierra Leone, located in East and West Africa, have shallow banking systems that provide basic financial services with few non-bank financial institutions and capital markets (Beck et al., 2023). As a result, even though some countries show growth in financial access and usage, many have high financial exclusion levels due to the lack of developed financial systems and poor infrastructure. This led to low levels of financial inclusion in Africa (African Development Bank, 2013). The following section presents an overview of financial inclusion trends in Africa relative to other regions based on financial inclusion dimensions, including financial access, usage, penetration, and quality. The study focused on these dimensions due to the availability of data, while the data for the cost dimension is not available for the region under study.

i) Access to and Availability of Formal Financial Services and Products

Worldwide, 53 percent of adults report owning a debit card, while commercial banks, ATMs, mobile money accounts and having an account at a financial institution are about 11, 39, 10 and 74 percent respectively. The first three measures of financial access and availability shown in

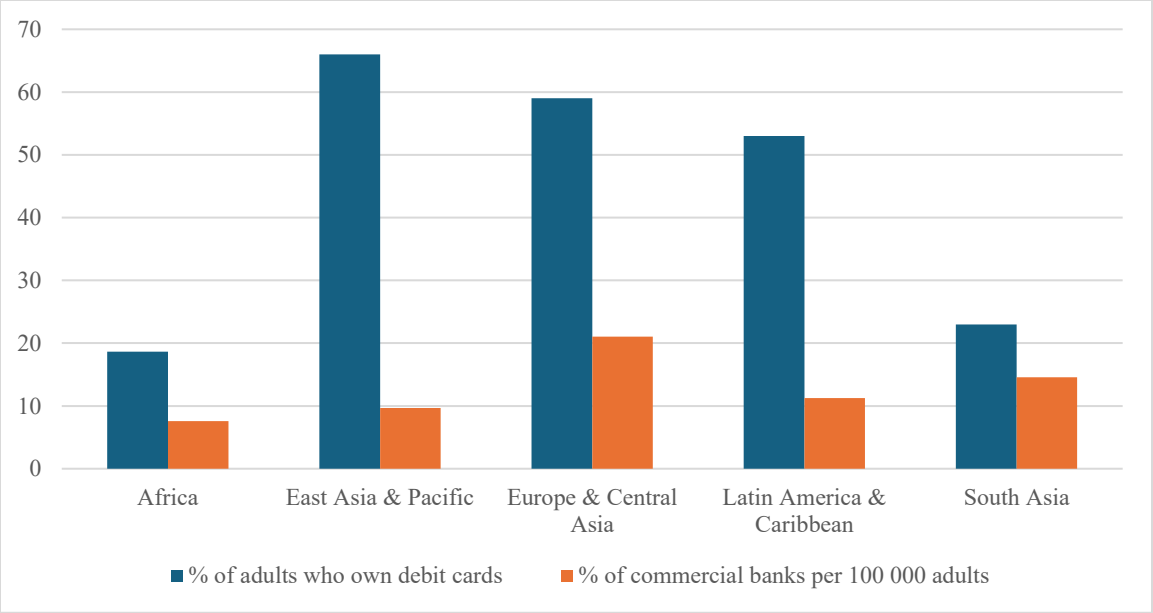
Figures 2.2, 2.3 and 2.4 indicate that Africa is falling behind other regions according to global ratings. However, when it comes to mobile money accounts, as depicted in Figure 2.5, Africa is leading in comparison to other regions. In 2021, the World Bank data showed that East Asia and the Pacific were leading, with 66 percent of the population owning debit cards and 80 percent of people having accounts at financial institutions. Meanwhile, Europe[5] and Central Asia led the penetration of banking service points by 21 and 55 percent respectively. On the other hand, Africa had the lowest financial access in terms of the percentage of people who own debit cards, had accounts at financial institutions and the availability of service points. Figures 2.2 and 2.4 show that only 19 percent of the adult population own debit cards, while only 34 percent have accounts at financial institutions in Africa.

In comparison, commercial banks and ATM penetration were only 8 and 13 percent, respectively, per 100,000 adults. This shows that African economies are at the low end of the spectrum, with fewer commercial bank branches and ATMs per 100,000 adults and low account penetration due to a lack of infrastructure (African Development Bank, 2013). For many people, such service points are an entry point into a formal financial system since their availability makes it easier for the public to open bank accounts. Therefore, the lack of service points constrains people from accessing the financial system, especially those who cannot travel to where service points are available, leading to a rise in involuntary financial exclusion (Demirgüç-Kunt & Klapper, 2012). Furthermore, Africa has demonstrated a high level of accessibility to mobile money accounts, leading other regions by 33 percent. This can be attributed to the fact that more than half of the 282 mobile money services, specifically 166, are located in this region (Chironga, De Grandis & Zouaoui, 2017; Hall, 2024). The wide availability of services such as M-Pesa, MTN Mobile Money, Orange Money, Airtel Money, Ecocash, and Tigo Pesa contributes significantly to this growth (AZA Finance, 2025; Hall, 2024). In Africa, mobile money is available to the adult population without access to bank accounts, bringing financial inclusion to the underbanked (Statista, 2025; World Bank Group, 2024c). Figures 2.2, 2.3, 2.4 and 2.5 present access to financial services and products in terms of commercial banks and ATMs per 100,000 adults, the percentage

[5] Europe is included to represent the developing countries in Europe, including Poland and Ukraine. Australian Government of Foreign Trade Affairs. 2022. List of developing countries as declared by the Minister for Foreign Affairs. Available at: https://www.dfat.gov.au/sites/default/files/list-developing-countries.pdf

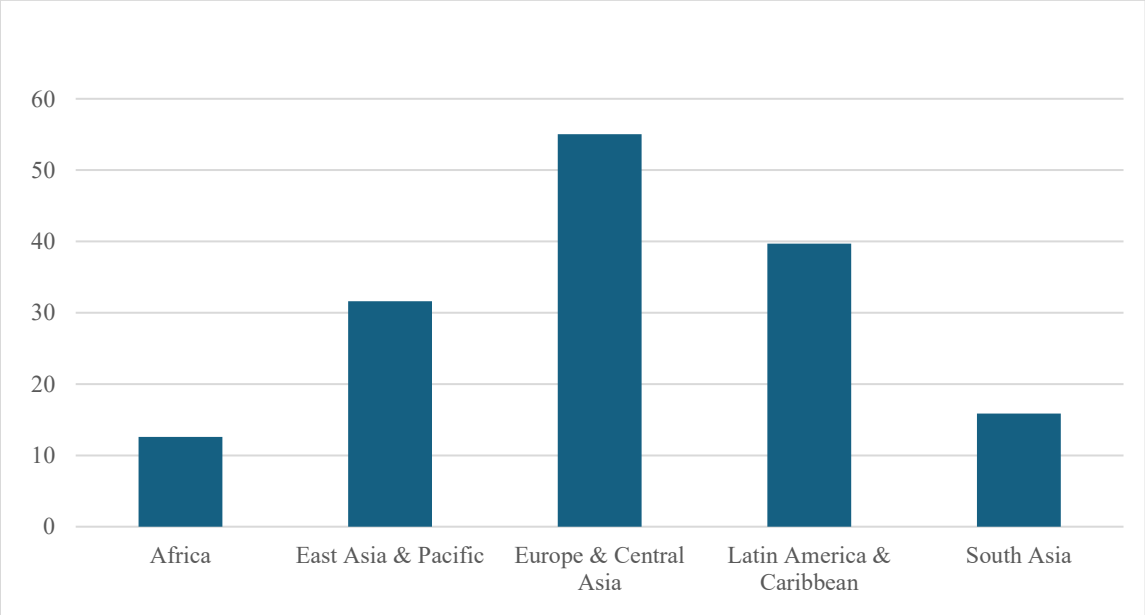
of adults with accounts at financial institutions, and the percentage of adults with mobile money accounts.

Figure 2. 2: Percentage of adults who own debit cards and percentage of commercial banks per 100,000 adults



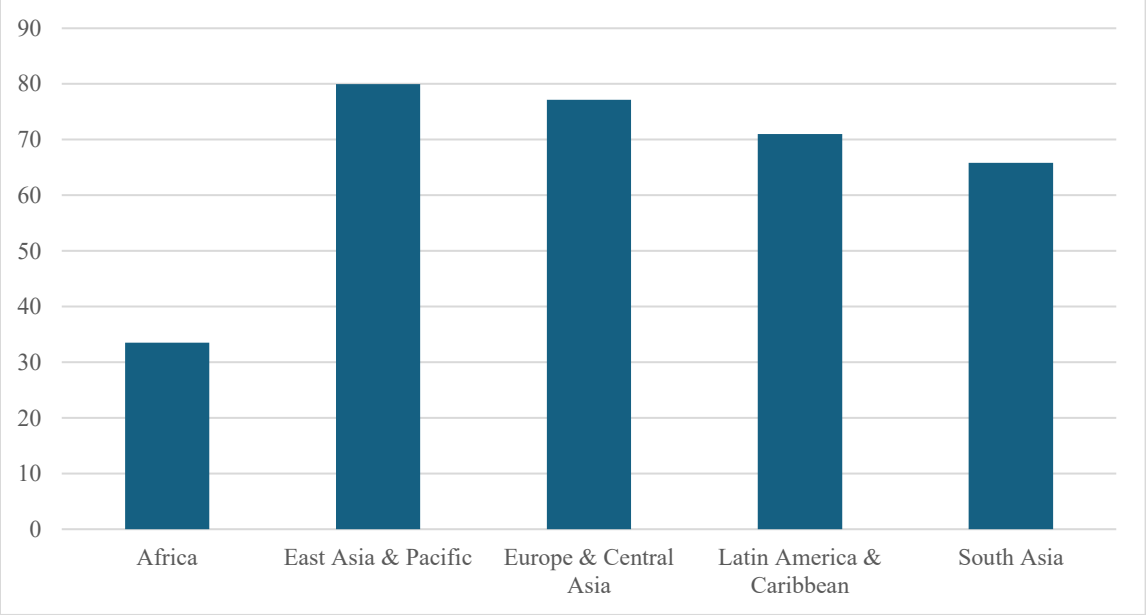
Source: Author's compilation from the World Bank (2024a) Global Findex Database 2021

Figure 2. 3: Number of ATMs per 100,000 adults



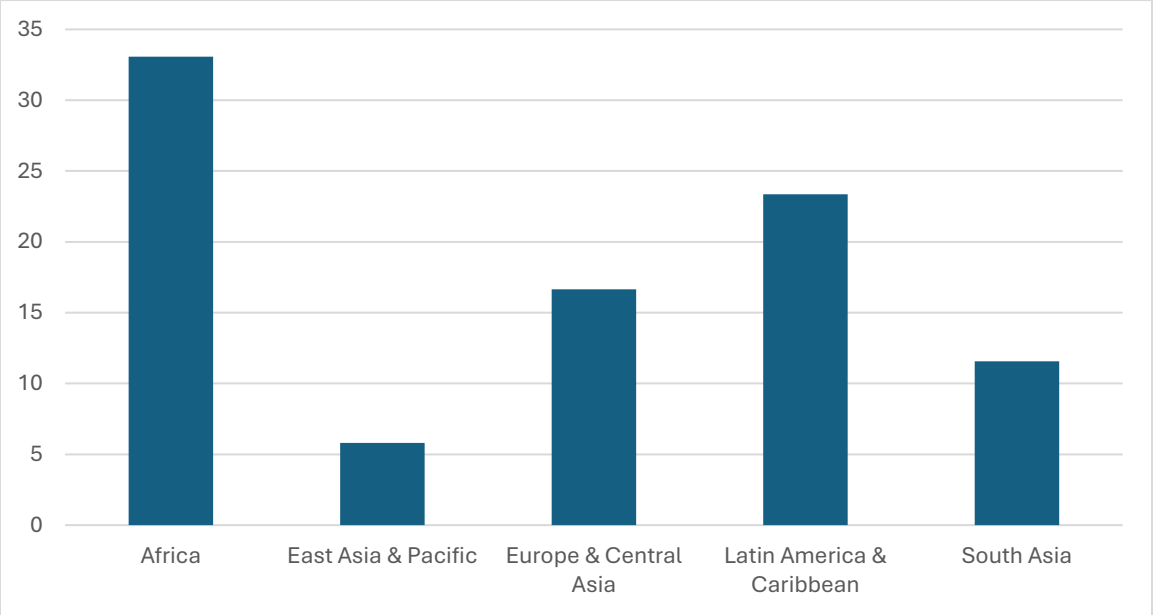
Source: Author's compilation from the World Bank (2024a) Global Findex Database 2021

Figure 2. 4: Percentage of adults with accounts at financial institutions



Source: Author's compilation from the World Bank (2024a) Global Findex Database 2021

Figure 2. 5: Percentage of adults with mobile money account



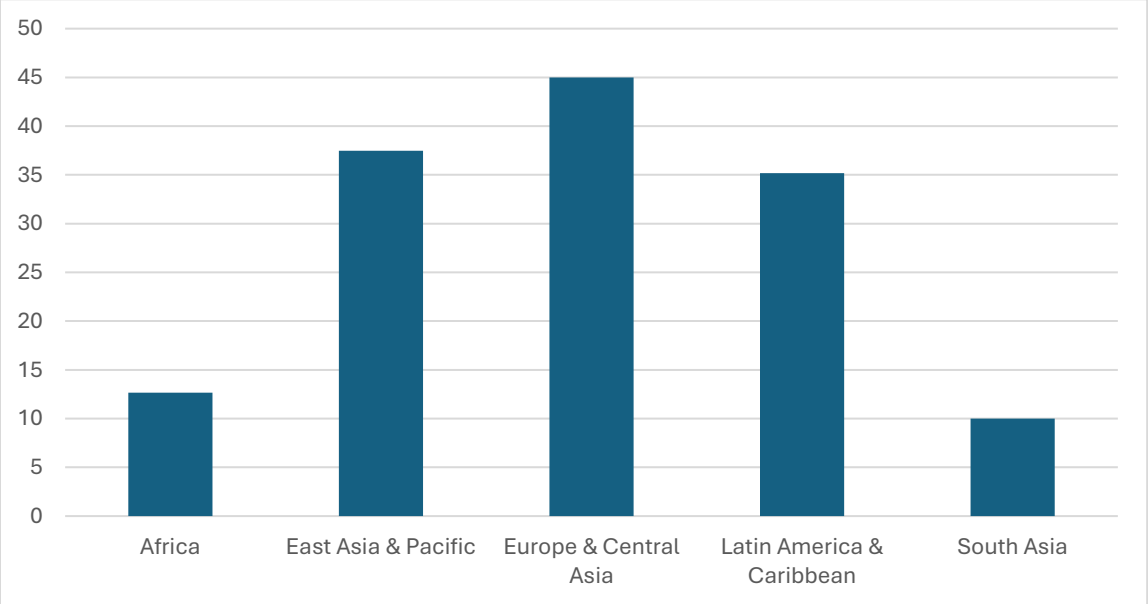
Source: Author's compilation from the World Bank (2024a) Global Findex Database 2021

Figures 2.2, 2.3, 2.4 and 2.5: financial access based on a percentage of adults who own debit cards, mobile money accounts, commercial banks and ATMs per 100,000 adults.

ii) Usage of Formal Financial Services and Products

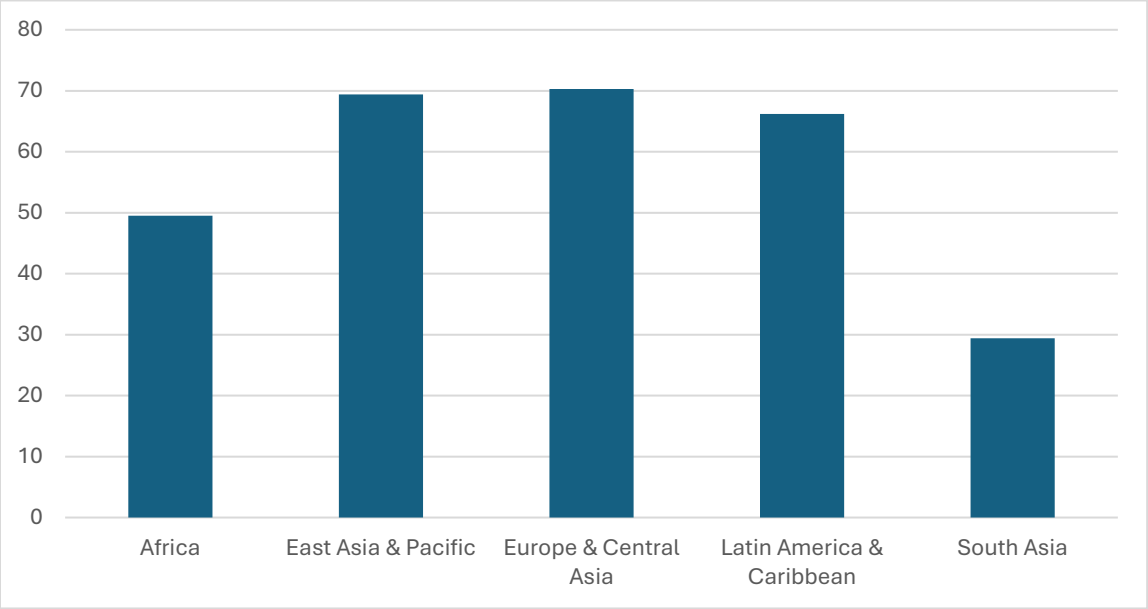
Figures 2.6, 2.7, 2.8 and 2.9 below present the different usage measures. In 2021, the use of financial services and products in Africa varied in comparison to other regions. Overall, 35 percent of adults globally reported using debit cards, with 65 percent reporting having deposited money at a formal financial institution. In comparison, only 29 percent and 28 percent, respectively, could save and borrow from financial institutions (World Bank, 2024a). The figures below show that Africa and South Asia have the lowest usage compared to other regions, with Africa showing slight improvement over South Asia across all the usage measures except for the percentage of adults who borrowed from financial institutions. For instance, in Figure 2.6, Africa was the second lowest region after South Asia, with only 13 percent of people using debit cards for transaction purposes, compared to only 10 percent in South Asia. At the same time, about 50 percent of African people reported making one or more deposits (performed through transferring money or cash deposits) to their accounts. In comparison, only 29 percent were reported to make deposits in South Asia, as shown in Figure 2.7. On the other hand, in Figures 2.8 and 2.9, Africa showed a low number of people who saved and borrowed money at a formal financial institution, with percentages of 12 and 9, respectively. In South Asia, approximately 11 percent of the population could save and borrow at a formal financial institution. In terms of the number of people who borrowed money at a formal financial institution, Africa had the lowest percentage.

Figure 2. 6: Adults who used debit cards (%)



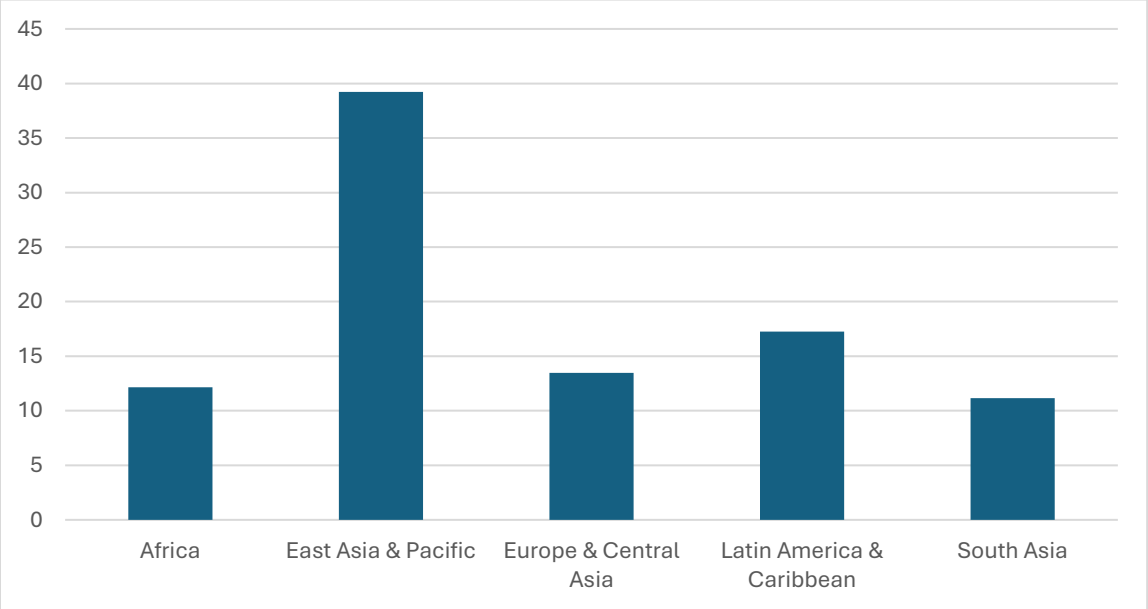
Source: Author's compilation from the World Bank (2024a) Global Findex Database 2021

Figure 2. 7: Adults who deposited money with formal banks (%)



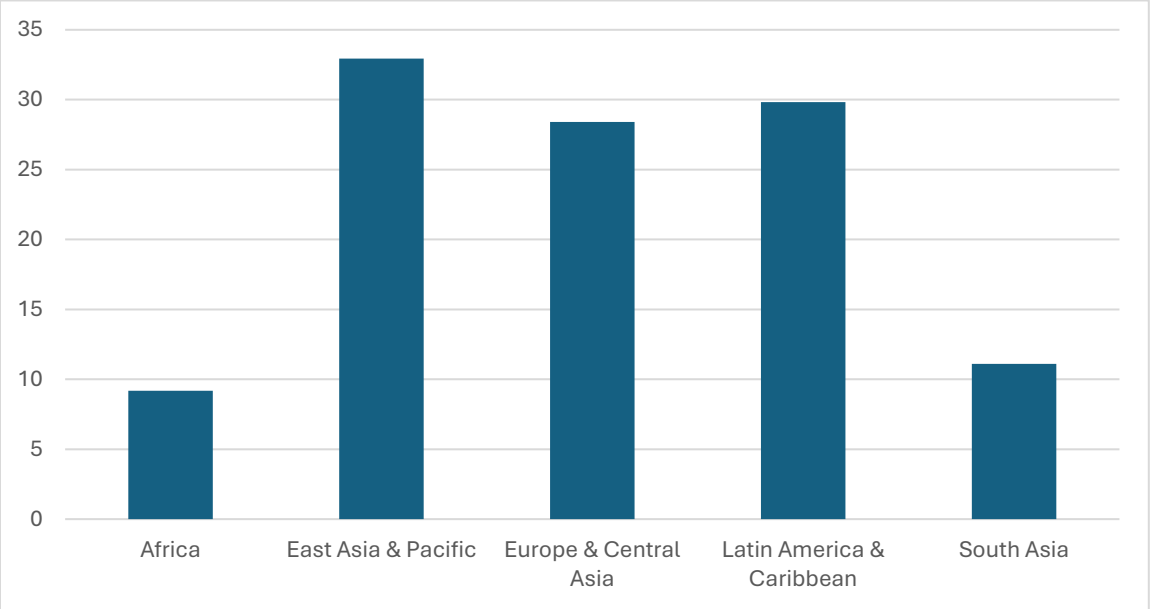
Source: Author's compilation from the World Bank (2024a) Global Findex Database 2021

Figure 2. 8: Adults who saved money with a formal commercial bank (%)



Source: Author's compilation from the World Bank (2024a) Global Findex Database 2021

Figure 2. 9: Adults who borrowed money from a formal financial institution (%)



Source: Author's compilation from the World Bank (2024a) Global Findex Database 2021

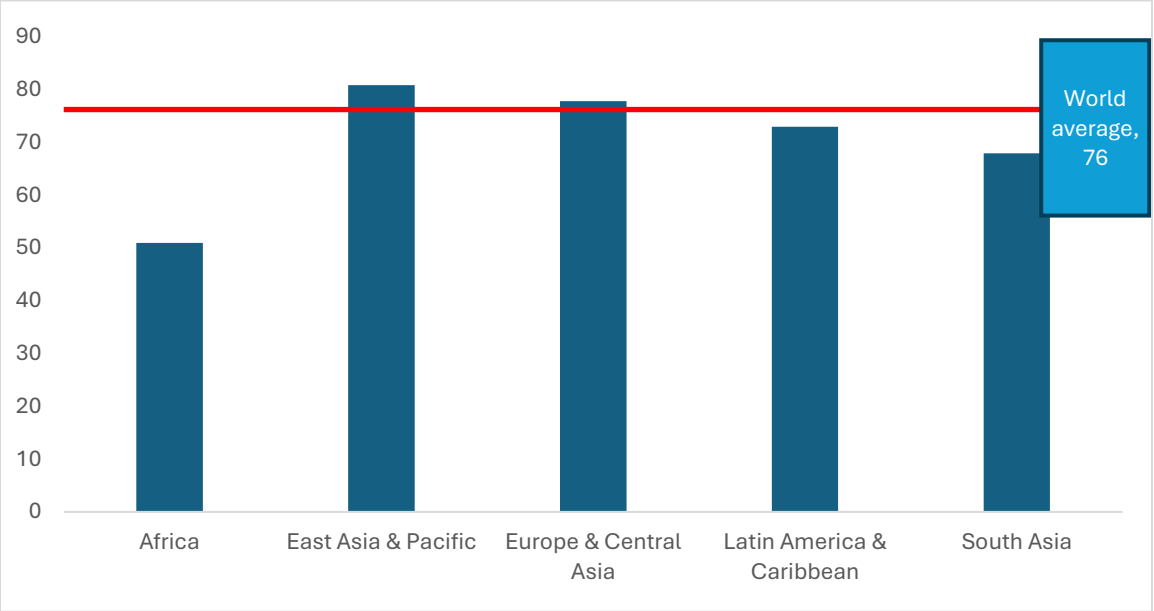
Figures 2.6, 2.7, 2.8 and 2.9: financial usage based on debit card ownership, deposits and savings made at formal banks, and money borrowed from formal banks in 2021.

According to the African Development Bank (2013), many Africans save through informal methods such as community savings clubs. This could be due to the lack of access to service points that enable people to create accounts and other factors such as distance. In addition, in Figure 2.9 above, Africa has the lowest percentage of people who can borrow money from a financial institution. Most people in Africa lack income; thus, borrowing from friends and relatives is the most common source across the subregions (African Development Bank, 2013).

iii) Penetration of Formal Financial Services and Products

According to the World Bank, global account ownership has increased over the past ten years, between 2011 and 2021 from 51 percent to 76 percent, while in Africa, adults who held an account at a formal financial institution increased from 23 percent to 51 percent in 2021 (World Bank, 2024a). This implies that the ownership of accounts has penetrated half of the population in Africa, which can be attributed to mobile money banking (Zins & Weill, 2016). Figure 2.10 shows the percentage of adults who hold an account at a formal financial institution in 2021.

Figure 2. 10: Percentage of adults with accounts at formal financial institutions in 2021



Source: Author's construct from World Bank (2024a) Global Findex Database 2021

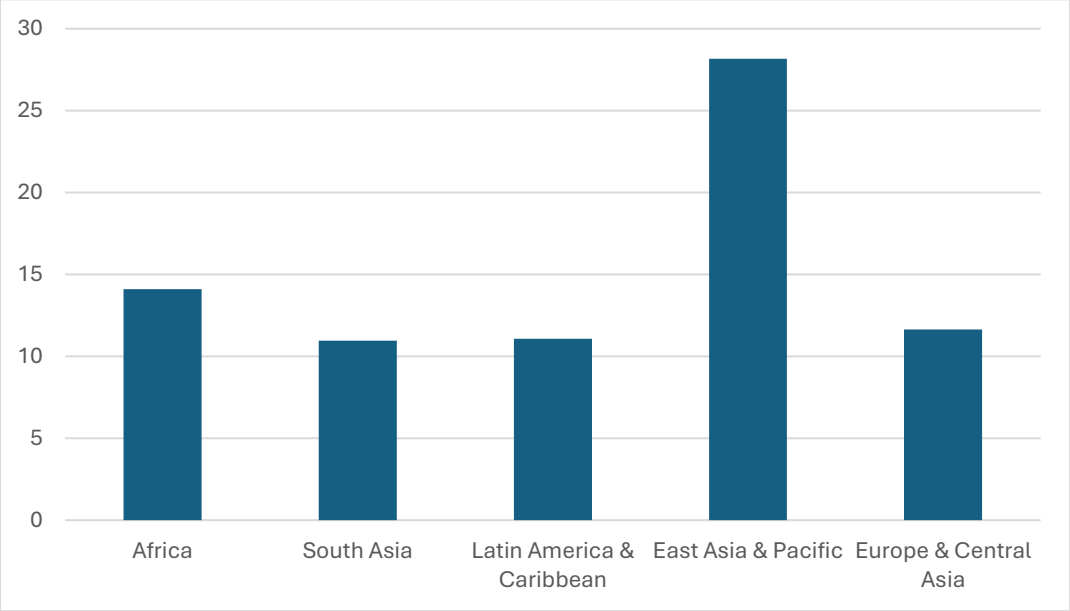
As shown in Figure 2.10 above, although showing an improvement in penetration through the improvement in ownership of accounts, Africa still has the lowest percentage of adults who hold an account at a formal financial institution. This percentage falls below the world average of 76 percent and is the lowest after South Asia, which has about 68 percent of its population owning accounts, indicating a high level of financial exclusion in Africa (World Bank, 2024a). It is worth noting that financial penetration in Africa may be low due to the development of the financial systems and the availability of the infrastructure (African Development Bank, 2013; Beck et al., 2023).

iv) Quality of Financial Services

According to the Global Partnership for Financial Inclusion (GPFI) (2016), financial inclusion is also characterised by the quality of financial services and products measured by financial knowledge, financial behaviour and disclosure requirements. Due to the availability of data, the study was able to source financial behaviour trends based on the use of savings for emergency funding. According to the World Bank, globally, only 24 percent of the adult population is able to finance emergencies using savings, while the East & Pacific region is above the world average and leading by approximately 28 percent. Africa and Europe & Central Asia follow at 14 percent and

12 percent respectively. While only 11 percent of adults used savings as emergency funds in Latin America and the Caribbean, and South Asia (World Bank, 2024a). Figure 2.11 provides the primary source of emergency funds in 30 days: savings in 2021.

Figure 2. 11: Percentage of adults using savings to fund emergency expenses in 2021



Source: Author's construct from World Bank (2024a) Global Findex Database

Although Africa has the second-highest percentage of savings used to finance emergencies, this is still relatively low. This implies that only 14 percent of the adult population is able to access emergency money within 30 days without much difficulty, while the majority of the population is more likely to depend on family and friends, an unreliable source (World Bank, 2024a).

2.5 Barriers to Financial Inclusion Development in Africa

Given the trend analysis discussion, it can be deduced that while Africa has made some progress in certain dimensions of financial inclusion, significant challenges remain in ensuring widespread access to and usage of financial services and products. The banking system in Africa continues to be less inclusive compared to other regions globally. This section shifts focus to explore the barriers to financial inclusion, aiming to contextualise the factors that have limited past efforts and to identify areas where further intervention is required. According to Zins and Weill (2016), financial exclusion can be attributed to several factors, including geographical distance, high costs

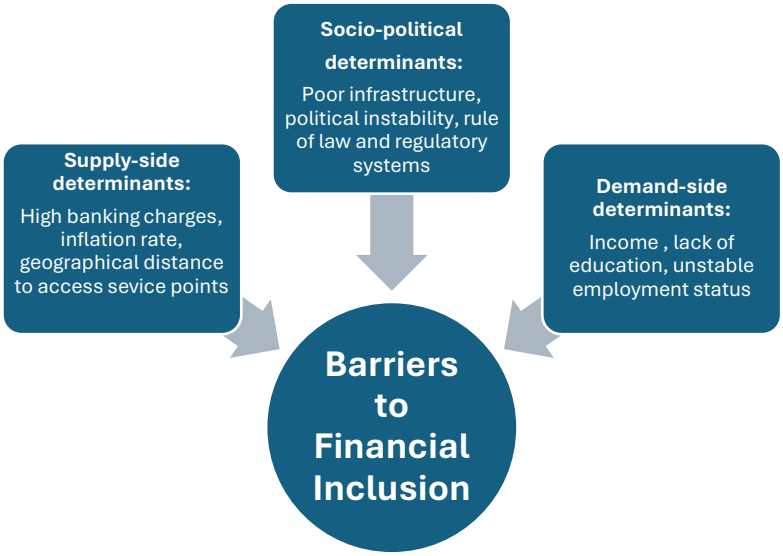
associated with financial services, lack of documentation and money, religious beliefs, and the presence of a family member who has an account.

African financial systems exhibit a dualistic structure consisting of both formal and informal systems. This duality arises from significant government intervention, which often leads to underdevelopment within the formal financial system. Formal banks, facing high operational costs, complicated procedures and poor management, struggle to provide accessible financial services and products. Consequently, many individuals and businesses turn to informal financial systems, which play a crucial role in increasing financial access in the medium term. In addition, a substantial number of countries that are listed as fragile states[6] by the OECD and the African Development Bank are located in Africa, especially in SSA. This region is also classified by the United Nations as one of the Least Developing Economies (African Development Bank, 2013).

Research by the African Development Bank (2013), Demirgüç-Kunt and Klapper (2012), and Nsiah and Tweneboah (2023) highlights several demand-side, supply-side and socio-political factors that perpetuate limited outreach and high levels of exclusion in Africa. These include low income levels, unstable employment status, inflation, lack of education (leading to financial illiteracy), poor infrastructure, governance issues (such as political instability and corruption), rule of law and regulations, lack of competition within the banking system, and high banking charges. The African Development Bank (2013) and Kempson and Whyley (1999) further emphasise that the most vulnerable groups to financial exclusion are the following: the poor, people who earn a low income or have no income (dependent on the state or family members), women, SMEs, rural areas, and previously disadvantaged ethnicities, including African-Caribbean, black, Pakistani, or Bangladeshi. These are diagrammatically represented in Figure 2.12 below.

[6] "Fragile state" countries are characterised by high poverty levels, high inequality, underdeveloped financial sector, lack of infrastructure and political instability (African Development Bank, 2013).

Figure 2. 12: Barriers to financial inclusion



Source: Author's own construct from the African Development Bank (2013), Demirgüç-Kunt and Klapper (2012), Kempson and Whyley (1999), Nsiah and Tweneboah (2023)

2.5.1 Demand-Side Barriers to Financial Inclusion

Concerning the demand-side factors, Kempson and Whyley (1999) suggested that lack of education (resulting from leaving school at an early age, leading to financial illiteracy) does not constrain financial access directly; it does so indirectly by exacerbating the likelihood of a low income. This suggestion is supported by the study of Williams, Grace, Ayodele, Olasupo and Aladejebi (2023), who found that illiteracy does not drive financial inclusion. Given the fixed and high costs of opening and maintaining bank accounts, low-income earners and poor people with no income stream cannot acquire bank accounts. As a result, they will not be able to participate in the financial sector. The reason is that having an account is an entry point into the formal financial sector (African Development Bank, 2013; Demirgüç-Kunt & Klapper, 2012). Nsiah and Tweneboah (2023) and Park and Mercado (2016) suggested that high income increases access to financial services and products. This is because a higher income leads to increased consumer demand in the economy. Thus, promoting business activity and expansion due to increased demand leads to job creation and more income and, as such, expands individuals' participation in the financial sector. This implies that low income leads to financial exclusion, as those with

insufficient income and high-risk profiles will be excluded from participating in the financial system.

The link between income and employment status makes unemployment a major constraint on providing and accessing formal financial services and products. This is specifically the case for rural residents, where the unemployment rate is extremely high compared to urban areas. (Lal, 2018; Williams et al., 2023). Those who are unemployed or underemployed tend to lack financial resources and access to and usage of financial services and products. The International Labour Organisation (ILO) (2020) and Williams et al. (2023) suggest that the COVID-19 pandemic has exacerbated the unemployment rate in rural areas globally, further limiting access to financial services and products.

2.5.2 Supply-Side Barriers to Financial Inclusion

Kempson and Whyley (1999) indicated that financial access and usage of financial services and products on the supply side also depend on geographical location and affordability. In the case of Africa, there is evidence of a low percentage of commercial lending that goes to agriculture and agribusinesses. At the same time, in 2013, less than 5 percent was invested in the agricultural sector, a portion of which would spill over to individuals living in rural communities (African Development Bank, 2013). In addition, based on the World Bank (2024a) Global Findex Database, the rural population is underbanked compared to urban areas across Africa. For example, based on country-level data, which paints a bleak picture, South Africa is recognised as one of Africa's most developed financial sectors. However, only 37 percent of rural residents reported saving money at a formal financial institution, while just 18 percent have reported borrowing from one. This is likely due to high poverty and low income levels among rural residents (African Development Bank, 2013). On the other hand, inflation affects financial inclusion through its negative influence on the incomes of poor people, eroding the purchasing power of money. Given fixed and expensive costs, low-income earners and poor people cannot access financial services and products at high inflation rates, as the purchasing power of their income is reduced (Ndoricimpa, 2017; Nsiah & Tweneboah, 2023).

2.5.3 Socio-Political Barriers to Financial Inclusion

Nsiah and Tweneboah (2023) and Williams et al. (2023) further explain that socio-political factors, including the rule of law, corruption control, regulatory systems, governance effectiveness, and political stability, also influence the inclusiveness of the financial system. This is because regulations and the rule of law have a double role in promoting financial inclusion. On the one hand, they reduce information asymmetry, enforce contracts and reduce costs associated with accessing and using financial services and products (Park & Mercado, 2016). This reduces adverse selection issues (Aluko & Ajayi, 2018). On the other hand, it restores trust in the financial system (Nutassey, Sibanda & Nomlala, 2023). Therefore, a poor quality institution, with weak enforcement of the contracts, poor regulations, corrupt tendencies, and political instability, could negatively affect financial inclusion by making people distrust the financial system and discourage them from frequently using financial services and products (Nutassey et al., 2023; Sohn, Lee & Kim, 2020).

2.6 Conclusion

This section provided a comprehensive review of the current state of financial inclusion in Africa. First, the study provided an overview of the financial system, particularly focusing on the banking system. It highlighted that the banking structure in Africa is primarily composed of central banks and deposit-taking institutions. Notably, there are approximately 809 commercial banks across the continent, the majority of which are foreign-owned banks. The shift towards foreign banks was motivated by the transition from government-owned banks to privatised entities. Consequently, foreign banks have come to dominate the banking industry in Africa. In addition, the study noted that Africa's financial system remains shallow, underdeveloped and less inclusive. This is evidenced by the region's low levels of indicators of financial development. A significant percentage of the population remains financially excluded, further exacerbating the system's exclusivity. Furthermore, the study revealed notable variations within the banking sector. While Southern and Northern Africa remain relatively developed with adequate capital and banking liquidity, subregions such as East and West Africa lag behind, offering basic financial services and lacking capital. Moreover, the study identified several underlying economic conditions that contribute to the underdevelopment, which are relevant to most African countries, if not all. These include governance challenges, volatility, the size of the economies and the informal sector.

Interestingly, the study found that the factors that contributed to the shallowness and underdevelopment of the banking system, such as limited global integration, fostered stability, resilience and profitability within the region. These conditions played an essential role in helping the continent survive the financial crisis of 2008 better than other regions, mainly due to the region's limited interconnectedness with the rest of the world.

Second, in section 2.3, the chapter provided an in-depth overview of international and national strategies aimed at promoting financial inclusion. The section began by defining financial inclusion and differentiated between voluntary and involuntary financial exclusion. It also highlighted the key factors perpetuating financial exclusion in Africa, such as high costs associated with opening and maintaining bank accounts, geographical distance, lack of income, lack of access to finance (such as credit), and lack of documentation. The discussion emphasised that the most vulnerable groups are women, SMEs, elderly people, young adults, and those residing in rural areas. In addition, the section discussed several initiatives from the World Bank, AFI and OECD. These initiatives included NFIS, achieving the Universal Financial Access by 2020 goal, the FIFS, the Maya Declarations, the Accords, and financial education programmes. These programmes focused on improving financial literacy, providing tailored training and offering guidance on personal finance management and risks associated with the financial system. Furthermore, the section explored national strategies to improve financial inclusion based on the NFIS framework developed by the World Bank and AFI. This framework was chosen because several countries have adopted the NFIS guidelines provided by these organisations and have maintained detailed documents that hold records of their implementation processes. By analysing these strategies, the chapter provided valuable insights into the efforts being made at both international and national levels to address financial exclusion and promote inclusive financial systems across Africa.

Third, the discussion on financial inclusion trends in section 2.4 revealed that, despite some progress in Africa, a significant portion of the population continues to face substantial challenges in accessing and using financial services and products. The banking system in Africa remains notably less inclusive compared to those in other regions. In section 2.5, the study outlined the factors that limit the development of inclusive financial systems. These barriers include the dualistic nature of the financial system, which comprises both the formal and informal sectors,

lack of income, high bank fees, distance, poor regulatory system and rule of law, poor infrastructure, high unemployment, high poverty, inequality, and an underdeveloped financial system. Addressing these challenges is crucial for fostering greater financial inclusion and ensuring that more individuals and businesses can benefit from formal financial services.

CHAPTER 3
INCOME INEQUALITY IN AFRICA

3.1 Introduction

This chapter provides an overview of income inequality in Africa, focusing on strategies to improve income distribution and its trends. From the 2000s to now, Africa has experienced steady economic progress, most of which was driven by the agricultural sector and, more recently, by services and industry sectors between 2010 and 2023 (Statista, 2024a). This economic progress was to address, among other things, unemployment and income inequality. However, the accelerated economic growth in Africa failed to create sustainable employment for low-income people, including women, youth, and rural residents (OECD, African Development Bank, UNECA and United Nations Development Programme (UNDP), 2011). Thus, living income distribution unscathed. To date, the region of Africa is well-known to have the highest income inequality, following Latin America and the Middle East (World Inequality Database, 2024). In Africa, the top 10 percent of income earners receive 53 percent of the national income, while less than 10 percent goes to the bottom 50 percent (World Inequality Database, 2024).

The income inequality in Africa arises from varying regional inequalities. For instance, Southern Africa is the most unequal sub-region after Central and West Africa. On the other hand, East and North Africa are the least unequal sub-regions, but are still relatively highly unequal when compared globally (Nel, 2018). At a country level, South Africa, Namibia, Eswatini, Botswana, Zambia, Angola, Mozambique, Zimbabwe, the Republic of Congo, Comoros and Lesotho are among the top 20 unequal countries in the world (Statista, 2024b). This disparity shows the dual nature of the pan-African income distribution, with a low-income share for the population at the bottom of earnings and a high-income share for the minority at the top, which might be due to the political and economic structures shaped by the colonial history (Chancel et al., 2019; Khan et al., 2022; World Inequality Database, 2024). As a result, the primary objective of economic policy in Africa has been to address income inequality within and between countries (Bicabaa, Brixiová & Ncube, 2017).

Given the above background, the chapter is structured into four sections. After the introduction, section 3.2 discusses international and national initiatives to reduce income inequality within and among countries. Section 3.3 presents a comparative analysis of income inequality trends across international regions and within Africa. Finally, section 3.4 concludes the chapter.

3.2 International and National Strategies to Improve Income Distribution

3.2.1 International Initiatives to Improve Income Distribution

Income[7] inequality[8] refers to how income is unevenly distributed among a population, indicating that the income gap between individuals is widening (Atkinson, 1970). The various measures of this variable include the widely used Gini coefficient (also known as the Gini index) and other indicators found in literature, such as the Palma ratio, the Theil index and the Atkinson index. Consequently, income inequality results from the unequal distribution of income within a specific population and how income is distributed among the various factors of production (Kakwani, 1980; Kebede et al., 2023; Shimeles & Nabassaga, 2018). Reducing income inequality is the main focus for several international organisations, each employing various initiatives. This is because income inequality derails economic progress as it constrains the efficient and equal use of resources and reduces the growth effect on poverty reduction (Alesina & Perotti, 1996; Batuo et al., 2021; Persson & Tabellini, 1994). This section discusses policies designed to improve income distribution internationally, mainly focusing on the strategies of the world's leading organisations, including the United Nations (UN) and the World Bank.

3.2.1.1 United Nations (UN) Strategy

Founded in 1945, the UN is a global political organisation that maintains peace and security and develops networking channels between nations to promote global co-operation and collaboration. The UN consists of 193 member states from worldwide regions (UN, 2024a). In a meeting held in New York in September 2015, the UN adopted 17 Global Goals, also known as the SDGs, as an international call to take action to end poverty, protect the planet, and ensure peace and prosperity

[7] Income is the gross or disposable income of households within a particular year. Gross income is income before all taxes and transfers, while disposable income is the income remaining after all taxes and transfers (Organisation for Economic Co-operation and Development (OECD), 2024b; World Inequality Database, 2024). It includes returns from factors of production such as rent, interest, and wages (Kakwani, 1980).

[8] The definition of income inequality is discussed further in Chapter 4 under the Theoretical review section.

by 2030 (UNDP, 2024). The 17 SGDs are associated with integrated and indivisible targets, recognising that action in one targeted area will affect outcomes in others, and that development must balance economic, social and environmental sustainability (UN, 2015b; UNDP, 2024). Among the goals, SDG 10 seeks to reduce inequality within and among countries. This goal includes various targets with their indicators, as shown in Table 3.1 below.

Table 3. 1: Sustainable Development Goal 10 targets and indicators

	Target by 2030	**Indicators**
10.1	• Progressively achieve and sustain income growth of the bottom 40 percent of the population at a rate higher than the national average.	• Growth rates of household expenditure among the bottom 40 percent of the population and the total population. • Income per capita among the bottom 40 percent of the population and the total population.
10.2	• Empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion, or economic or other status.	• The proportion of people living below 50 percent of the median income by gender. • The proportion of people living below 50 percent of the median income by age. • The proportion of people with disabilities living below 50 percent of the median income.
10.3	• Ensure equal opportunity and reduce inequalities in outcomes by eliminating discriminatory laws, policies, and practices and promoting appropriate legislation, policies, and action in this regard.	• The percentage of individuals who reported experiencing discrimination or harassment in the past 12 months based on the grounds prohibited under international human rights law.
10.4	• Adopt fiscal, wage and social protection policies and progressively achieve greater equality.	• Labour share of GDP. • Redistributive impact of fiscal policy.
10.5	• Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations.	• Financial soundness indicators.
10.6	• Ensure enhanced representation and voice for developing countries in global international economic and financial institutions' decision-making to deliver more effective, credible, accountable, and legitimate institutions.	• The percentage of members and voting rights of developing countries in international organisations.
10.7	• Facilitate orderly, safe, regular and responsible migration and mobility of people, including implementing planned and well-managed migration policies.	• Employees bear recruitment costs as a proportion of monthly income earned in the country of destination. • The number of countries with migration policies that facilitate orderly, safe, regular and responsible migration and mobility of people. • The number of people who died or disappeared in the migration towards an international destination. • The proportion of the population of refugees by country of origin.
10.a	• Implement the special and differential treatment principles for developing countries, particularly least developed countries, according to the World Trade Organisation agreements.	• The percentage of tariff lines applied to imports from least developed and developing countries with zero tariffs.

10.b	• Encourage official development assistance and financial flows, including foreign direct investment, to states where the need is greatest, mainly least developed countries, African countries, small island developing states and landlocked developing countries, by their national plans and programmes.	• Total resource flows for development by recipient and donor countries and types of flow (e.g. official development assistance, foreign direct investment and other flows).
10.c	• Reduce to less than 3 percent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 percent.	• Remittance costs as a proportion of the amount remitted.

Source: Created by author from UN (2015b); UN (2024b)

3.2.1.2 The World Bank Strategy

Advancing shared prosperity is one of the goals of the World Bank Group because high income inequality may signal a lack of social mobility, which impedes inclusive growth over time (World Bank Group, 2024b). The World Bank has introduced various policies to address income inequality, focusing on emerging and developing countries. This effort is driven by the global evidence of high income inequality (World Inequality Report, 2022a), with a high degree of concentration among economies in Africa, Latin America and the Caribbean (World Bank Group, 2024b). These frameworks include the Social Protection and Labour Strategy 2012-2022 and the Shared Prosperity Strategy, which serve as mechanisms to improve shared prosperity.

The Social Protection and Labour Strategy Framework 2012-2022 aims to enhance resilience, equity and opportunity for low and middle-income economies by committing to extend social protection and labour programmes. Its goal is to achieve equity by emphasising the building of inclusive, adaptive and resilient economies that assist people, specifically marginalised individuals, to have access to opportunities to build and protect human capital, enhance employability, benefit from earning opportunities, manage financial risks arising from the economic crisis, and enhance growth in social mobility, thereby addressing the root cause of inequality. To reach this goal, it proposed programmes to enhance social protection, including social safety net programmes such as cash transfers, pension and unemployment grants, and labour market programmes, including skills building and job search programmes (World Bank, 2012c).

Additionally, one of the key goals of the World Bank Group is to promote shared prosperity, which reflects the extent to which economic growth is inclusive (World Bank Group, 2013). The World

Bank has embarked on a Shared Prosperity Initiative to enhance shared prosperity by boosting the earnings of the bottom 40 percent of people in each country (World Bank, 2018). This initiative provides a policy framework that emphasises investing in the human capital needed to build a dynamic workforce and encourages growth patterns to be inclusive and improve and create equal opportunities for everyone, mainly impoverished and marginalised people (World Bank Group, 2013). These strategies, specifically focusing on employment creation and investment in human capital, provide a framework to reduce inequality and facilitate social and economic stability (World Bank, 2018).

3.2.2 National Initiative to Improve Income Distribution

Given the statistical evidence of high income inequality in Africa and its harmful effect on economic growth and poverty reduction (Dabla-Norris et al., 2015; World Inequality Database, 2024), the African nations have focused on improving income distribution by following frameworks from international organisations, such as the UN and the World Bank, addressing this significant challenge (African Development Bank, 2012; Chancel et al., 2019). This section presents Table 3.2, which summarises the national policy frameworks developed by 18 African countries included in the study in line with UN and World Bank policy suggestions.

Table 3. 2: National strategies to reduce income inequality

Country	Strategy	Aim	References
Algeria	• National Fund for Social Insurance	• To ensure employees in agricultural and non-agricultural activities in the private and public sectors, as well as students and civil servants. • To provide insurance against old age, work-related injuries, medical leave, and family assistance.	• Kanaan (1997)
	• Pension Fund	• To provide pensions to the National Fund for Social Insurance members and other social and family benefits for pensioners. • To provide direct financial assistance to the handicapped, the elderly and the mujahideen.	
	• Government financial assistance	• To assist young people who are seeking employment for the first time. • To help those who have been laid off to establish their own businesses.	
	• Employment programme	• To encourage the establishment of cooperatives, small businesses, community-based public works and training programmes. • To target those between the ages of 19 and 40.	
Botswana	• Feeding programmes • Cash and near-cash programmes • Food packages, feeding schemes • Fee waivers • Sponsorships and scholarship programmes • Public works programme (Ipelegeng of 2008)	• To respond to the needs of orphans and vulnerable people, including those for food, clothing, shelter, education, protection, and care. • The scholarship programmes focus on human capital accumulation and skills development.	• World Bank (2013d) • World Bank (2022b)
	• Employment creation programmes	• These programmes mainly provide financial assistance to the poor, vulnerable groups.	
	• Youth Development Fund • National Internship programme • Graduate Volunteer Scheme (GVS) • Management and Infrastructure Development (LIMID) programme	• These programmes mainly help the youth acquire labour skills, market experience, business knowledge, capital, and other inputs.	
Burundi	• Merankabandi-cash transfer programme	• To provide regular cash transfers to extremely poor and vulnerable households with children in selected areas.	• United Nations Children's Fund (2022) • World Bank (2019)

		• To strengthen the delivery mechanisms for developing a basic social safety net system.	
Cameroon	• School feeding programmes	• To focus on providing nutritional support to students to improve the educational attainment levels of girls in target geographic zones.	• Ninno & Tamiru (2012)
	• Public Works Programmes: -*Cash for work* -*Food for work*	• To provide cleaning jobs and food to beneficiaries in the city.	
	• Direct Cash Transfers	• To assist abandoned and street children, handicapped individuals, the elderly, and vulnerable cultural minority groups in the country.	
Congo Republic	• Lisungi Safety Nets System Project	• The programme targets the country's most vulnerable households. • To provide conditional cash transfers and cash for income-generating activities.	• World Bank (2013e)
Egypt	• Food security programmes	• To provide food subsidies (Baladi bread and Ration Cards) to vulnerable groups.	• Ameta, D. & El-Shafie (2015)
	• Conditional Cash Transfers	• To develop an integrated approach to social welfare that involves health, education, housing, water and job creation, especially for the youth.	
	• Social Fund for Development	• To create employment opportunities. • To build the capacity of communities by improving their access to basic services. • To fund medium- and small-sized enterprises.	
Eswatini	• Neighborhood care points	• Includes community-based centres to provide free cooked meals (and basic early childcare and development services) to needy, young, orphaned and vulnerable children.	• Raju & Younger (2021)
	• The government's school feeding programme	• To provide lunches for government primary, secondary, and high school students.	
	• Orphaned and vulnerable children (OVC) education grants	• To subsidise tuition and exam fees for orphaned and vulnerable children attending government secondary and high schools.	
	• Elderly grants	• To provide regular cash benefits to those aged 60 and above.	

Gambia	• School feeding Programme	• To ensure that children from low-income households, particularly in rural areas, have access to nutritious meals during school hours.	• United Nations Development Programme (2013)
	• The Cash Transfer	• To provide direct cash transfers to low-income households.	
	• Family Strengthening Project	• To ensure self-sustainability and assist people in building resilience to future shocks through its focus on income generation and asset accumulation.	
	• Development of assets and infrastructure	• To enhance income generation, mainly concerning agriculture and enterprise development, which provides skills and business management training and access to microfinance.	
Kenya	• The Cash Transfer for Orphans and Vulnerable Children • Disabilities Cash Transfer • The Older Person's Cash Transfer • The Urban Food Subsidy Cash Transfer • The Hunger Safety Net Programme	• Used as income support to the poorest and most vulnerable households.	• World Bank (2013f)
Madagascar	• Regular cash transfer programme	• To provide finances for families with children under 12 and conditional on primary school attendance with a UNICEF-funded top-up for children transitioning to secondary school.	• International Monetary Fund (2023)
	• A productive safety net programme	• To provide cash for work opportunities over a minimum of three years for workers assessed as poor in select districts. • To provide an unconditional transfer component in favour of vulnerable persons who cannot work due to disabilities.	•
Mauritius	• The tax-financed universal pension	• Basic income security for elderly people.	• United Nations (2021)
	• Unemployment benefits	• A tax-financed means-tested benefit for low-income workers not enrolled in social insurance and a higher rate benefit.	•
	• Social Aid Benefits	• Are paid to people with disabilities, widows, abandoned women, and certain other persons considered "vulnerable" if their incomes fall below a defined level.	•

Morocco	• Unemployment benefits	• To provide scholarships for vocational training and higher education for the unskilled working age population.	• Hajji, Abidine, Bouhmala & Chtaoui (2024)
	• The basic pension schemes for elderly people	• To provide an awareness campaign for the general public on solidarity with isolated people and the risks associated with old age. • To provide support and care services for those in difficult situations.	
Mozambique	• Direct Social Action	• These are transfer programmes for the poor and vulnerable who are unable to work, • To provide short-term, in-kind transfers in response to temporary vulnerabilities and other social welfare services.	• Marques (2012)
	• Education Social Action: -*School feeding*	• Aim to facilitate access to basic education by providing food in schools.	
	• Productive Social Action	• To increase access to income-generating opportunities for the poor and vulnerable who can work through employment • To increase livelihood interventions, including public works and social funds.	
Namibia	• Means-tested cash transfers: -*Basic social grants* -*Disability grants* -*Foster grants*	• To provide cashflow to old age, differently abled and childcare.	• Bank of Namibia (2013)
	• Labour market-linked transfers: -*Food-for-work programmes*	• To help unskilled gain useful experience that helps improve their future labour market outcomes. • In some cases, the food may be available but is unaffordable.	
	• Feeding schemes	• To provide meals in primary and preprimary schools and cover private and informal hostels.	
Rwanda	• Vision 2020 Umurenge Programme (VUP): -*Direct Support* -*Public Works*	• To the poorest households unable to supply labour. • To support extremely poor landless families with under-employed adults by creating	• World Bank (2012d)

		employment opportunities, encouraging saving and developing productive activities.	
	• Financial Services	• To facilitate investment in income generation and entrepreneurial activities, sensitisation, and skills development.	
South Africa	• South African Social Security Agency (SASSA): -*Care Dependency Grant* -*Child Support Grant* -*Disability Grant* -*Foster Child Grant* -*Grant-In-Aid* -*Older Persons' Grant* -*Social Relief of Distress* -*War Veterans' Grant*	• To distribute social security services to vulnerable people, including old and disabled people and children.	• Statistics South Africa (2019) • World Bank (2021a)
	• National Minimum Wage Bill	• To protect low-earning workers and provide a platform for reducing inequality in society. • To decrease considerable disparities in income in the national labour market.	
	• Expanded Public Works Programme	• To create short-term employment for the unskilled labour force.	
	• Unemployment Insurance Contribution (UIF)	• To provide short-term relief to workers when they become unemployed or are unable to work due to illness, maternity or adoption leave. • To provide short-term relief to workers when they cannot work due to illness, maternity or adoption leave. • To provide support to the dependents of a deceased contributor.	
	• Pension Fund Act	• To provide a retirement benefit, either as a lump sum or a regular monthly income (or both), to a member who reaches retirement age.	
	• Broad-Based Black Economic Empowerment programme	• To advance economic transformation. • To enhance the economic participation of black people in the South African economy. • To improve human resources and development skills.	

		• To achieve equitable representation in all occupational categories and levels in the workforce.	
Tanzania	• Public Works Programme: -*Seasonal transfer*	• A seasonal transfer linked to participation in labour-intensive public works to increase and sustain household assets and smooth consumption during lean seasons.	• World Bank (2012b)
	• Variable Conditional Cash Transfer	• To encourage households with children or pregnant women to invest in their children's education and the health of pregnant women, participants must comply with a set of specific activities.	
	• Basic monthly transfer	• To improve household consumption on an ongoing basis, transferred to all households registered in the programme.	
Uganda	• Public service pension schemes	• To provide cash flow to retired civil servants.	• Ministry of Gender, Labour and Social Development (2015) • Ministry of Education and Sports (2022)
	• National Social Security Fund	• To provide cash flow to employees who work in small formal firms (minimum of 5 workers).	
	• Social Security Fund-Social Assistance grant for empowerment: -*Senior Citizens Grant* -*Vulnerable Family Grant*	• To provide income support to older and vulnerable households.	
	• Public works programme: Northern Uganda Social Action Fund (NUSAF) • The Karamoja Livelihoods Improvement Programme • Community-Driven Development Programme • Agricultural Livelihoods Recovery Programme	• To create community assets, provide food to households affected by famine. • To transfer cash to poor households with labour capacity.	
	• Skilling Uganda Strategic Plan (2012/13-2021/22)	• To increase the quality of skills. • To provide equitable access to skills development.	

Source: Compiled by the author based on the sources listed in the reference column

3.3 Income Inequality Trends

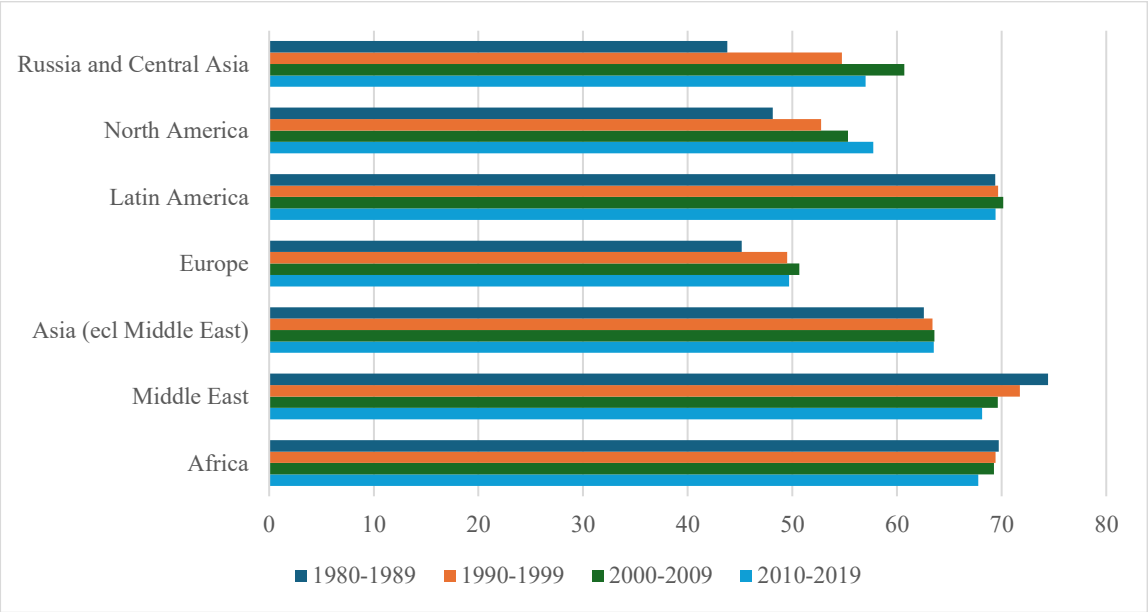
Building on the discussion of international and national initiatives aimed at improving income distribution, this section shifts focus to analyse the actual trends in income inequality over time. It explores the broader patterns of income inequality across different contexts. By analysing these trends, the section aims to provide a clearer understanding of the progress made and the challenges that remain in addressing income disparities.

3.3.1 Comparison of Income Inequality Trends Across International Regions

This subsection delves into a comparative analysis of how income inequality has evolved across various global regions. It highlights the differing trajectories of income inequality in different regions, offering insights into the effectiveness of initiatives and the persistent regional disparities. This comparison helps contextualise the successes and limitations of past efforts while identifying areas where further action is needed. For instance, Figure 3.1 below shows changes in the level of income inequality across international regions over ten-year intervals from 1980 to 2019. Based on this figure, the Middle East is the most unequal region, with an average Gini coefficient of 74 and 72 during the 20-year period between 1980 and 1999, but it shows a downward trend of income inequality. Latin America is the second most unequal, with an average of 69 and 70 during the 20-year period between 1980 and 1999, with the inequality not reducing. On the other hand, Europe is the least unequal among the regions. However, income inequality worsened, increasing from an average Gini coefficient of 45 between 1980 and 1989 to an average of 50 between 2010 and 2019.

In the case of Africa, the figure illustrates that while Africa is the third most unequal region globally, income inequality has been slightly decreasing, but remains above 65. Between 1980 and 1989, Africa had an average Gini coefficient of 70, indicating a high level of income inequality. However, this trend improved from 1990 to 2019, with the average Gini coefficient gradually decreasing to 68 by the end of that period. This slight decline in income inequality can be attributed to the policy interventions discussed in Table 3.2, which various countries put in place to mitigate the issue.

Figure 3. 1: Changes in the level of income inequality across the regions of the world over ten-year intervals from 1980 to 2019



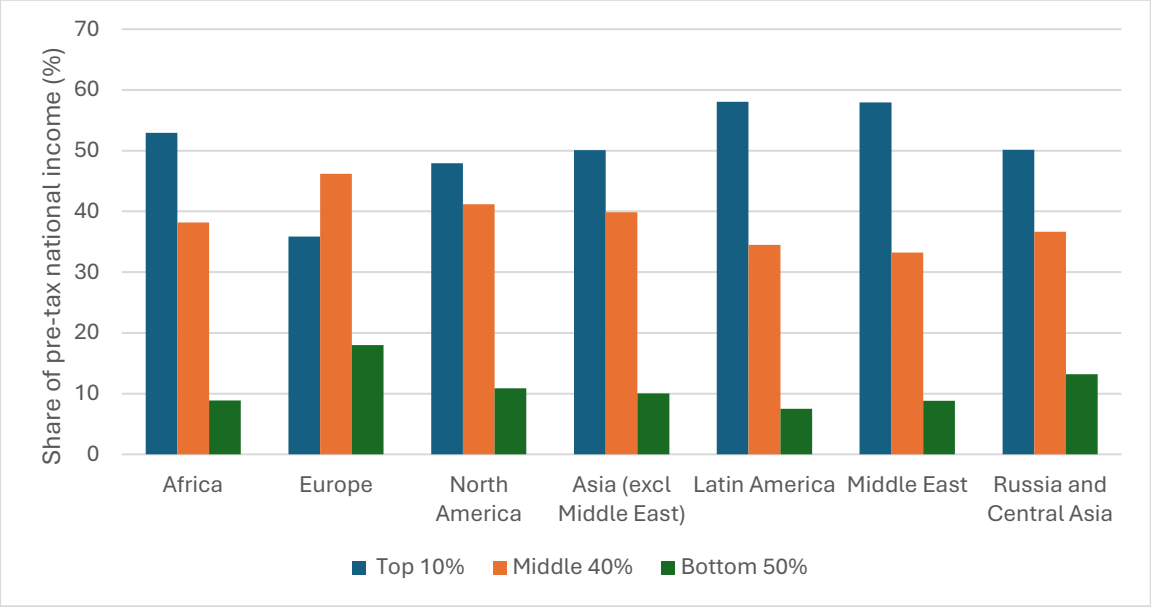
Source: Author's compilation from World Inequality Database (2024)

Figure 3.2 below shows the share of national income across the regions in terms of the income share held by the wealthiest 10 percent (top 10%), the middle 40 percent income earners (middle 40%) and the bottom 50 percent of low-income earners (bottom 50%) (World Inequality Report, 2022b; World Bank Group, 2025b). In 2022, Latin America and the Middle East were the most unequal regions in the world. In these regions, the wealthiest 10 percent received 58 percent of the national income, with 40 and 35 percent respectively going to middle-income earners. Only 10 and 7 percent respectively of the national income was distributed to the bottom 50 percent of low-income earners. On the other hand, Europe is the least unequal among the regions, with the top 10 percent receiving 36 percent of the national income. The middle 40 percent of the population receives a significant share of 46 percent, and the bottom 50 percent of the population receives 18 percent of the national income. This is by far the region with the fairest distribution of income compared to other regions.

Africa, on the one hand, is the third most unequal region in the world, after Latin America and the Middle East. In 2022, a significant portion of about 53 percent of the national income was distributed to the wealthiest 10 percent. The middle 40 percent of the population received 38 percent, while the bottom 50 percent of the population only received about 9 percent of the national income. This inequality shows the dual nature of the pan-African income distribution,

with a low-income share for the population at the bottom of earnings and a high-income share for the minority at the top.

Figure 3. 2: The level of income inequality across the regions of the world in 2022



Source: Author's compilation from the World Inequality Database (2024)

According to the history of Africa, high income inequality is rooted in the colonial era, which has left a lasting impact on the region (Angeles, 2007; Nel, 2018; Van de Walle, 2009). Colonialism occurred primarily through white settler and peasant colonialism, which had a substantial presence in the SSA region compared to the Northern part of the continent (Nel, 2018). The colonial system has left a lasting footprint, embedding income inequality within the structure of the African economic system. This inequality arose from the introduction of institutional structures that favoured the white classes rather than the African population, which gave them political influence and more access to economic opportunities (Angeles, 2007).

These institutional structures included:

i) An education system that excluded African culture, distorted the existing education system and did not promote industrial development (Angeles, 2007).

ii) The colonial political influence provided better income opportunities, allowing access to investment returns from education and healthcare. This influence enabled them to secure higher-paying jobs than the local Africans (Tadei, 2024).

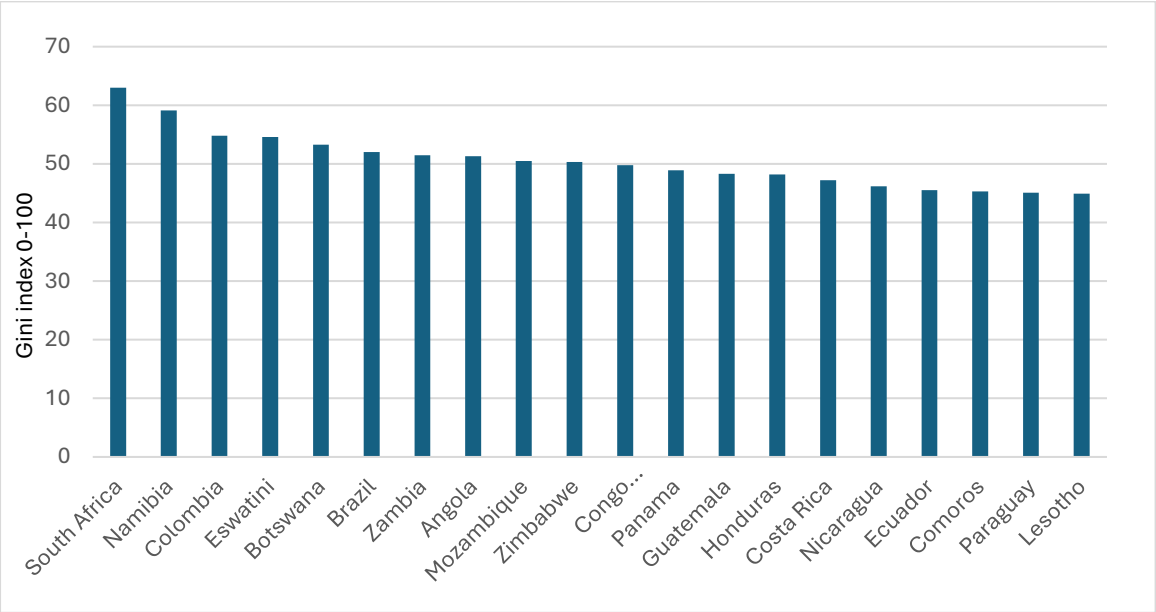
iii) Labour market dualism, where the colonialists worked in the urban sector (colonial administration), paying high salaries. In contrast, the majority of the African

population worked in the agricultural industry or were self-employed and earned low wages (Tadei, 2024).

In addition, the slow pace in the reduction of income inequality can be attributed to post-colonial factors arising from macroeconomic and political instability, the role of government, less skilled labour force, weak institutions, low human capital and poor health care (Alesina & Perotti, 1996; Alesina & Rodrik, 1994; Batuo et al., 2021; Keefer & Knack, 2002; Persson & Tabellini, 1994). These include ongoing governance and institutional challenges in various countries that reduce the availability of fiscal space necessary for implementing and enforcing social policies aimed at supporting the most vulnerable populations (Bhorat et al., 2016). Moreover, a lack of transformation and adaptability and insufficient industrialisation are among the factors that contribute to this slow decline in income inequality (Nissanke & Thorbecke, 2007; Yeboua, 2024).

Figure 3.3 below shows African countries that make up the top 20 countries with the highest income disparities in the world based on the Gini index in 2023. African countries make up 11 of these countries. These are South Africa, Namibia, Eswatini, Botswana, Zambia, Angola, Mozambique, Zimbabwe, the Republic of Congo, Comoros and Lesotho. This group of nations is defined primarily by a significant imbalance in income distribution, which might be due to the political and economic structures shaped by colonial history (African Development Bank, 2012; Chancel et al., 2019; Khan et al., 2022). In addition, this phenomenon is specifically evident in resource-rich countries such as South Africa and Botswana, highlighting the complex association between natural resource wealth and economic inequality. In these economies, the availability of abundant natural resources has not translated into equal distribution, revealing the complex role played by socio-economic factors, including macroeconomic, institutional and structural on income inequality (Saoudi & Louis-Sarbib, 2023).

Figure 3. 3: African countries that make up the top 20 countries with the highest income disparities in the world based on the Gini index in 2023



Source: Statista (2024c)

3.3.2 Comparison of Income Inequality Trends Within Africa

This subsection narrows the focus to Africa, a continent characterised by diverse economic structures and varying levels of development. It explores the trends in income inequality within African countries, highlighting subregional disparities and the unique factors influencing inequality in different subregions, such as North Africa and SSA. By comparing these trends, the analysis sheds light on the effectiveness of national and regional policies in addressing income inequality and identifies the persistent challenges that hinder equitable income distribution across the continent. This exploration provides a deeper understanding of the complexities of income inequality within Africa and underscores the need for tailored solutions to address its root causes.

Figure 3.4 shows income disparities within Africa. As shown in this figure, there has been a gradual improvement in the distribution of income, with periods of downswing and upswing from 1980 to 2022. Although income inequality is slightly reduced, it is still high, according to international comparisons. In 1980, Africa recorded a high Gini coefficient of 70, which decreased to 67.7 by 2011. In 2012, the Gini coefficient increased slightly to 68.3, but a downward trend resumed from 2014 to 2020, with the Gini coefficient ranging from 67.7 to 67.0, respectively. However, in 2022, the coefficient slightly increased again to 67.4.

Figure 3.5 presents income inequality across Africa, comparing all countries with a subset excluding the top 11 most unequal countries. This comparison uses 10-year averages from 1980 to 2019. The figure exhibits a downward trend in income inequality for both the entire group of countries and the subset excluding the top 11 most unequal countries. When examining all countries, income inequality is extremely high. However, this level improves when the most unequal countries are excluded. For instance, for the 30 years starting from 1980 to 2009, the level of income inequality is approximately 70, 69 and 69 when all countries are included, and it reduces to 68 between 2010 and 2019. However, it declines significantly when the top 11 most unequal countries are excluded. For instance, for the 20 years starting from 1980 to 1999, the level of income inequality is approximately 61 for both decades, which reduces to 60 and 59 over the 20 years from 2000 to 2019. The extreme income inequality in Africa may be fuelled by income inequality within countries, specifically the top 11 most unequal countries, with the highly unequal countries situated in Southern and Central (Middle) Africa (Statista, 2024c).

Given the discussion based on Figure 3.5, it can be deduced that there are varying income disparities within the subregions that are contributing to the overall high inequality. Figures 3.6 and 3.7 provide a subregional comparison over 10-year intervals from 1980 to 2019 and for the year 2022. According to these figures, the Southern African subregion is highly unequal (followed by Central, West and East Africa) with no clear improvement. For the 20 years from 1980 to 1999, the level of income inequality was approximately 68 in both decades, while it decreased to 67 in the decades between 2000 and 2019. At the same time, in 2022, inequality worsened with a Gini coefficient of around 75. Central Africa is the second most unequal subregion, showing a slight decrease over 40 years, followed by West Africa, which shows a significant improvement in the distribution of income, as it decreases over 40 years. In East Africa, income inequality slightly increases and decreases between 2000 and 2019. These subregions are showing a downward trend in income inequality. On the other hand, North Africa is the least unequal subregion, showing an improvement in the distribution of income. In the case of North Africa, income inequality gradually decreased over the 40-year period between 1980 and 2019, from 59 to 58, 57 and 54. However, in 2022, inequality increased to a Gini coefficient of 60.

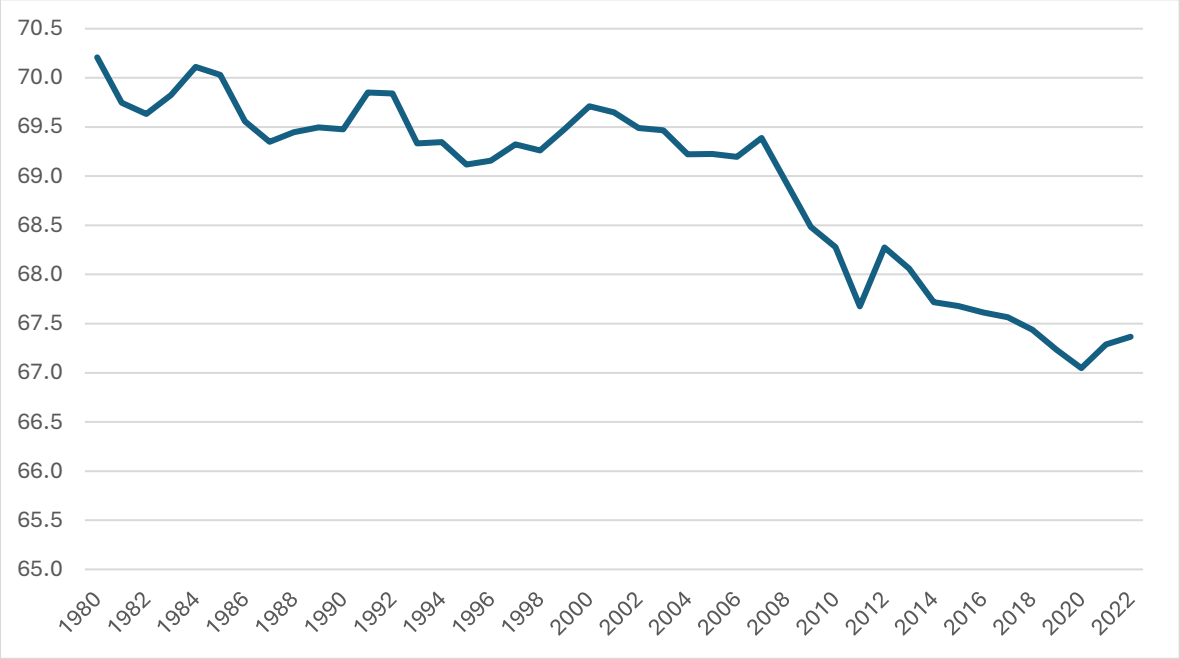
The variability in income inequality across Africa, as depicted in the trend analysis above, reflects the legacy of the colonial experience (Nel, 2018). For example, the extreme disparities

evident in the Southern subregion compared to Central, West, East, and Northern Africa may be rooted in historical colonial practices. Settler colonialism was particularly prominent in the Southern subregion due to access to marine routes for shipping goods and, later, the discovery of valuable resources such as land and gold in countries like South Africa, Zambia, and Zimbabwe. European settlers flocked to this subregion in unprecedented numbers compared to other parts of Africa. They utilised the legal and coercive power of the European state to gain extensive control over these key resources. With their significant numbers and access to power, these settlers established institutions that reflected the social, labour, and land-market systems of their home countries. They maintained monopolistic control over the legal system, thereby restricting the indigenous population's access to these institutions. This ultimately led to an unequal distribution of wealth and economic resources (Nel, 2018). Then, the Central, East and West African subregions exhibit lower disparities than the Southern subregion because a small fraction of the population occupied Central, East and West Africa due to the low availability of natural resources, being landlocked, and the tropical climate discouraging large populations of settlers (Nel, 2018).

The Northern subregion has low income inequality, but it is still considered high when compared internationally. This low level of income inequality can be attributed to the rising middle class, which has contributed to an increase in the real gross domestic product (GDP) per capita (Ncube, Anyanwu & Hausken, 2013). However, there remain significant income disparities, as the wealthiest 10 percent of the population earn approximately 57 percent of the national income, while the lower 50 percent only earns about 9 percent (World Inequality Database, 2023a). These subregional differences indicate that some countries are more unequal than others. Even when the top 11 most unequal countries are excluded from the African sample, income inequality remains high. In addition, beyond the colonial era, income inequality persists because a minority of the European population remains with most of the wealth. At the same time, they transferred only a small fraction of wealth to the African population upon liberalisation. Moreover, ongoing governance and institutional challenges in various countries reduce the availability of fiscal space necessary for implementing and enforcing social policies that support the most vulnerable populations (Bhorat et al., 2016). Additionally, a lack of transformation and adaptability (Nissanke & Thorbecke, 2007) and insufficient industrialisation (Yeboua, 2024) are among the factors exacerbating income inequality. Figures 3.4, 3.5, 3.6 and 3.7 present the trends in income inequality in Africa,

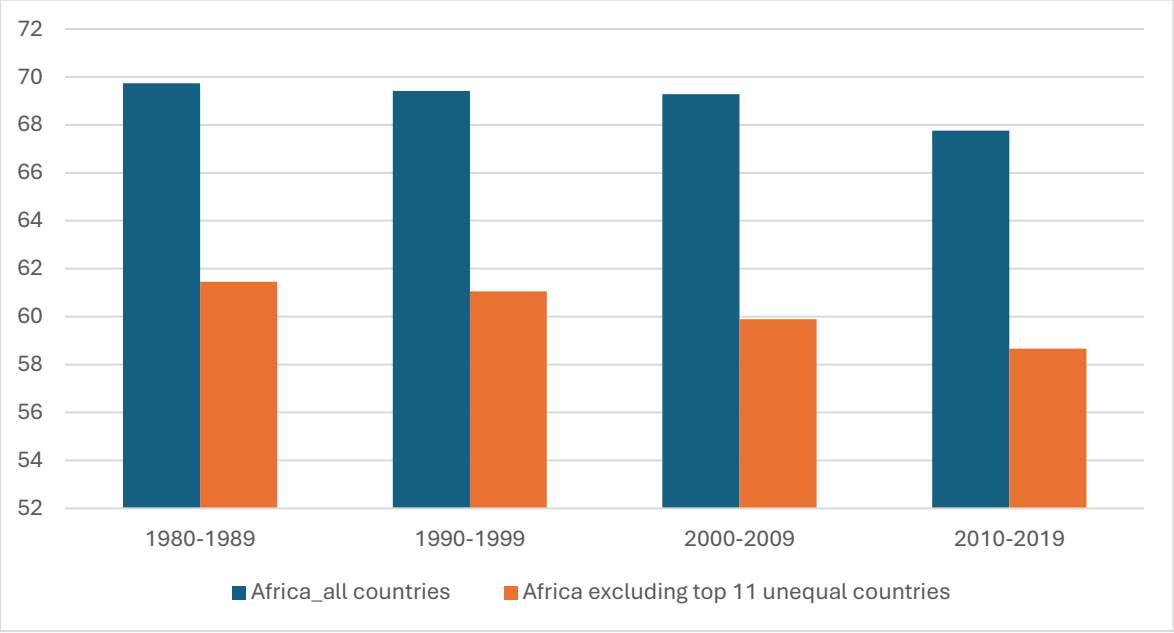
income inequality across Africa: Comparison between all countries and the subset excluding the top 11 most unequal countries, and subregional comparison.

Figure 3. 4: Income disparities in Africa



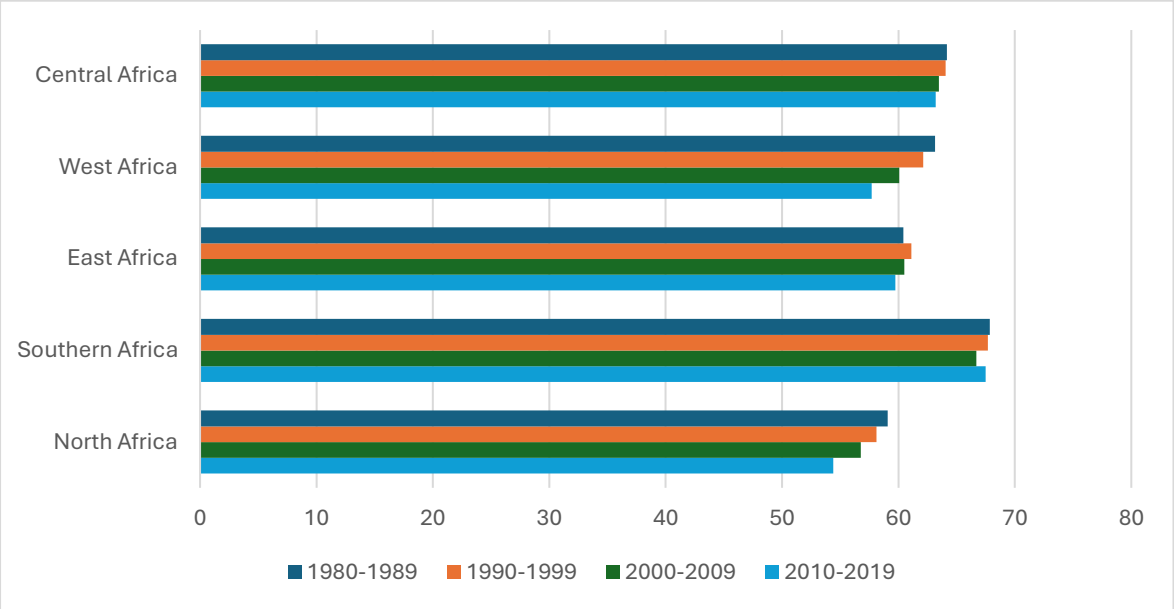
Source: Author's compilation from World Inequality Database (2024)

Figure 3. 5: Income inequality across Africa: Comparison between all countries and the subset excluding the top 11 most unequal countries



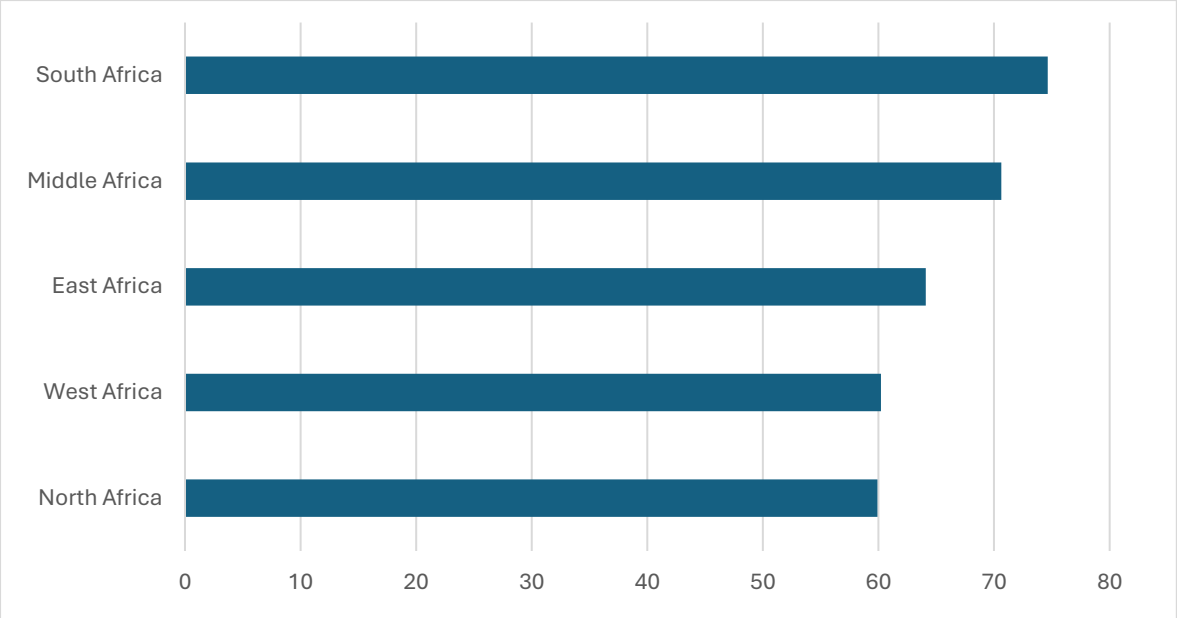
Source: Author's compilation from World Inequality Database (2024)

Figure 3. 6: Subregional comparison of income inequality in Africa – ten-year intervals from 1980 to 2019



Source: Author's compilation from World Inequality Database (2024)

Figure 3. 7: Subregional comparison of income inequality in Africa for the year 2022



Source: Author's compilation from World Inequality Database (2024)
Ten-year averages are computed using the World Inequality Database (2024)

3.4 Conclusion

This chapter discussed the concept of income inequality in Africa, considering its origins, nature, strategies to mitigate it, and trends. First, in section 3.1, the study provided a brief

overview of income inequality in Africa. In the overview, it was noted that despite the economic progress, the African economy failed to create employment opportunities for the poor and marginalised groups, leaving income inequality unchanged (OECD, African Development Bank, UNECA and UNDP, 2011). In addition, it reveals that Northern Africa is less unequal compared to regions in SSA, but still highly unequal compared to international standards.

Second, in section 3.2, the study provided an overview of international strategies to reduce income inequality from the UN and the World Bank. These included the goal to achieve fair income distribution within and among countries, social protection programmes, labour market programmes, and boosting incomes for the bottom 40 percent of the population. In addition, national strategies to reduce income inequality were discussed in line with UN and World Bank policies. The national policies implemented from country to country included social safety net programmes such as cash transfers, old-age and disability grants, creation of employment opportunities and upskilling initiatives (such as school grants).

The chapter also explored the trends in income inequality, particularly in section 3.3. In section 3.3.1, the analysis focuses on income inequality across different international regions. It finds that Africa is the third most unequal region globally, following regions like Latin America and the Middle East. In contrast, Europe is identified as the least unequal region. In addition, it revealed that this income inequality is deeply rooted in the economic structure, stemming from institutional factors such as an exclusive education system, coercive political influence, and labour market dualism, which have historically favoured the white population over Africans. These factors have contributed to significant political influence and access to economic opportunities for the former group. In addition, it noted that income inequality has been improving at a slower pace. Furthermore, the slow progress in reducing income inequality can be attributed to several post-colonial factors, including macroeconomic and political instability, government roles, a less skilled labour force, weak institutions, low levels of human capital, and inadequate healthcare. Section 3.3.2 delves into the trends within Africa itself. The analysis reveals substantial disparities among the subregions, with Southern Africa being the most unequal. Following Southern Africa, Central Africa, West Africa, and East Africa show varying degrees of income inequality. Notably, North Africa is identified as the least unequal subregion in the continent. These varying degrees of inequality can be explained by colonial settlement that mainly affected subregions in SSA than the Northern subregion. In addition, they can also be explained by macroeconomic and political instability, the role of government, less skilled

labour force, weak institutions, low human capital and poor health care, which contribute to persistent income inequality in the subregions.

CHAPTER 4
REVIEW OF THEORETICAL AND EMPIRICAL LITERATURE

4.1 Introduction

This chapter presents a review of theoretical and empirical studies on the relationship between financial inclusion and income inequality. The chapter consists of seven sections. Following the introduction, section 4.2 provides the definition and measurements of financial inclusion. In this section, various definitions and measures of financial inclusion are discussed. Section 4.3 provides the definition, various aspects and measurements of income inequality. Section 4.4 is divided into three subsections. The first section reviews various mechanisms through which financial inclusion affects income distribution among the rich and the poor. The second section reviews the fundamental theory behind the non-linear relationship between financial inclusion and income inequality and the last section provides a summary. Section 4.5 reviews findings of existing empirical literature. Section 4.6 discusses the gaps identified in the literature and how this study addresses them. Lastly, section 4.7 concludes the chapter.

4.2 Definition and Measurement of Financial Inclusion

Financial inclusion is a multidimensional concept that is defined and measured in various ways across existing literature. Therefore, in this section of the study, various definitions and measurements of financial inclusion will be provided based on existing literature. A focus on the comprehensive definitions and measurements of financial inclusion signifies a departure from the conventional notions, embracing important aspects such as well-being, financial empowerment, and economic functionality across all segments of society.

4.2.1 Conceptualisation of Financial Inclusion

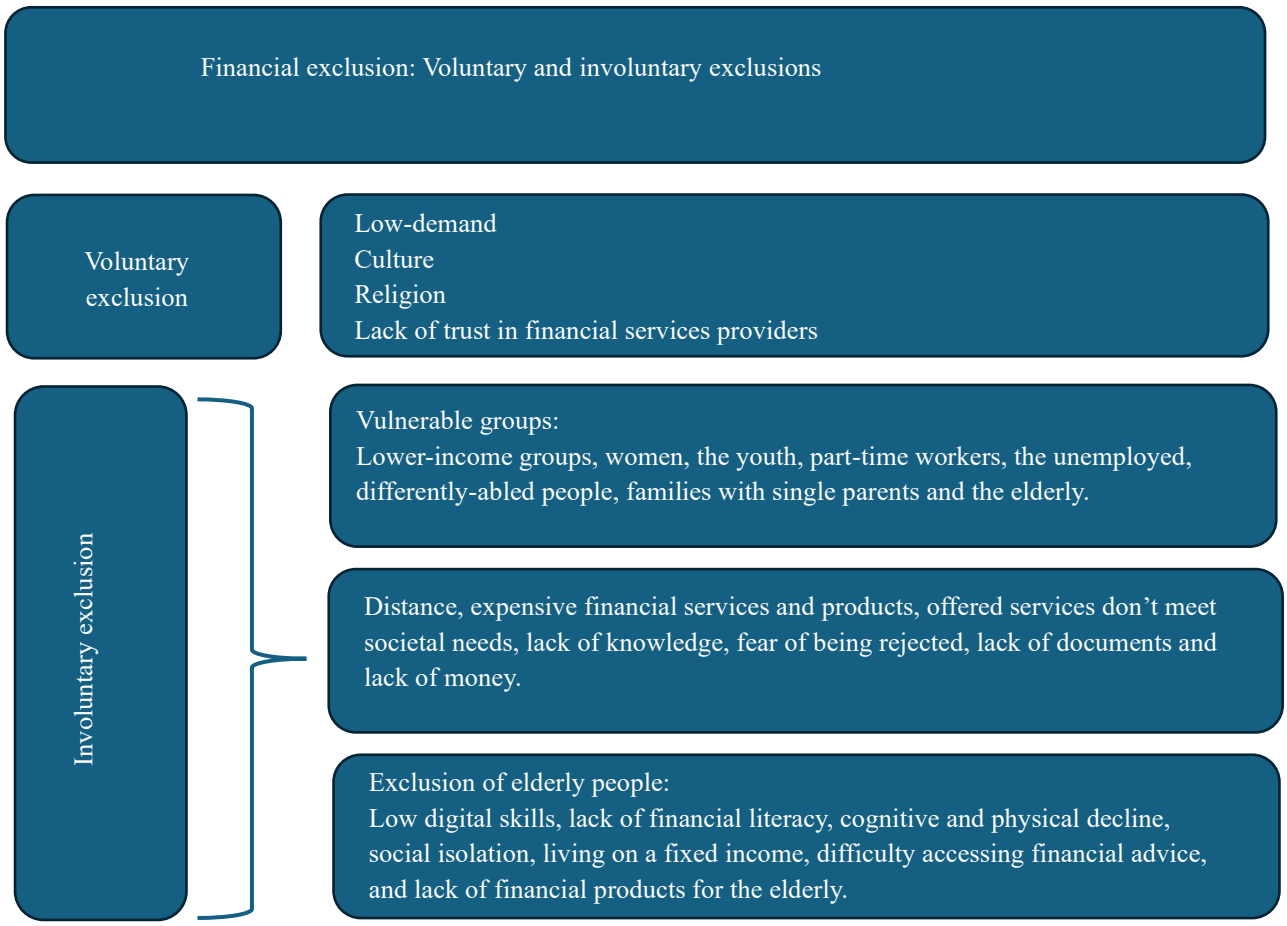
Financial inclusion is a multidimensional concept that has been defined in various ways across existing literature. The African Development Bank (2013: 32) emphasises that "*The adoption of a broader and multidimensional definition of financial inclusion is crucial in the sense that it helps to move beyond the often-erroneous assumption that inclusion will inevitably be achieved by simply offering enough access points*". Numerous studies contribute to this variance, offering their unique perspectives on what constitutes financial inclusion. Some studies define it indirectly through the lens of financial exclusion, while others define it directly (Sahay et al., 2015; Sarma, 2008; Ozili, 2018; Ozili, 2020). For example, Leyshon and Thrift (1995) argue that exclusion occurs when certain groups or individuals have no access to

financial services. Financial exclusion refers to certain practices that keep the underprivileged and impoverished social groups from having access to the financial system. These practices often revolve around processes to determine the perceived level of risk when lending money to a borrower. Although the standards of financial exclusion may change over time, the financial system tends to discriminate against poor and disadvantaged groups. In essence, the more impoverished and disadvantaged an individual is, the greater the likelihood of being excluded from the financial system. This dynamic echoes Marx's theory, which suggests that financial systems tend to serve the interests of the socially powerful. The reason is that, in the presence of weak institutions, the financial system may channel funds to wealthy people who can provide collateral and repay loans, while poor people are excluded (Clarke et al., 2006). As the financial system develops further, poor people become increasingly excluded, since they cannot borrow, and rich people have more access to money. Hence, the poor remain excluded, unable to invest in human and physical capital, and unable to start new business ventures. Therefore, capital constraints hinder poor people from making investments (Clarke et al., 2006). This prevents improvement in the social well-being of the poor and perpetuates income inequality (Demirgüç-Kunt, Beck & Honohan, 2008).

On the other hand, Sinclair (2001: 28) emphasises the inability to access essential financial services. *"Financial exclusion can be defined in either a narrow or a broader sense. In the narrow sense, it has been defined as Exclusion from various sources of credit and other financial services (including insurance, bill-payment services, and accessible and appropriate deposit accounts). In the wider sense, it refers to factors which have the effect of shutting out of the less well-off from mainstream money services"*. For example, lack of access to a bank or building society account, lending facilities, savings, insurance, and lack of access to financial advice and education restrict lower-income groups from accessing formal financial products and services (Sinclair, 2001). It is important to note that financial exclusion can be voluntary or involuntary. Financial exclusion is voluntary when individuals have access to formal financial services but decide not to use them due to lack of demand, religion, culture or lack of trust in financial services providers, among other reasons. Involuntary financial exclusion may occur because households live in remote areas, financial services have high costs that make them unaffordable, unfavourable conditions due to financial products that do not suit people's needs, lack of knowledge because financial services are not marketed, households may exclude themselves due to fear of being rejected, lack of documents, and lack of money (Kempson & Whyley, 1999; Tita & Aziakpono, 2017). Certain groups are specifically vulnerable to these

exclusions, including lower-income individuals, women, youth, part-time workers, the unemployed, differently abled people, families with single parents and the elderly (Náñez Alonso, Jorge-Vazquez, Arias & del Nogal, 2024). The elderly, in particular, face involuntary exclusion due to factors such as low digital skills, lack of financial literacy, cognitive decline, physical decline, social isolation, living on a fixed income from a pension or annuity, difficulty accessing financial advice, and lack of financial products for the elderly (Tok & Heng, 2022). Figure 4.1 presents a summary of the groups that are most vulnerable to financial exclusion, voluntary and involuntary exclusion factors.

Figure 4. 1: Vulnerable groups, voluntary and involuntary exclusions



Source: Author's compilation: Kempson & Whyley (1999); Náñez Alonso et al. (2024); Tita & Aziakpono (2017); Tok & Heng (2022)

In contrast, financial inclusion is defined as easy access to, availability and use of formal financial services by previously excluded businesses and citizens in society (Amidžić et al., 2014; Sahay et al., 2015; Sarma, 2008; Ozili, 2018; Ozili, 2020). The idea behind financial inclusion is that financial services must be available and accessible to the population for various

uses, which include, but are not limited to, bank accounts, savings accounts, ATMs, and credit facilities for individuals and firms (Sahay et al., 2015). Financial inclusion also entails providing financial services at low costs to previously disadvantaged and low-income groups (Dev, 2006). The World Bank Group (2022a) defines it as useful and affordable access to financial products that are delivered in a responsible and sustainable way to meet the needs (such as transactions, savings, payments, credit, and insurance) of individuals and businesses. Furthermore, Álvarez-Gamboa, Cabrera-Barona and J´acome-Estrella (2021) and Chakravarty and Pal (2013) define it as a tool that removes barriers to access and use of financial products for the poor and previously disadvantaged groups. Overall, financial inclusion enables easy access to, availability, affordability and delivery of formal financial products to all economic participants of the country.

4.2.2 The Various Definitions of Financial Inclusion: Financial Inclusion Organisations

Expanding on the multifaceted discourse surrounding financial inclusion, this section presents definitions of financial inclusion from various global institutions, including the World Bank, the OECD, the Consultative Group to Assist the Poor (CGAP), the AFI, and the IMF. The selection of these organisations is informed by their global impact in the field of financial inclusion.

Financial inclusion, as defined by the World Bank, refers to an economic state where a proportion of people and businesses have access to affordable and useful financial products and services such as transactions, payments, credit, savings, and insurance, along with responsible and sustainable delivery (World Bank, 2014; World Bank Group, 2025a).

The Consultative Group to Assist the Poor (CGAP) explains that financial inclusion is a process in which all working-age adults have access to and are empowered to use formal financial services and products that are convenient, affordable for customers, sustainable for providers, and are delivered responsibly. These products and services may include payments, savings, credit and insurance (CGAP, 2011; CGAP, 2025).

Financial inclusion, according to the AFI, means that individuals and businesses not only have access to affordable financial products and services, but actually use them. In addition, these products are customised according to their needs and have an impact on the lives of people and businesses (African Development Bank, 2013; AFI, 2010).

The IMF defines financial inclusion as a mechanism through which people and companies have universal access to and use of a wide range of affordable formal financial services (Frost, Gambacorta & Shin, 2021; Sahay et al., 2015). These financial services include deposits and loans (Amidžić et al., 2014).

According to the OECD International Network on Financial Education, financial inclusion entails advancing affordable, timely, and sufficient access to a variety of regulated financial products and services and encouraging their use by all the different groups of people within a society. This is achieved by applying customised existing and inventive strategies such as financial awareness and education, aimed at enhancing financial well-being, as well as economic and social inclusion (OECD, 2013).

Although there are various definitions of financial inclusion as presented above, it is clear that there are common key aspects that draw a picture of what financial inclusion looks like. For instance, the definitions highlight the following aspects:

i) There must be access to a variety of formal financial services and products. According to the Corporate Financial Institute (CFI) (2024), financial access is important to both people in general and businesses because it provides a means to store money, build savings, manage cashflows from transactions, and provides access to credit and making investments. Such access serves as a key to acquiring assets and accumulating financial security.

ii) There must be encouraged usage of formal financial products and services by all the different groups of people within a society. To use these products, both people and businesses should be empowered to use them. This can be achieved by implementing tailored and existing strategies, such as financial education, to improve the participation of all individuals in the financial system (particularly low-income groups, previously disadvantaged and excluded) and enhance financial awareness among people and companies.

iii) These financial services must be provided at affordable costs, which will ensure that the unbanked and underbanked can participate in the formal financial system.

iv) The definitions refer to the quality of the financial services provided. The provision of these financial products and services should be regulated. The reason is that, if financial institutions that provide such financial goods are poorly regulated, they may potentially undermine the stability of the financial system, be harmful to the

consumers and damage the prospects of the economy (Central Bank of Ireland, 2024).

v) These financial products and services must be tailored according to the needs of the customers, accessible as and when the need arises (timely) and are sufficient to meet the needs of a situation experienced by customers to improve social and economic inclusion.

Based on the definitions above, it can be deduced that financial inclusion entails ensuring that all individuals and businesses, especially those belonging to low-income groups, historically disadvantaged or excluded communities, have access to and usage of affordable, customised, timely, sufficient, and regulated formal financial services and products. This can be facilitated through financial education initiatives aimed at improving financial well-being and enabling social and economic inclusion, which will reduce involuntary financial exclusion.

4.2.3 The Dimensions and Measurements of Financial Inclusion

Given the multifaceted nature of financial inclusion, as explored in the literature, which endeavours to understand it through various definitions, the literature also tries to understand it from different dimensions and measurements. Consequently, Sarma (2008) advocated for a comprehensive measure that encompasses the various aspects of financial inclusion. These aspects are access, usage, cost, quality, penetration and availability.

The first dimension is access. Financial access is defined as the availability and opportunity to access financial service points easily, or the absence of monetary or non-monetary barriers. In addition, the available financial services are supplied in appropriate quality and costs (AFI, 2013; Amidžić et al., 2014; Arora, 2010; Beck, Demirgüç-Kunt & Martinez Peria, 2007). Its proxies are the percentage of the adult population with financial accounts to total population, the proportion of the adult population with credit and debit card, percentage share of adult population with a mobile money account, ATMs per 100,000 adults, commercial bank branches per 100,000 adults, ATMs per 1,000 km^2, commercial bank branches per 1,000 km^2, personal remittances received (Abdulkarim & Ali, 2019; AFI, 2013; Amidžić et al., 2014; Azim, 2022; Cámara & Tuesta, 2014; Park & Mercado, 2015; Ratnawati, 2020; Sarma 2008; World Bank, 2022c).

The second one is usage. This dimension is defined as the extent to which formal financial services and products are used among different groups that benefit the welfare of many individuals (AFI, 2019d; Demirgüç-Kunt & Klapper, 2013). It also refers to people who have bank accounts but use them sparingly. These people are called the "underbanked" or "marginally banked" (Sarma, 2008). Its measures consist of the share of the adult population who borrowed and saved from a financial institution, domestic credit to GDP ratio, volume of credit and deposits as a proportion of the country's GDP, people who have a bank account, credit card or debit card (Amidžić et al., 2014; Cáamara & Tuesta, 2014; Demir, Pesqué-Cela, Altunbaş, & Murinde, 2022; Omar & Inaba, 2020; Park & Mercado, 2015; Sarma, 2008).

The third dimension is cost. It is defined as the availability of financial services that reflect both price and non-price costs of accessing and using financial services and products. These costs may include banking fees and distance or costs incurred to reach the service points (Arora, 2010).

The fourth dimension represents quality. The dimension of quality refers to the degree to which financial services meet the requirements of the consumers. That is, whether the financial services meet the needs of customers from various angles, such as convenience, fair treatment, affordability, choice, and that customers are informed and protected (AFI, 2019). "*Financial education is one of the best ways to empower the working poor (and, frankly, all of us) to take control over their financial lives, which has a ripple effect to all areas of their lives*" (Gardeva & Rhyne, 2011: 9). This aspect of financial inclusion can be measured by financial education, cost of usage, disclosure requirements and dispute resolution (African Development Bank, 2013; Amidžić et al., 2014; GPFI, 2016).

The fifth dimension is penetration. The penetration dimension refers to the inclusion of as many consumers as possible. That is, the offered and available financial services should penetrate extensively among different groups of consumers in society. This dimension is measured through the number of people having a bank account (Sarma, 2008).

The sixth dimension is availability. It refers to the ease of availability of financial services and products to the users (Sarma, 2008). It's widely measured by the number of commercial bank branches, ATMs per 100,000 adults, and the number of bank employees per customer (Park & Mercado, 2015; Sarma, 2008). Table 4.1 presents a summary of how financial inclusion is

viewed as a multidimensional concept encompassing access, usage, availability, penetration, cost and quality.

Table 4. 1: Multidimensional concept of financial inclusion: access, usage, cost, availability, penetration, quality

Dimension(s)	Definition	Measure(s)
Access	• Ability to reach points of service easily. • Available supply of reasonable financial services. • Absence of price and non-price barriers.	• Number of bank branches per 1,000 km^2 or per 100,000 adults • Proportion of the adult population with credit or debit cards • Mobile money account and those with a financial account • Number of ATMs per 1,000 km^2 or per 100,000 adults • Personal remittances received
Usage	• People who are "underbanked" or "marginally banked". • Actual usage of financial services and products.	• Share of the adult population who borrowed or saved from a financial institution • Domestic credit to GDP ratio • Volume of credit and deposits as a percentage of the country's GDP • People who have a bank account • People who have a credit or debit card.
Cost	• Reflect price and non-price costs of financial services and products.	• Banking fees • Distance or costs incurred to reach the service points
Quality	• Customised according to the customer's needs. • Customers are well-informed.	• Financial Education • Financial literacy • Cost of usage • Disclosure requirements • Dispute resolution
Penetration	• Inclusion of as many consumers as possible.	• Number of people having bank accounts • Number of bank accounts as a percentage of total population • Number of deposit accounts with commercial banks, credit unions and credit cooperatives per 1,000 adults
Availability	• Availability of financial services points to the consumers.	• Number of commercial bank branches per 1,000 population • Number of bank employees per customer • Number of ATMs per 1,000 people

Source: Author's compilation following Abdulikarim and Ali (2019); African Development Bank (AfDB) (2013); Amidžić et al. (2014); Azim (2022); Cámara and Tuesta (2014); Demir et al. (2022); Nguyen (2021); Omar and Inaba (2020); Park and Mercado (2015); GPFI (2016); Ratnawati (2020); Sarma (2008); World Bank (2022c)

Furthermore, in response to this complexity, numerous international institutions (mainly donor-funded) have invested significant resources to compile databases to measure financial inclusion

covering countries globally. These measures particularly focus on supply and demand-side factors and they are created with the aim of tracking and measuring the progress of financial inclusion (African Development Bank, 2013; Demirgüç-Kunt & Klapper, 2012; GPFI, 2016). These institutions are the "*World Bank Global Findex Database, IMF Financial Access Survey, Gallup World Poll, World Bank Enterprise Surveys, OECD National Financial Literacy and Financial Inclusion Surveys, OECD Financing SMEs and Entrepreneurs Scoreboard, World Bank Doing Business, World Bank Global Survey on Consumer Protection and Financial Literacy, World Bank Financial Capability Surveys, and World Bank Global Payments Systems Surve*" (GPFI, 2016: 3).

In 2013, the G20, together with GPFI implementing partners, endorsed a set of financial inclusion indicators to improve the understanding of the aspects of financial inclusion. These new measures have been suggested to assess the accessibility, availability, utilisation and quality of financial services and products. The extension and revision of the current indicators is motivated by the development of new digital models to provide financial services and products, along with the availability of new data on both the provision and demand for these services and products. Table 4.2 provides the set of indicators that are recognised as measures of financial inclusion.

Table 4. 2: Set of indicators for financial inclusion

Dimension(s)	Category	Indicator	Source
Usage: adults	Adults with an account	**Account (% age 15+)** *It is the percentage of adults who report having an account (by themselves or together with someone else) with a formal financial institution or a mobile money provider.*	World Bank Global Findex
	Number of accounts	**Deposit accounts at commercial banks per 1,000 adults** *Are the reported number of deposit account holders at commercial banks and other resident banks functioning as commercial banks?*	**IMF Financial** Access Surveys
		Number of e-money accounts per 1,000 adults *It denotes the number of e-money accounts per 1,000 adults.*	World B**ank** Global Payments Systems Survey
		Mobile money transactions per 100,000 adults *It is defined as the number of mobile money transactions per 100,000 adults.*	IMF Financial Access Surveys
	Adults with credit at regulated institutions	**Borrowed from a financial institution in the past year (% age 15+)** *It measured the percentage of adults with at least one loan outstanding from a bank or other formal financial institution.*	World Bank Global Findex
		Outstanding loans per 1,000 adults *It is the reported number of resident customers that are non-financial corporations (public and private) and households who obtained loans from commercial banks and other banks functioning as commercial banks.*	IMF Financial Access Surveys
	Adults with insurance	**Insurance policy holders per 1,000 adults** *Disaggregated by life and non-life insurance.*	IMF Financial Access Surveys
	Cashless transactions	**Retail cashless transactions per 1,000 adults** *Includes: number of cheques, credit transfers, direct debits, payment card transactions (debit cards, credit cards), and payments by e-money instruments (card-based e-money instruments, mobile money products, and online money products).*	World Bank Global Payments Systems Survey
	Adults using digital payments	**Made or received digital payments (% age 15+)** *It is the percentage of adults using a transaction account (with a bank or other formal financial institution or mobile money provider) to make or receive a digital financial payment using the internet or phone.*	World Bank Global Findex
	Payment using a mobile phone (from an account)	**Made payment using mobile phone (% age 15+)** *It is the **p**ercentage of adults using a mobile phone to pay bills, make purchases, or send or receive money from an account (with a bank or other formal financial institution or mobile money provider)**.***	World Bank Global Findex

	Payment using the internet	**Made payment using the internet (% age 15+)** *It is the percentage of adults using the internet to pay bills, make purchases, or send money online.*	World Bank Global Findex
	Payment using a bank card	**Made payment using a debit card (% age 15+)** *It is the **p**ercentage of adults using a debit card to directly make a payment from an account (with a bank or other formal financial institution).*	World Bank Global Findex
	Payment using account	**Received wages or government transfers into an account (% age 15+)** *It is the percentage of adults who receive wages or government transfers into an account (with a bank or other formal financial institution or mobile money provider).*	World Bank Global Findex
	High frequency of account use	**High frequency of account use (% age 15+)** *It is the percentage of adults with high frequency use of an account. "High frequency" entails making withdrawals or transactions from a personal bank account or formal financial institution more than three times in a typical month, including cash withdrawals, electronic payments, purchase**s**, or any other debit method**,** initiated by the account owner or third parties.*	World Bank Global Findex
	Saving propensity	**Saved at a financial institution (% age 15+)** *It is the percentage of adults that saved at a bank or other formal financial institution in the past year.*	World Bank Global Findex
Usage: businesses	Formally banked businesses	**SMEs with an account at a formal financial institution (%)** *It is the percentage of Small or Medium-Sized Enterprises (SMEs) with an account at a bank or other formal financial institution.*	World Bank Enterprise Surveys
		SME deposit accounts (as a % of non-financial corporation borrowers) *It is the number of SME deposit accounts (as a % of non-financial corporation borrowers).*	IMF Financial Access Surveys
	Businesses with outstanding loan or line of credit at regulated institutions	**SMEs with an outstanding loan or line of credit (%)** *It is the percentage of SMEs with outstanding loan or line of credit from a bank or other formal financial institution.*	World Bank Enterprise Surveys
		SME loan accounts (as a % of non-financial corporation borrowers) *Number of SME loan accounts (as a % of non-financial corporation borrowers).*	IMF Financial Access Surveys
	Digital payments to or from businesses	**SMEs that send or receive digital payments from an account** (%) *It is the percentage of SMEs that send or receive digital payments from an account.*	World Bank Enterprise Surveys
Access: physical points of services	Point of service	**Branches per 100,000 adults** *Number of branches per 100,000 adults.*	IMF Financial Access Surveys

		ATMs per 100,000 adults *It is the number of ATMs per 100,000 adults.*	**IMF Financial Access** Surveys
		Agents of payment service providers per 100,000 adults *Includes agents of banks and other deposit-taking institutions, as well as specialised entities such as money transfer operators and e-money issuers.*	World Bank Global Payments Systems Survey
		Mobile agent outlets per 100,000 adults *It is the number of mobile agent outlets per 100,000 adults.*	**IMF Financial Access** Surveys
		POS terminals per 100,000 adults *It is the number of POS terminals per 100,000 adults.*	World Bank Global Payments Systems Survey
		Access to a mobile phone or internet at home (% age 15+) *It is the percentage of adults with access to a mobile phone or device or internet access in the home.*	Gallup World Poll
	Debit card and ownership	**Debit cards per 1,000 adults** *It is the number of debit cards per 1,000 adults.*	World Bank Global Payments Systems Survey
Access: businesses	Enterprise points of service	**SMEs that have a POS terminal (%)** *It is the percentage of SMEs that have a point of sale (POS) terminal.*	World Bank Enterprise Surveys
	Interoperability of points of service	**Interoperability of ATM networks and interoperability of POS terminals (0-1)** *Takes the value 1 if most or all ATM networks (/POS terminals) are interconnected and 0 if they are not interconnected.*	World Bank Global Payments Systems Survey
Quality: financial literacy and capacity	Financial knowledge	**Financial knowledge score** *Arithmetic score which sums up correct responses to questions about basic financial concepts, such as: (A) Inflation, (B) Interest rate, (C) Compound interest, (D) Money illusion, (E) Risk diversification, (F) Main purpose of insurance.*	World Bank Financial Capability Surveys and OECD National Financial Literacy and Inclusion Surveys
	Financial behaviour	**Use of savings for emergency funding** *It is the percentage of adults who responded in one of the following ways to the question: If you had an emergency that required [$10, or 1/25 of GDPPC] urgently, where would you get the money?: a)*	World Bank Global Findex

		borrow from friends/relative; b) work more; c) sell assets; d) savings; e) loan from savings club; f) loan from bank; g) would not be able to find it.	
Quality: market conduct and consumer protection	Disclosure requirements	**Disclosure mechanism** *These are the requirements for disclosure including plain language requirement (e.g. prohibition of hidden clauses)***, l***ocal language requirement, ***p***rescribed standardized disclosure format, ***r***ecourse rights and processes***,*** total rate to be paid for a credit (basic costs plus commission rates, fees, insurance, taxes).*	World Bank Global Consumer Protection Survey
	Dispute resolution	**Internal and external dispute resolutions** *Includes internal dispute resolutions such as law or regulation setting standards for complaints resolution and handling by financial institutions***,** *and external dispute resolution***s** *such as the* ***s****ystem in place that allows a customer to seek affordable and efficient recourse with a third party***.**	World Bank Global Consumer Protection Survey
Quality: barriers to use	Credit barriers	**Percentage of SMEs required to provide collateral on their last bank loan** *It reflects the tightness of credit conditions.*	World Bank Enterprise Surveys and OECD SME Scoreboard
		Getting credit *It reflects the strength of credit reporting systems and the effectiveness of collateral and bankruptcy laws in facilitating lending.*	World Bank Global Doing Business

Source: Author's compilation based on GPFI (2016). Note: IMF stands for International Monetary Fund

4.3 Conceptual Definition of Income Inequality

This section critically discusses the definition of income inequality, along with its various dimensions and measures.

4.3.1 Definition of Income Inequality

Unlike financial inclusion, which has various definitions, income inequality has a unified definition. Income is defined as the gross or disposable income of households within a particular year. Gross income is income before all taxes and transfers, while disposable income is the income remaining after all taxes and transfers (OECD, 2024b; World Inequality Database, 2024). It includes returns from factors of production such as rent, interest, and wages (Kakwani, 1980). Therefore, income inequality refers to the extent to which earnings are unevenly distributed within a population, meaning that the income gap between the population is widening (Atkinson, 1970). This income inequality stems from the unequal distribution of income among a certain population, and relates to the determination of income distribution among the factors of production (Kakwani, 1980; Kebede et al., 2023; Shimeles & Nabassaga, 2018). It also shows changes in the income shares of the population (Dabla-Norris et al., 2015).

This theoretical view underlines the divergence of income from the optimal condition of equality and the differences in the distribution of income across various segments of groups within a society.

4.3.2 Dimensions of Income Inequality

Although income inequality has a unified definition, existing literature views it based on various aspects. These dimensions are the unequal returns to factors of production, unequal distribution of earnings, inequality in opportunities and intergenerational inequality.

The first aspect relates inequality to functional distribution, which involves unequal distribution of returns from factors of production such as rent, interest and wages (Kakwani, 1980). This aspect is also known from the foundation of economic thinking, dating back to Karl Marx, who proposed the theory of class conflict because of the wealth that is in the hands of the few capitalists and the absolute and relative impoverishment of the working class (Brue & Grant, 2013). On the other hand, the emergence of marginalist thinking around 1871 postulated that income inequality results from the interaction of market forces. According to the marginalists, the income of the economic participants is proportional to their marginal

productivity. The earnings from factors of production reflect the marginal productivity of economic participants in production processes when the market functions freely. Thus, resulting in unequal distribution of the national pie (Shimeles & Nabassaga, 2018).

The second perspective on income inequality stems from unequal distribution of income within the population, which also relates to the determination of income distribution among the factors of production (Kakwani, 1980; Kebede et al., 2023; Shimeles & Nabassaga, 2018). It shows changes in the income shares of the population and information regarding the assets possessed by the wealthiest, which provides another view on income inequality (Dabla-Norris et al., 2015). It is often provided as a statistical summary of information showing how equitable a society or a country is at a certain point in time. This inequality arises due to factors such as technological and labour market changes. Technological changes that involve the automation of the production processes raise the demand for skilled labour relative to low- and unskilled labour (Acemoglu, 1998; Card & DiNardo, 2002; Dabla-Norris et al., 2015). In addition, changes in labour market policies and regulations aimed at improving the quality of the labour force, matching supply and demand for labour, and maintaining fairness among the labour force participants can lead to variations in levels of income. Thus, posing challenges for workers with low skills and those unskilled (van der Hoeven & Saget, 2004). Consequently, both factors cause an increase in skills premium, which is the ratio between the earnings of the skilled and the unskilled workers.

The third aspect of income inequality is viewed from the perspective of unequal opportunities and efforts of the individuals (Kebede et al., 2023; Shimeles & Nabassaga, 2018). This is often measured by analysing the outcomes of the level of access to health care, education and human development by different income groups (Dabla-Norris et al., 2015). The lack of opportunities may be emerging from unequal access to education, the labour market and finance (Aiyar & Ebeke, 2019). Disparities in opportunities i) have an effect on an individual's life expectancy and access to basic services such as health care, sanitation, water and education; ii) limit the human rights of a person through discrimination, abuse and lack of access to justice; iii) hinder the accumulation of skills, constrain social and economic mobility and human development, thereby suppressing economic growth; and iv) breed insecurity, uncertainty and erodes trust in governments and institutions resulting in social conflict and tension which triggers violence (United Nations, 2020).

The fourth notion of income inequality may also be viewed from the aspect of intergenerational inequality that deals with whether and how income inequality evolves over generations (Demirgüç-Kunt & Levine, 2009; Kebede et al., 2023). According to Loury (1981: 844), *"because family income in a particular generation depends on the level of training which the parent received in the previous period and that training investment depends on the family's income in the preceding generation, the distribution of income among a given generation depends on the distribution which was obtained in the previous generation"*. Income is positively correlated from generation to generation because the acquisition of productivity enhancing qualities in the young adult stage is positively influenced by the parents' income. Parents are in control of the resources available in the family. It is also worth noting that due to different abilities and backgrounds, their earnings are different and investing in human capital of their children will vary. Therefore, the process of income distribution in an economy is implied by decision making and random allocation of abilities by parents to their children (Loury, 1981).

In addition, income inequality may be transferred from generation to generation (from parents to children) due to different earnings and savings behaviour or inherent differences in productivity (Aghion & Bolton 1992). The association results from human capital investment, which shifts the distribution of income. Different investments in human capital by parents in their children have a significant role in generational inequality because human capital formation cannot be financed by claiming from the future income of the child. Consequently, wealthy families are more able to invest in human capital than poor families and therefore, income inequalities will be passed on from generation to generation (Durlauf, 1996). This is because when there are no credit markets, the level of investment in human capital is directly correlated to inherited wealth and therefore, income will also be related across the generations of the same family (Aghion & Bolton, 1992; Loury, 1981). This may result in permanent income inequality since poor families cannot invest in human capital for their children, which would allow future generations to attain high-income jobs (Durlauf, 1996).

4.3.3 Measures of Income Inequality

This section will discuss the most popular and used measures of income inequality found in existing literature. These are the Gini coefficient, Palma ratio, Theil index and Atkinson index. This is because income inequality can be viewed based on many aspects, which are all related.

The first indicator is the Gini coefficient. "*The Gini index is a component of the earnings circulation of a nation's inhabitants*", which is by far the most popular proxy of income inequality that has been used throughout literature (Menyelim et al., 2021: 6). The Gini coefficient (also known as the Gini index) is derived from the Lorenz curve, which plots the percentage of earned income against the percentage of cumulative population (Deiniger & Squire, 1996; De Maio, 2007). It measures inequality of income on a scale from 0 for perfect equality and 1 for perfect inequality, where a high value indicates high inequality (Hasell & Roser, 2023). Unless specified differently, the Gini coefficient represents a redistribution of income before (Gini gross) or after any taxes and transfers (Gini disposable) or by tracking changes in the percentage of income of the population (Dabla-Norris et al., 2015; IMF, 2022).

The second measure is the Palma ratio. The Palma ratio indicates the percentage of total income earned by 10 percent of the individuals with the highest disposable income against the percentage of the total income earned by the 40 percent of people with the lowest disposable income (OECD, 2024b). The Palma ratio is primarily focused on the distribution of income between the highest and the lowest levels of income distribution. It specifies inequality in income within a group of measures known as the inter-deciles. The Palma proposition is that changes in earnings inequality are caused by changes in the proportion of the richest and the poorest, leaving the income share of the middle-income group unchanged (Cobham, Schlogl & Sumner, 2015; United Nations, 2015). A higher value of the ratio indicates higher inequality measured in terms of gross income or disposable income (OECD, 2024b; World Inequality Database, 2023b).

The third measure is the Theil index. "*The Theil index is composed of the disparities within subgroups of regions and the disparities between subgroups of regions*" (Menyelim et al., 2021: 6). The Thiel index specifies income inequality within a group of measures known as the General Entropy class (World Bank, 2024b). The values of the index range between 0 (perfect equality) and infinity (1 if normalised; perfect inequality). The UN (2015a) reported that the Theil index has two key features. First, the index can break down inequality by population groups, or sources of income. Second, during estimation, the researcher selects the parameters which assign weights to the gaps between incomes across different segments of the distribution of income. With lower values, the measure is more responsive to changes in the lower end of distribution, whereas with higher values, it is more responsive to changes occurring in the upper end of the distribution (Atkinson & Bourguignon, 2015; UN, 2015a). Changes in the Theil

index resulting from the redistribution of income depend on the individual's income level subject to redistribution and the affected size of the population (Bellù & Liberati, 2006a; UN, 2015a).

The Atkinson index is the fourth measure of income inequality. This is the most recognised welfare-based measure of income inequality (UN, 2015a). "*The Atkinson index estimates disparity by figuring out which end of the dispersion contributed most to the noticed imbalance*" (Liao, 2016; Menyelim et al., 2021: 6; OECD, 2016). It presents the share of all income that a society would need to sacrifice to achieve a more equal distribution of income between its citizens. The Atkinson index relies on the level of society's aversion to inequality, which is a theoretical variable determined by the researcher. A higher value entails a strong social preference for equal distribution, indicating willingness among the people to accept reduced income in exchange for equal distribution. A significant characteristic of this index is its ability to be disaggregated into income inequality within and between various groups of society (Bellù & Liberati, 2006b; UN, 2015a).

The issue of income inequality is one of the major problems in global discussions concerning economic development. Consequently, resulting in inefficiency in the economy, which triggers various social issues such as rent seeking and bribery because of the power held by the rich minority in a country (Todaro & Smith, 2012). The concerns surrounding income inequality need to be addressed because it can cause lack of investment in human capital resulting in inefficient allocation of skills (Galor & Zeira, 1993); low demand growth (Carvalho & Rezai, 2014; Cynamon & Fazzari, 3013); hinder mobility across generations (Aslan et al., 2017; Corak, 2013); and fuel economic, and political instability, pose risks on social stability, and result in low growth rates (Dabla-Norris et al., 2015; Ostry et al., 2014).

4.4 Theoretical Link Between Financial Inclusion and Income Inequality

Various theoretical studies have identified the mechanisms through which financial inclusion is linked to income inequality. This section provides a discussion of the theoretical frameworks that explain the transmission mechanism between financial inclusion and income inequality. In addition, this section distinguishes between the linear and non-linear association of these variables.

4.4.1 Linear Relationship Between Financial Inclusion and Income Inequality

In literature, there are various mechanisms through which financial inclusion affects income distribution among the rich and the poor:

4.4.1.1 The Channel of Capital Accumulation

Capital accumulation is regarded as indispensable for economic progress (Breit, 1964). This is because, as capital accumulation increases, more funds are available in the economy for poor people to invest (Aghion & Bolton, 1997). Financial inclusion is believed to be correlated with income inequality through capital accumulation (Aghion & Bolton, 1992; Aghion & Bolton, 1997). Capital accumulation may occur through borrowing and lending in the capital market. However, in the face of capital market imperfection, which hinders capital accumulation, there is a possibility of persistent income inequality (Aghion & Bolton, 1992; Aghion & Bolton, 1997). Imperfection in the financial market may arise due to costs related to contract enforcement, inspection costs (that arise due to measures put in place by the lenders to limit the risk of borrowers defaulting on loan payments), moral hazard (where the lender assumes that the borrower may engage in activities that may raise the risk of the borrower defaulting on loan payment), and wealth constraints (Aghion & Bolton, 1997; Galor & Zeira, 1993). In the presence of financial market imperfections, such as asymmetric information and transaction costs, the ability to invest in physical and human capital depends on an individual's wealth.

Clarke et al. (2006) reported that a model by Galor and Zeira (1993) proposed that income inequality will grow continually in an economy with financial market imperfections and a highly unequal distribution of wealth compared to an economy with less capital market imperfections and less unequal distribution of wealth. For example, the problem of asymmetric information leads to regulations that are set to protect the borrowers, which cause creditors to put stricter measures in place to acquire loans. As a result, poor people are unable to invest in education, irrespective of their high marginal productivity of investment, since they have limited access to formal financial products (Aghion & Bolton, 1992; Banerjee & Newman, 1993; Galor & Zeira, 1993; Panizza, 2002; Piketty, 1997). Hence, financial exclusion, caused by financial market imperfections, hinders capital accumulation and leads to persistent income inequality.

However, in the presence of minimal financial market imperfections, everyone has access to the available investment opportunities, and people with entrepreneurial capabilities will gain

access to credit to finance new business ventures and expansions. As a result, access to credit will not depend on wealth, but on the person's ability and how the business idea was executed (Aghion & Bolton, 1997; Demirgüç-Kunt & Levine, 2009; Tita & Aziakpono, 2017). With improvement in the availability and movement of capital, financial inclusion fosters entrepreneurship, which over time will lead to employment creation and productivity, thus reducing the income gap between the poor and rich both currently and in the future (Klapper, Laeven & Rajan, 2006; Segning et al., 2023).

4.4.1.2 The Labour Market Channel

Existing literature regarding the channel of the labour market stated that the relationship between financial inclusion and income inequality occurs through the inclusion of the majority of the country's population in the labour market and in formal economic activities (Gine & Townsend, 2004; cited Aslan et al., 2017). The effect of the labour market on income inequality will depend on the extent of financial access acquired, the initial economic circumstances and the productivity of labour (Tita & Aziakpono, 2017). However, capital market imperfections interfere with this relationship by hindering access to finance, thus exacerbating income inequality within the labour market. These imperfections hinder investment and opportunities for borrowing, which are important for investing in human capital accumulation and income-generating activities (Banerjee & Newman, 1993). As a result, job opportunities which require high investments are beyond the reach of poor people, who will instead choose to work for wealthy people, where they stand to earn low wages. With access to finance, income distribution can be improved through the labour market (Gine & Townsend, 2004; Lui, Zhang, Hafeez & Ullah, 2022). Having access to finance increases competitiveness, resulting in low intermediary costs, thus broadening access to credit. Therefore, access to credit enables investment opportunities in capital accumulation and in new businesses that do not depend on wealth status. As a result, employment opportunities created in the labour market through growth in businesses contribute to income generation, thereby reducing income inequality (Lui et al., 2022).

4.4.1.3 The Channel of Entrepreneurial Activities

Regarding the channel of investing in income-generating activities such as entrepreneurial activities, financial inclusion is associated with income inequality by promoting innovative entrepreneurs through the movement and availability of capital, which results in employment and high productivity in the long run (Klapper et al., 2006; Sharma, 2016). In addition, financial

inclusion creates access to investment opportunities regardless of parental wealth. Consequently, this increases the availability of economic opportunities, which in turn, promotes gradual fair income distribution as businesses create more employment opportunities that offer better wages (Tita & Aziakpono, 2017). In this regard, new and small businesses are considered to be significant institutions for creating new job opportunities, sources of new inventions, improvements in competition, enhancing human capital (through skills development), and the establishment of a financial system, which results in income generation that contributes to low-income inequality (Klapper et al., 2006; Oshora, Desalegn, Gorgenyi-Hegyes, Fekete-Farkas & Zeman, 2021). Therefore, access to finance by new and small businesses does not only help them grow but also improves productivity, leading to the creation of more job opportunities, thus reducing the income gap in the long run (Tita & Aziakpono, 2017).

4.4.1.4 The Channel of Education

According to Kazemikhasragh and Buoni (2022), financial inclusion and education are regarded as contributors to the development and economic growth of a country. The link from financial inclusion to income inequality occurs when both the poor and previously marginalised people take advantage of access to finance to invest in human capital accumulation (education and training) (Klapper et al., 2006; Segning et al., 2023). When the poor have access to formal financial products and services, they can acquire credit to invest in education and training. In addition, inclusion enables them to achieve a balance between current needs, saving for the future and managing unexpected financial shocks (Sharma, 2016). The acquired skills will enhance their opportunity to get decent jobs or become self-employed and, in turn, break the cycle of income inequality and poverty (Klapper et al., 2006; Segning et al., 2023). Furthermore, investing in human capital accumulation fosters financial literacy among previously disadvantaged people and enhances their ability to be innovative, creating business ideas that can be financed (Segning et al., 2023).

4.4.2 Non-linear Relationship Between Financial Inclusion and Income Inequality

In addition to the linear theories discussed above, there exists another strand of literature that advances the examination of the association between financial inclusion and income inequality by suggesting the presence of a non-linear connection between these variables. This section explains the non-linear models proposed by Greenwood and Jovanovic (1990) and Aghion and Bolton (1997).

4.4.2.1 Model of Greenwood and Jovanovic (1990)

Another study by Greenwood and Jovanovic (1990) proposed a related, but different model. Drawing from the insights of Kuznets (1955) hypothesis, which focuses on the relationship between the development stage of the economy and income inequality, through the transition from agriculture to industry, they explored the correlation between financial development and income distribution. Their model proposes a link between the development stage of the economy, financial sector development, and income inequality. This model suggests an inverted U-shaped relationship between the development of the financial system and income inequality, depending on the development stage of the economy. Income inequality increases at the early stages of development and decreases at a later stage of development before it stabilises in the long term. Therefore, the impact of financial inclusion on income inequality depends on economic development (Claessens & Perotti, 2007). Based on the growth and inequality model, inequality is high in the early stages of economic development. During this stage, the financial sector is at its infant stage, there is low economic growth, and financial markets are nearly non-existent and weak (Greenwood & Jovanovic, 1990). Due to the high costs of joining the financial market, only a few people, typically the rich, have access to formal financial products. Financial inclusion aims to broaden access to financial services and products, but in the presence of weak financial markets, this goal may unwittingly benefit the rich disproportionately. This is because the financial system tends to channel capital to individuals with collateral and a great chance of repaying the loan, thereby excluding the poor from accessing financial products and widening income inequality (Clarke et al., 2006).

However, as the economy develops toward maturity, the financial sector develops, thereby increasing economic growth. This is because, by maturity, the economy has developed a large structure for financial markets. During this stage, more people join the financial markets and have access to financial services, thus reducing income inequality (Claessens & Perotti, 2007; Clark et al., 2003; Nikoloski, 2012; Kapingura, 2017). In the final stage of economic development, income distribution stabilises, the savings rate declines, and economic growth transitions in a non-monotonous manner to a level that is higher than the infancy stage (Greenwood & Jovanovic, 1990). The notion of non-monotonicity is supported by Townsend and Ueda (2006), who propose that the movement of income inequality is non-monotonic (financial deepening and economic growth are also non-monotonic) along the development path. In other words, income inequality, financial deepening and economic growth can initially increase, then decrease and increase again as it moves towards the steady state.

Similarly, in line with the models proposed by Clarke et al. (2003) and Greenwood and Jovanovic (1990), it is suggested that during the infancy stage of the financial sector, individuals face fixed membership costs that hinder low-income individuals from joining the financial markets. Assuming that poor people save less and accumulate wealth more slowly, the gap between high-income members of the financial market and the low-income people excluded will widen, resulting in an increase in income inequality. However, as the financial sector progresses towards maturity, together with fixed membership costs, all individuals eventually gain access to the financial markets. Their model speculates an existence of the inverted U-shaped relationship between financial development (or financial inclusion) and income inequality, where income inequality first increases, then decreases, before it stabilises as more people join the financial market. Overall, this model paints a picture of non-linearity that is manifested during the evolution of income inequality and financial inclusion (or financial development) across the development stages of the economy (Claessens & Perotti, 2007; Clarke et al., 2003; Clark et al., 2006).

4.4.2.2 Model of Aghion & Bolton (1997)

In a similar vein, Aghion and Bolton (1997) suggest a different perspective, asserting that the accumulation of capital fosters financial access, which in turn reduces the income gap. The impact of capital accumulation on the distribution of income and wealth shares similarities with the dynamics of the Kuznets curve. In the early stages of economic development, borrowing terms favour lenders, leading to a rapid growth in wealth among the rich and widening income inequality. However, as economic development progresses, lending terms shift in favour of the borrowers, enabling a growing percentage of the impoverished to borrow and invest in individual projects, leading to reduced inequality. The Kuznets effect manifests in the capital market due to imperfections in the market. The model focuses on borrowing and lending within the capital market, assuming the endogenous determination of the interest rate (cost of borrowing) – a crucial factor in explaining the effects of capital accumulation on income distribution. As stated by Aghion and Bolton (1997: 152), "*when the interest rate schedule is determined endogenously, it is no longer possible to simply trace the wealth of a single individual in isolation from the rest of the economy, since the stochastic evolution of her wealth depends on the evolution of the state of the economy through the equilibrium interest rate schedule. As a result, the dynamics of an individual's wealth are now non-linear*".

Individual wealth dynamics show non-linearity due to random rates of return, moral hazard[9] problems and credit rationing, particularly affecting borrowers, who are predominantly poor. According to Aghion and Bolton (1997), this phenomenon, as suggested by Piketty (1993), arises from insufficient rates of accumulating capital for the economy to converge to a unique distribution of wealth. Instead, multiple steady state distributions persist, with a large number of people at low levels of wealth compared to fewer wealthier individuals. As a result, poor people tend to borrow to invest (more than the rich individuals) at a higher cost due to credit rationing[10], contributing to a stationary distribution with high inequality. This perpetuates the cycle of poverty and inequality, exacerbated by moral hazard in the presence of wealth constraints among borrowers. As a result, the capital market will supply insurance under stringent measures, thus causing the economy to transition towards an unequal distribution of wealth (income) (Piketty, 1993).

4.4.3 Summary of Theoretical Literature Review

This section conducted a review of theoretical literature on the relationship between financial inclusion and income distribution. To understand the nature of these variables, the study discussed various definitions, dimensions (such as access, usage, quality, cost, availability and penetration) and indicators of financial inclusion. This approach provided a clear interpretation of this complex concept and enhanced the understanding of it. In addition, the study provided the definition of income inequality, discussed its various aspects and measures such as the Gini coefficient, the Palma ratio, the Theil index and the Atkinson index. Despite income inequality having a unified definition, the literature revealed its complex nature pertaining to its aspects and measures. Furthermore, based on the above background, there is theoretical justification for the existence of a link between financial inclusion and income inequality. Theoretical literature identified two strands of literature that explain the transmission mechanism between financial inclusion and income distribution. The first strand of literature presented the association based on a linear framework. The linear models revealed various channels, such as capital accumulation, the labour market, income-generating activities and education, through which financial inclusion affects income distribution.

[9] Moral hazard is defined as the behaviour that increases loss arising from insurance (Rowell & Connelly, 2012). This occurs in situations where an individual provides misleading information when entering a contract.

[10] Credit rationing refers to a situation whereby the lenders of capital supply lower funds than the borrower's demand at a set quoted rate (Jaffee, 1989).

The second strand of literature proposed the existence of a non-linear connection between financial inclusion and income inequality. These studies revealed that the association between these variables is non-monotonic along the development path (Townsend & Ueda, 2006). In other words, income inequality and financial inclusion can rise, then fall and rise again as it moves towards the steady state. These strands of literature provide the theoretical justification for a positive, negative or a non-linear connection between financial inclusion and income inequality.

4.5 Financial Inclusion and Income Inequality: Empirical Review

As shown by theoretical studies, the relationship between financial inclusion and income inequality remains ambiguous. This section of the study provides a review of existing empirical studies on the relationship between financial inclusion and income inequality across the regions. The studies included in the review are classified according to developing and a combination of developed and developing countries, informed by the World Bank's classification. The World Bank classifies countries by their level of development based on Gross National Income per capita (Hamadeh, Van Rompaey & Metreau, 2023). According to Ray, Das and Das (2016), a country is classified as a developed country if it is highly industrialised, has a high Human Development Index (HDI), good infrastructure and other capital investments, a high level of literacy, good governance, and an advanced standard of living. These countries have an income that is above $12,615 and are also known as high-income countries (Nielsen, 2011). On the other hand, developing countries are those with underdeveloped industries, a low HDI, poor-quality governance and a low standard of living (Ray et al., 2016). These countries are also known as emerging or transitional economies and are classified as low-, lower-middle income countries, and upper-middle income countries (Nielsen, 2011). The findings of these studies are mixed, with the majority confirming a negative relationship, while a few studies found a positive relationship, inconclusive or no association. These disparities may stem from differences in testing techniques, data sources, methodologies, and proxies employed to measure financial inclusion and income inequality. Consequently, there is a lack of consensus among the findings across the literature.

4.5.1 Empirical Evidence from Developing Countries

There have been a number of studies conducted on the connection between financial inclusion and income inequality in developing countries and they show diverse findings. To review these

findings, this section provides studies done across developing countries and studies done specifically in Africa.

A number of studies conducted in this region found a negative relationship. In their study, Park and Mercado (2015) investigated the effect of financial inclusion on poverty and income inequality in 37 developing Asian countries from 2004 to 2012. Using Fixed Effects (FE), the findings show that financial inclusion reduces income inequality. In addition, to reduce income inequality further, financial exclusion from low-income groups must be addressed. The relationship between financial inclusion, financial stability and income inequality was investigated in 47 Organisation of Islamic Corporations (OIC) countries during 2006 to 2016. Using dynamic OLS, FE, RE, GMM, and quantile regression, the study found that financial inclusion positively affects financial stability, while it reduces income inequality. This suggests that an increase in financial inclusion will improve financial system stability and reduce the income disparity between the rich and the poor (Abdulkarim & Ali, 2019).

Using Two-stage Least Squares (2SLS), Le, Ho and Mai (2019) assessed the influence of financial inclusion on income inequality in 22 transition economies from 2005 to 2015. The study found that financial inclusion negatively affects income inequality. Zhang and Posso (2019) employed OLS and quantile regression estimation techniques to examine the contribution of financial inclusion to household income in 6,200 Chinese households. The data of the study were collected in the year 2011. The findings of the study show that financial inclusion increases household income across households with varying levels of income. In addition, the quantile regression results show that financial inclusion benefits low-income households more than rich households. Overall, the study concluded that financial inclusion is a significant mechanism that contributes to a reduction in income inequality. Ouechtati (2020) used FE, differenced GMM and system GMM to analyse the effect of financial inclusion on poverty and income inequality in 53 developing countries from 2004 to 2017. The results of the study confirmed a negative relationship between financial inclusion and income inequality. The effect of financial inclusion on economic growth, poverty, income inequality and financial stability was investigated in 10 Asian developing countries over the period 2009 to 2018. Using dynamic GMM, the study found that financial inclusion (through commercial banks, number of accounts and savings accounts) reduces income inequality (Ratnawati, 2020). Azim (2022) investigated the impact of financial inclusion on poverty reduction and income inequality in eight South Asian economies from 2004 to 2020. The study employed Cross-Sectional

Augmented Autoregressive Distributed Lag (CS-ARDL) models. The findings confirmed a reducing effect of financial inclusion on income inequality both in the short and long run.

Verma and Giri (2022) explored the role of financial inclusion on income inequality in 22 Asian countries during the period 2005 to 2019. The study used panel estimation techniques such as the Pedroni cointegration test, Kao residual-based test, Fully Modified Ordinary Least Squares (FMOLS), ARDL and Granger causality. The results showed that financial inclusion reduces income inequality in the long run, while it has no effect in the short run. In addition, the study found evidence of a unidirectional causality from financial inclusion to income inequality, which necessitates the need for policymakers to design policies that will improve financial access as a significant mechanism to reduce income inequality. Similarly, Chinnakum (2023) used GMM to estimate the relationship between financial inclusion, poverty and income inequality in 27 developing countries in Asia from 2004 to 2019. Their study found that financial inclusion contributes to a reduction in income inequality. Another study by Khan and Khan (2023) used FE, Pooled OLS and GMM to analyse the effect of financial inclusion on poverty, income inequality and financial stability in 69 developing countries from 2002 to 2020. The results showed a negative impact of financial inclusion on income inequality.

Other studies confirmed a positive relationship between financial inclusion and income inequality. In another study conducted in Turkey, Takmaz, Sari and Alatas (2022) analysed regional inequality of financial inclusion and its determinants. In addition, the study also investigated the effect of financial inclusion on provincial inequality. The study covered the period from 2004 to 2020 and employed ordered logit model. The results confirmed a positive relationship between financial inclusion and income inequality.

A number of these studies found differential results. In their study, Huang and Zhang (2019) explored the short and long run effects of financial inclusion on urban-rural income inequality in 30 provinces in China, covering the years from 1985 to 2013. Using the mean group (MG) estimator, FE, and pooled mean group estimator (PMG), the results of the study showed that financial inclusion widens the income disparity in the short run, while it reduces it in the long run. In another study, Ali, Khan, Wadood and Khan (2021) re-investigated the impact of micro and macro level financial inclusion on income inequality in 18 Asian countries during the period 1997 to 2017. The study used the GMM estimation technique, and they found that micro level financial inclusion has a negative effect on income inequality. In addition, the macro level

financial inclusion cannot solve unequal distribution of income because it has no effect on income inequality.

Similarly, Kling, Pesqué-Cela, Tian and Luo (2022) conducted a study on the theory of financial inclusion and income inequality in 29,733 households in China for the years 2011 and 2013. Using OLS, the findings of the study show mixed results. Financial access results in an increase in household income and improves the possibility of reduced income inequality in the future, while access to formal or informal credit reduces the level of income and worsens income inequality. Using data from five ASEAN countries, Wong, Badeeb and Philip (2023) analysed the role played by financial inclusion on poverty and income inequality during the period from 2008 to 2019. The study employed the CS-ARDL estimation technique and found that financial inclusion has no significant effect on income inequality, whereas financial inclusion coupled with financial innovation increases the income disparity. Later on, Md Jamil et al. (2024) examined the effect of financial inclusion on income inequality, considering the role played by an aging population in 73 developing countries from 2004 to 2019. Using the GMM, the study found that financial inclusion and an aging population has a negative but insignificant effect on income inequality. The results of the quantile regression show that financial inclusion and an aging population significantly reduce income inequality at low quantile levels.

Several studies have contributed to the ongoing discourse surrounding the relationship between financial inclusion and income inequality in developing nations, with a particular focus on the African context. Studies in this region mostly found a negative correlation. For example, Neaime and Gaysset (2018) studied the contribution of financial inclusion to income inequality and poverty. The study employed GMM and Generalised Least Squares (GLS) estimation techniques in eight MENA countries from 2002 to 2015. Their results show that financial inclusion has a negative effect on income inequality. Chinoda and Mashamba (2021) examined the impact of financial inclusion on income inequality in 25 African countries over the periods 2011, 2014 and 2017. Using structural equation modelling (SEM), the results documented that financial inclusion causes a fall in income inequality. Using system GMM, Menyelim et al. (2021) evaluated the effects of financial inclusiveness on curbing the impact of income inequality on economic growth in 48 SSA countries during the period 1995 to 2017. The findings of the study are contrary to the Kuznets curve, financial inclusion reduces income inequality in the short run. Another study by Khan et al. (2022) examined the impact of

financial inclusion on income inequality, poverty and financial stability in 54 African countries from 2001 to 2009. Using the system GMM, the study found that financial inclusion has a negative effect on income inequality.

Similarly, Kebede et al. (2023) examined the impact of financial inclusion on income inequality in 23 African countries from 2004 to 2018 using FE, quantile regression, instrumental variables (IV) and the Bayesian model. The results show that financial inclusion lowers income inequality. In addition, the study found that financial inclusion reduces income inequality at higher quantiles of income inequality. Furthermore, financial inclusion reduces income inequality in countries with good quality institutions. Seifelyazal et al. (2023) used a two-step system GMM to analyse the effect of financial inclusion on income inequality in 18 MENA countries from 2004 to 2019. Their study found that an increase in financial inclusion contributes to the reduction of income inequality.

On the contrary, other studies found a positive or no relationship between financial inclusion and income inequality. For instance, Tita and Aziakpono (2017) investigated the impact of financial inclusion and income inequality in 38 SSA countries. The study is based on the database of the World Bank Global Findex 2011 and applies the cross-sectional regression technique. The study shows that three of seven aspects of financial inclusion are positively related to income inequality. Ashenafi and Yan (2023) examined the nexus between financial intermediation, inclusion, FinTech and income inequality in 49 African countries. The period of the study included non-overlapping averaged data from 1980 to 2017 and financial inclusion and FinTech data from three survey data points: 2011, 2014 and 2017. Using FE, 2SLS and OLS, the results show that financial inclusion widens the income inequality gap. Whereas Agyemang-Badu et al. (2018) found no relationship between financial inclusion and income inequality in 48 African countries using the FE regression from 2004 to 2015.

Other studies found differential results. For example, Sawadogo and Semedo (2021) used the finite mixture and Instrumental Variables with Fixed Effects (IV-FE) models to analyse the effect of financial inclusion on income inequality in 28 SSA countries between 2004 and 2016. Their results found that the relationship differs across the groups. The grouping of countries into different classes assumes that the effect of financial inclusion on income inequality differs across countries with unobserved, but similar characteristics. First, they found no relationship between financial inclusion and income inequality in first-class countries, whereas in second-

class countries, financial inclusion lowers income inequality significantly. Later, in 2023, Segning et al. examined the effect of financial inclusion on income inequality, accounting for socio-cultural factors in 27 SSA countries from 2002 to 2015. The countries were grouped according to religion and official language. The study employed dynamic GMM and found that financial inclusion reduces income inequality across all countries in the sample, and in Christian-dominated and French-speaking countries. In addition, financial inclusion has no effect on income inequality in Islamic-dominated and English-speaking countries. Furthermore, it found an inverted U-shaped relationship between financial inclusion and income inequality across all countries considered, including Christian-dominated countries. Table 4.3 summarises the studies that examined the association between financial inclusion and income inequality in developing countries.

Table 4. 3: Summary of empirical studies on the effect of financial inclusion on income inequality in developing countries

Author(s)	Region or country	Year(s)	Method(s) used	Measure(s) of financial inclusion (constructed an index)	Measure(s) of income inequality	Control variables	Results
Negative impact							
Park and Mercado (2015)	37 Developing Asian countries	2004-2012	• FE	Index constructed based on: • ATM per 100,000 adults • Commercial bank branches per 100,000 adults • Borrowers from commercial banks per 1,000 adults • Depositors with commercial banks per 1,000 adults • Domestic credit to GDP ratio	Gini index	• Inflation • Primary school completion • Growth in bank claims • Growth rates • Rule of law	-
Neaime and Gaysset (2018)	Eight MENA countries	2002-2015	• GMM • GLS	• Number of ATMs per 100,000 adults • Number of commercial banks per 100,000 adults	Gini coefficient	• Gross enrolment ratio (secondary) • Labour force female • Population (in million) • Inflation • Age dependency ratio of working age • Trade openness • GDP per capita growth	-
Abdulkarim and Ali (2019)	47 Organisation of Islamic	2006-2016	• OLS • FE • RE	• ATMs • Bank branches per 100,000 adults	Gini coefficient	• Population growth rate • Inflation	-

	Corporations (OIC)		• Dynamic GMM • Quantile regression	• Deposit accounts with commercial banks		• Trade as a percentage of GDP • Age dependency ratio • GDP per capita growth	
Le et al. (2019)	22 Transition economies	2005-2015	• 2SLS	Index constructed based on: • ATMs per 100,000 adults • Commercial bank branches per 100,000 adults • Borrowers from commercial banks per 1,000 adults • Depositors with commercial banks per 1,000 adults	Gini index	• Rule of law, • GDP per capita, • Unemployment, • Domestic credit to the private sector as % of GDP • Dummy for fragility transition • Dummy for national income	-
Zhang and Posso (2019)	6200 Chinese households	2011	• OLS • Quantile regression	Index constructed based on: • Transaction (checking) • Saving account (debt, Equity) • Credit (loan, credit card) • Insurance (commercial insurance)	Income for household	• Family size • Age • Gender • Marriage • Education • Political status • ethnicity • Hukou • Rural-urban • Number of houses • Agriculture business • Proportion of children • Proportion of old and • Proportion of employed	-

Ouechtati (2020)	53 Developing countries	2004-2017	• FE • Differenced GMM • System GMM	• Account ownership: Measured as ATMs per 100,000 adults • Penetration rate of financial institutions: Measured as bank branches per 100,000 adults • Credit: Measured as commercial bank borrowers per 1,000 adults • Savings: Measured as commercial bank deposit accounts per 1,000 adults	Gini index	• GDP per capita • Cash payments for the government (% GPD) • Trade • Inflation	-
Ratnawati (2020)	10 Asian developing countries	2009-2018	• Dynamic GMM	• Number of bank accounts • Number of commercial bank branch offices • Number of commercial bank ATMs • Outstanding deposits with commercial banks • Outstanding loans from commercial banks	Gini coefficient	• Inflation	-
Chinoda and Mashamba (2021)	25 African countries	2011, 2014 and 2017	• SEM	• ATMs per 100,000 adults • Commercial bank branches per 100,000 adults	Gini coefficient	• GDP per capita • Trade openness, • Financial development index	-

				• Bank accounts per 1,000 adults • Outstanding loans to GDP			
Menyelim et al. (2021)	48 SSA countries	1995-2017	• System GMM	• Gross national income (GNI) per capita • Bank credit to bank deposits ratio • Private domestic credit from the financial institution • Private domestic credit from deposit money banks	• Gini coefficient • Palma ratio • Atkinson index	• Cell phone usage • Remittance • Average primary school enrolment ratio	Short run: -
Azimi (2022)	8 South Asian economies	2004-2020	• CS-ARDL	Index constructed based on: • The number of deposit accounts per 1,000 people • The number of depositors per 1,000 adults • The number of banks per 100,000 people • The number of ATMs per 100,000 adults • The number of loan accounts in banks per 1,000 people • The number of borrowers from banks per 1,000 people	Gini index	• Per capita real income • School enrolment ratio • Inflation • Rule of law • Credit to private sector • Trade openness • Information and communication technology • Final government expenditure • Ratio of mobile users	Short run: - Long run: -

Khan et al. (2022)	54 African countries	2001-2009	• System GMM	• Number of ATMs per 100,000 adults • Deposits with commercial banks per 1,000 adults	Gini index (gross national income inequality)	• Inflation • GDP per capita • Population growth • Trade openness • Financial integration	-
Verma and Giri (2022)	22 Asian countries	2005-2019	• Pedroni cointegration test • Kao residual-based test • FMOLS • ARDL • Granger causality	• The number of commercial banks branches for every 100,000 adults • The number of deposit accounts with commercial banks for every 1,000 adults • Outstanding loan from commercial banks to household sector • Domestic credit to the private sector	Gini index	• Per capita economic growth (GDP) • Inflation	Long run: - Short run:0
Chinnakum (2023)	27 Developing countries in Asia	2004-2019	• GMM	Index constructed based on: • ATMs per 100,000 adults • Commercial bank branches per 100,000 adults • Borrowers from commercial banks per 1,000 adults • Depositors with commercial banks per 1,000 adults	• Gini index (%) • Income quintile share ratio	• Growth rate of GDP per capita at constant prices • Secondary school enrolment ratio • Population growth rate • Inflation rate • The degree of trade openness	-

				• Domestic credit to private sector (% of GDP) • Foreign banks among total banks (%) • Bank concentration (%) • Bank non-interest income to total income (%)			
Kebede et al. (2023)	23 African countries	2004-2018	• FE • Quantile regression, • Instrumental variables • Bayesian model	Index constructed based on: • The number of bank branches per 100,000 adults • ATMs per 100,000 adults • The number of bank branches per 1,000 km^2 • ATMs per 1,000 km^2 • The number of deposit accounts with commercial banks per 1,000 adults • Depositors with commercial banks per 1,000 adults • Domestic credit to the private sector by banks (% of GDP)	Gini (disposable) coefficient	• GDP per capita • GD growth • Inflation • Trade • Remittance • Government expenditure • Natural resource rent • Urbanisation • Education	-
Khan and Khan (2023)	69 Developing countries	2002-2020	• FE • Pooled OLS	• ATMs per 100,000 adults	Gini index	• Population • Inflation rate	-

			• GMM	• Deposit with the commercial bank (DCB per 1,000 adults)		• GDP per capita • Trade openness • Secondary enrolment ratio • Age dependency ratio • Financial integration	
Seifelyazal et al. (2023)	18 MENA countries	2004-2019	• Two-step system GMM	Index constructed based on: • Number of commercial bank branches per 100,000 adults • Number of ATMs per 100,000 adults • Number of commercial bank branches per 1,000 km^2 • Number of ATMs per 1,000 km^2 • Number of deposit accounts with commercial banks per 1,000 adults • Getting credit	Gini index	• Unemployment • Education	-
Positive impact							
Tita and Aziakpono (2017)	38 SSA countries	2011	• Cross-sectional regression technique	• Account ownership • Account use for business • Electronic payment • Loans from formal financial institutions • Formal loans to pay school fees • Health insurance	Gini coefficient	• Governance index • Inflation rate • Gross national income per capita • GDP per capita annual growth • Education	+

				• Formal savings			
Takmaz et al. (2022)	Turkey	2004-2020	• Ordered logit models	Index constructed based on: • Deposit per capita • Number of bank branches per 100,000 people • Loan per capita	Gini coefficient	• Population • Literacy rate • Mobile penetration • Unemployment • Income (GDP)	+
Ashenafi and Yan (2023)	49 African countries	1980-2017 2011, 2014, and 2017	• FE • 2SLS • OLS	• Domestic credit to the private sector by banks (% of GDP) • Stock market total value traded to GDP (%)	Gini disposable	• GDP growth (annual %) • Inflation • Foreign direct investment net inflows (% of GDP) • Trade • Urban population growth • Manufacturing value added	+
No relationship							
Agyemang-Badu et al. (2018)	48 African countries	2004-2015	• FE	Index constructed based on: • ATMs per 100,000 adults • Commercial bank branches per 100,000 adults • Borrowers from commercial banks per 1,000 adults • Depositors with commercial banks per 1,000 adults	Palma ratio	• Education • Private credit provided by banks as a percentage of GDP • GDP per capita growth • Rule of law	0
Differential impact							

Huang and Zhang (2019)	30 Provinces in China	1985-2013	• Mean group (MG) estimation • FE • Pooled mean group estimator (PMG)	Index constructed based on: • The number of banking employees per 10,000 km^2 • The number of bank branches per 10,000 km^2 • The number of banking employees per 10,000 population • The number of bank branches per 10,000 population • Deposit per capita • Credit per capita	Urban–rural income inequality	• The financial scale (the ratio of the deposit and credit balances held by financial institutions over the provincial GDP • The financial efficiency (the number of credits relative to the deposits held by financial institutions)	Short run: + Long run: -
Ali et al. (2021)	18 Asian countries	1997-2017	• GMM	Index constructed based on: • Number of deposit accounts with commercial banks per 100,000 population • Number of borrower accounts with commercial banks per 100,000 of population • Number of commercial banks per 100,000 population • Private Credit to GDP • Financial system • Insurance premium	Gini coefficient	• Inflation • Government effectiveness • Employment • School enrolment • Government spending to GDP	Micro level: - Macro level: 0

				to GDP			
Sawadogo and Semedo (2021)	28 SSA countries	2004-2016	• Finite mixture model • IV-FE	Index constructed based on: • ATM per 100,000 adults • Commercial bank branches per 100,000 adults • Bank accounts per 1,000 adults	Gini index	• Agriculture value added to the gross domestic product (GDP) • Manufacture value added to the GDP • The share of the population living in rural areas • The percentage of arable land • The ratio of urban population to total population • The human assets index • The percentage of the population with access to electricity • Remittances to the GDP	First class: 0 Second class: -
Kling et al. (2022)	29 733 Households in China	2011 and 2013	• OLS	Index constructed based on: • Individuals have checking accounts and time deposits • Dummy for taking a formal loan • Dummy for taking an informal loan • Amount of formal debt from banks	Individual income Dummy for farming income Dummy for business income	• Age (Age in years) • Female (Dummy takes one for females) • Location: Province; rural (Dummy for rural regions)	Financial access: - Access to formal or informal credit: +

				• Amount of informal debt • Annual interest rates on formal loans • Annual interest rates on informal loans			
Segning et al. (2023)	27 SSA countries	2002-2015	• Dynamic GMM	Index constructed based on: • Number of bank accounts per 1000 inhabitants • Bank deposits or savings • The number of branches per 10,000 inhabitants • Credit to the private sector as a percentage of GDP	Gini index	• GDP per capita • Value added of the manufacturing sector to GDP • Quality of institutions and governance • Enrolment rate, primary and secondary (gross), gender parity index • Consumer price inflation • Government spending • Trade openness	Entire sample: - Christian-dominated and French-speaking: - Islamic-dominated and English-speaking countries:0
Wong et al. (2023)	Five ASEAN countries	2008-2019	• CS-ARDL	Index constructed based on: • The number of bank branches per 1,000 km^2 • Number of ATMs per 1,000 km^2 • Number of bank branches per 100,000 adults • Number of ATMs per 100,000 adults	Gini index	• Inflation • Unemployment rate	Financial inclusion:0 Financial inclusion and innovation: +

				• Outstanding deposits with commercial banks as a percentage of GDP • Outstanding loans with commercial banks as a percentage of GDP • M2 to GDP ratio			
Md Jamil et al. (2024)	73 Developing countries	2004-2019	• GMM • Quantile regression	Index constructed based on: • The number of deposit accounts per 1,000 adults (DEP) • The number of bank automated teller machines per 100,000 adults • The outstanding loan accounts over the gross domestic product	Gini Coefficient index	• The population aged 65 over the total population (AGE1) • The old-age dependency ratio (AGE2) • Gross domestic product per capita • Human capital (life expectancy) • Government expenditure • Inflation	GMM: 0 Quantile regression: -

Source: Compiled by the author. Note: - denotes negative; + denotes positive; 0 denotes no relationship. Fixed effect (FE), Generalised Method of Moments (GMM), Ordinary Least Squares (OLS), Structural Equation Modelling (SEM), Generalised Least Squares (GLS), Cross-Sectional Augmented Autoregressive Distributed Lag (CS-ARDL), Organisation of Islamic Corporations (OIC), Fully Modified Ordinary Least Squares (FMO), Instrumental Variables with Fixed Effects (IV-FE)

4.5.2 Empirical Evidence from Developed and Developing Countries

Given the role of financial inclusion in reducing income inequality, there has been an increase in studies exploring the relationship between these variables across countries. The evidence from these studies is mixed. The majority of the studies confirm a negative relationship, while some find a differential or no relationship between these variables.

For instance, among the studies that found a negative association, Kim (2016) used FE and GMM to analyse the role played by financial access on income inequality and economic growth across 40 countries that are members of the OECD and European Union (EU) from 2004 to 2011. The study divided the countries into low- and high-income countries and into low- and high-financial fragility countries. The results of the study confirmed a negative effect of financial access on income inequality in low-income countries and in high-financial fragility countries. In addition, the negative effect of financial access on income inequality improves the relationship between income inequality and economic growth by changing the negative effect of income inequality on economic growth into a positive one. Similarly, Turégano and García-Herrero (2018) analysed the impact of financial inclusion and the size of the financial sector on income inequality across 150 countries by controlling for economic development and fiscal policy in 2000, 2004 and 2011. Using OLS, financial inclusion reduces income inequality to some extent, whereas the size of the financial sector does not contribute to a reduction in income inequality.

Mushtaq and Bruneau (2019) used IV and GMM regressions to explore the role of microfinance, financial inclusion and Information and Communication Technologies (ICT) on poverty and income inequality in 62 countries over the period 2001 to 2012. The study found that financial inclusion (measured by microfinance and commercial banks) reduces income inequality. Using OLS, GLS, GMM, and 2SLS techniques, Fouejieu et al. (2020) studied the relationship between financial inclusion and inequality from 2004 to 2015. The study was conducted based on a large sample of developed and developing countries. The study confirmed that financial inclusion decreases income inequality. Omar and Inaba (2020) conducted a panel study investigating whether financial inclusion reduces poverty and income inequality from 2004 to 2016. Using the FE model in 116 developing countries, their results revealed that financial inclusion negatively affects income inequality.

Using pooled OLS, a parsimonious model and quantile regression, Demir et al. (2022) examined the relationship between FinTech, financial inclusion and income inequality in 140 countries covering the years 2011, 2014 and 2017. The results show that financial inclusion reduces income inequality at all quantiles of unequal distribution. In addition, the results reveal that FinTech reduces income inequality through financial inclusion. In another study, Tsouli (2022) used the FE, RE and GMM to investigate the impact of financial inclusion on poverty and income inequality from 2004 to 2019 in 30 European countries. The study shows that financial inclusion has a reducing effect on income inequality. Using a two-way FE, Fu and Liu (2023) examined the relationship between access to financial services and income inequality across 119 countries over the period from 2004 to 2018. The findings show that access to financial services negatively affects income inequality, especially in less developed countries. That is, increased access to financial services reduces income inequality.

On the other hand, other studies did not find evidence of a relationship between financial inclusion and income inequality. For example, Park and Mercado (2016) assessed the effect of financial inclusion on poverty and income inequality across 177 countries (including 37 countries from developing Asia) from 2004 to 2012. Using the FE method, the results show that financial inclusion has no effect on income inequality for the entire sample of economies. Similarly, in their latest paper, Park and Mercado (2018) assessed the impact of financial inclusion on poverty and income inequality across countries using data for the years 2011, 2014, and 2017. They did this by constructing a new financial inclusion index for 151 economies, using the PCA method and a cross-sectional approach. The results show that financial inclusion has no significant effect on income inequality for the entire sample

Other studies that intended to establish whether financial inclusion influences income inequality found differential evidence. In their paper, Sukmana and Ibrahim (2018) employed OLS and quantile regression in 73 countries from 2001 to 2007 to examine the financial access-inequality nexus. The OLS results show that an increase in financial access lowers income inequality. The quantile regression results show a negative effect between the variables for countries with low or mild income inequality, while financial access may not reduce income inequality in highly unequal countries. Using the FE technique, Tsouli (2022) re-investigated the impact of financial inclusion on poverty and income inequality. The study was conducted in 122 countries, including high-, upper-middle-, lower-middle- and low-income economies covering the period from 2014 to 2019. The results show that financial inclusion does not affect

income inequality in upper-middle- and low-income countries. On the other hand, financial inclusion effectively reduces income inequality in high- and lower-middle-income countries. Table 4.4 summarises the empirical findings on the relationship between financial inclusion and income inequality in developed and developing countries.

Table 4. 4: Summary of empirical studies on the relationship between financial inclusion and income inequality in developed and developing countries

Author(s)	Region or country	Year(s)	Method(s) used	Measure(s) of financial inclusion	Measure(s) of income inequality	Control variables	Results
Negative impact							
Kim (2016)	40 Countries	2004-2011	• FE • GMM	Index constructed based on: • The number of bank accounts (per 1,000 adults) • The number of bank branches (per 1 million people) • The number of ATMs (per 1 million people) • The ratio of the amount of bank credit and bank deposits to GDP	Gini coefficient	• Rate of unemployment • Inflation • Population growth • The ratio of income tax • Ratio of government social expenditure to GDP	Low-income countries: - high fragility countries: -
Turégano and García-Herrero (2018)	150 Countries	2000, 2004 and 2011	• OLS	• Credit to SME's (% GDP) • Credit to SMEs (%loans) • Adults with account (%) • Honohan (2007) index • Sarma (2008-2 dim) • Sarma (2008-3 dim) • Sarma (2012) index	Gini (disposable) index	• GDP per capita • Ratio of government Consumption over GDP • Trade Openness • Credit to Private Sector	-

				• Cámara & Tuesta (2014) index			
Mushtaq and Bruneau (2019)	62 Countries	2001-2012	• IV • GMM	• Commercial bank deposits borrowers per head • Loans per head • Credit/GDP ratio	Gini coefficient	• Real GDP per capita • The ratio of (Credit/GDP) • Final government consumption (%GDP) • Share of arable land • Political rights, • Index of civil liberties • Trade openness • Cost of contract enforcement	-
Fouejieu et al. (2020)	Developed and developing countries	2004-2015	• OLS • GLS • Dynamic GMM • 2SLS	• The number of ATMs per 100,000 adults • The number of branches of commercial banks per 100,000 adults	Gini index	• Inflation • Trade openness • Infrastructure • Population • Remittances • Education • Rule of law • Dummy for income per capita levels	-
Omar and Inaba (2020)	116 Developing countries	2004-2016	• FE	Index constructed based on: • Number of deposit accounts with financial institutions per 1,000 adults • Number of depositors with	Gini coefficient	• Per capita real GDP • Rule of law • Inflation rate • Secondary school enrolment ratio • Credit to the private sector by banks	-

				financial institutions per 1,000 adults • Number of financial institution's branches per 100,000 adults • Number of ATMs per 100,000 adults • Number of loan accounts with financial institutions per 1,000 adults • Number of borrowers from financial institutions per 1,000 adults		• Government expenditure • Trade openness • ICT service exports • Mobile cellular users	
Demir et al. (2022)	140 Countries	2011, 2014 and 2017	• Pooled OLS • Parsimonious model • Quantile regression	• The share of the adult population (aged 15+) owning an account at a formal financial institution • The proportion of adults saving at a formal financial institution • The share of the adult population borrowing from a formal financial institution	Gini coefficient (disposable)	• GDP per capita (annual %) • Trade • Inflation (CPI) • Government spending • Education (secondary school enrolment rate) • Population growth	-
Tsouli (2022)	30 European countries	2004-2019	• FE • RE • GMM	Index constructed based on:	Gini index	• Inflation (CPI) • School enrolment • Gender ratio	-

				• The number of commercial banks credit union per 100,000 Adults • Number of ATMs per 100,000 adults • Outstanding deposits with commercial banks (% of GDP) • Outstanding loans from commercial banks (% of GDP)		• Trade openness • GDP growth • Dummy for income group combination between poverty and financial inclusion	
Fu and Liu (2023)	119 Countries	2004-2018	• Two-way FE	• The number of commercial bank branches per 100,000 adults • The number of ATMs per 100,000 adults	• Gini coefficient • The share of the highest 10% group • The share of the highest 20% group	• Growth of GDP per capita (%) • Growth of population (%) • Expected years of education • Tax (Tax / GDP (%)) • Trade	-
No relationship							
Park and Mercado (2016)	177 Countries	2004-2012	• FE	Index constructed based on: • Number of ATMs per 100,000 adults • Number of commercial bank branches per 100,000 adults • Borrowers from commercial banks per 1,000 adults	Gini coefficient	• Inflation • Primary school completion • Growth in bank claims • GPD growth • Rule of law	0

				• Depositors with commercial banks per 1,000 adults • Domestic credit to GDP ratio			
Park and Mercado (2018)	151 economies	2011, 2014, and 2017	• Cross-sectional approach	Index constructed based on: • The percentage of the adult population with financial accounts to total population • Proportion of the adult population with credit and debit cards • The percentage share of the adult population with a mobile money account • The number of commercial bank branches per 100,000 adults • The number of ATMs per 100,000 adults, • The share of the adult population who borrowed and saved from a financial institution • Domestic credit to GDP ratio	Gini coefficient	• Education completion • GDP growth rates	Full sample: 0
Differential impact							

Sukmana and Ibrahim (2018)	73 Countries	2001-2007	• OLS • Quantile regression	• Honohan (2008) access indicator	Household income inequality data	• Real GDP per capita • Trade • Infrastructure • Corruption control index	OLS results: - Low-income inequality: - High-income inequality: 0
Tsouli (2022)	122 Countries	2014-2019	• FE	• Deposit account with commercial banks per 1,000 adults • The number of registered mobile money accounts per 1,000 adults • The number of branches per 100,000 adults • ATMs per 100,000 adults • Mobile money agent outlets per 100,000 adults • Outstanding deposits with commercial banks (% of GDP) • The outstanding loans from commercial banks (% of GDP) • The value of money transactions (% of GDP)	Gini index	• Inflation • Primary education completion • Bank claims growth • GDP growth • Rule of law • Combination between poverty and financial inclusion	Upper-middle- and low-income countries: 0 High- and lower-middle-income countries: -

Source: Compiled by the author. Note: - denotes negative; + denotes positive; 0 denotes no relationship. Fixed effect (FE), Generalised Method of Moments (GMM), Ordinary Least Squares (OLS), Generalised Least Squares (GLS), Two-Stage Least Squares (2SLS)

4.5.3 Summary of Empirical Literature Review

As observed in the existing literature, a substantial number of studies adopted the linear approach to investigate the nexus (i.e. negative or positive relationship between financial inclusion and income inequality) between these variables. The reviewed literature covered developing countries (i.e. emerging and transitional economies) and developed countries (i.e. advanced economies). The majority of studies uniformly employed a single proxy (i.e. the Gini coefficient) to measure income inequality, while a few studies used more than one proxy, such as the Palma ratio, the Theil index and income per household. On the other hand, the proxies used to measure financial inclusion varied across the studies. Some studies employed a single proxy, while others included many indicators, such as commercial banks, ATMs, commercial bank deposits, borrowers and domestic credit to private sector, and some indexes were adopted from other studies. These proxies were used individually or used to construct an index to investigate the impact. Empirical methodologies employed varied across the studies, but mostly employed GMM and FE, while a few researchers employed quantile regression and ARDL, among others. The use of the control variables also varied across the countries, but mostly included trade openness, inflation, education, GDP growth, real GDP per capita, government spending and population.

Empirical research on the negative association between financial inclusion and income inequality has shown that an increase in financial access and use of formal financial products and services may reduce income inequality. This implies that increasing financial inclusion will enhance financial system stability and reduce the income disparity between the rich and the poor (Abdulkarim & Ali, 2019). On the other hand, studies on the positive effect argue that increasing access to formal financial products and services will exacerbate unequal distribution. This suggests that improving access to formal financial services and products, such as physical service points and debit cards, may widen income inequality if only a few people gain access to them (Tita & Aziakpono, 2017). According to the literature, which shows no association, improving financial inclusion may have no effect on income inequality due to factors such as insufficient income, discrimination, market failures and imperfections (Park & Mercado, 2016). Regarding the differential impact, a number of studies revealed that the increase in financial inclusion has various effects (i.e. positive, negative or no association) depending on the development stage of the

country, the quality of institutions, the belief system, social classes, the combination of variables employed, the estimation method used, and the structure of the financial system.

4.6 Gap in the Literature

Apart from the limited number of studies on the relationship between financial inclusion and income inequality in Africa, this study identified several gaps in the reviewed literature. First, studies conducted in this region mostly used single variables and did not investigate the relationship across both aggregated dimensions and the composite index. A single study could be identified as having employed both dimensions and an index (see Kebede et al., 2023). However, their study focused on usage, outreach and an index covering 23 African countries from 2004 to 2018. Other studies conducted in the region used the index alone. For example, Seifelyazal et al. (2023) used an index based on access and usage aspects in 18 MENA countries from 2004 to 2019. Sawadogo and Semedo (2021) used an index constructed from the access dimension across 28 SSA countries from 2004 to 2016. On the other hand, Segning et al. (2023) constructed an index using measures of penetration and usage from 2002 to 2015 across 27 SSA countries. The significance of using both dimensions and the overall index rather than individual proxies stems from the multidimensional nature of financial inclusion and the corresponding definitions. In addition, it captures the overall aspect of financial inclusion and its broader impact. In this regard, the results do not adequately show the nexus between these variables.

Second, there remains a noticeable lack of research examining the effect of financial inclusion on income inequality at varying levels of income inequality across countries. For instance, a single study by Kebede et al. (2023) is ascertained to have been conducted in Africa, covering the period 2004 to 2018. Studying this effect is important because of Townsend and Ueda's seminal work of 2006, which presents the movement of income inequality along the development path. In addition, notable insights from the African Development Bank's 2012 report revealed a range of inequalities within Africa, with the Southern subregion emerging as the most unequal and North Africa showing comparatively lesser inequality. The failure of studies to account for income disparities within the region offers a narrow outlook on the welfare effects of increasing access to formal financial products and services, particularly in countries marked by different income inequality levels.

Third, there is a lack of studies examining the effect of financial inclusion on income inequality within the Greenwood and Jovanovic (1990) theoretical framework in Africa. The hypothesis has primarily been examined within the context of financial development rather than financial inclusion (see Ang 2010; Clarke et al., 2003, Clarke et al., 2006; Islam, 2015; Kapingura, 2017; Rehman et al., 2008). The only studies that considered financial inclusion in a non-linear fashion were conducted by Fouejieu et al. (2020), covering a large sample of developed and developing countries during the period from 2004 to 2015, and by Segning et al. (2023), focusing on 27 SSA countries from 2002 to 2015. The aspect of non-linearity is important, since the movement of income inequality and financial deepening (inclusion) can vary along the development path, they can increase, then decrease, and increase again (Townsend & Ueda, 2006). This study aims to fill in these gaps.

4.7 Conclusion

This chapter provided a review of theoretical and empirical literature on the association between financial inclusion and income inequality. Based on the literature reviewed, it is evident that financial inclusion has various effects on income inequality. Theoretical literature revealed that the concept of financial inclusion is complex in nature and cannot be understood by using a narrow definition. The concept can best be understood based on a definition that considers various aspects such as financial access, availability, penetration, usage, cost and quality. These sets of indicators help us understand the complex nature of financial inclusion in depth and its effect on macroeconomic variables. The G20 has endorsed a number of these indicators as measures of financial inclusion (as presented in Table 4.2), motivated by the development of new digital models to provide financial services and products, along with the availability of new data on both the provision and demand for financial services and products.

In addition, theories regarding income inequality showed their complexity. While it may have a unified definition, it can be perceived through different aspects, including unequal returns to factors of production, unequal distribution of income, inequality in opportunities and intergenerational inequality. The aspect of income inequality is often quantified using the most popular measures found in literature, including the Gini coefficient, Palma ratio, Theil index and Atkinson index. Furthermore, theoretical literature reported linear and non-linear theoretical

mechanisms that enable the association between financial inclusion and income inequality. Studies on the linear association revealed that capital accumulation, labour market, entrepreneurial activities and accumulation of human capital (through education and training) are the channels through which financial inclusion affects income inequality. On the other hand, other studies argued that the correlation between financial inclusion and income inequality occurs through a non-linear association. It reveals that the relationship depends on the development stage of the economy, where there can be a positive association at early stages and a negative association at later stages of economic development.

Empirically, the studies have shown diverse findings on the impact of financial inclusion on income inequality. Based on the results reported above, mostly, the findings agree on a negative association between financial inclusion and income inequality, while a few studies reach consensus on either a positive, inconclusive or no association between the variables. The mixed findings may be due to various estimation methods used, different study lengths and data sets, and various proxies of financial inclusion and income inequality used. Studies across and within regions mostly found that financial inclusion could reduce income inequality under several factors. For example, some studies found that the reducing effect of financial inclusion on income inequality tends to be experienced by countries with less developed financial systems, higher quantiles of income inequality and good quality institutions. Other studies found that the effect may vary from negative to positive, inconclusive or no relationship depending on the development stage of the country, financial structure, geographical factors such as the age of the population, the level of financial literacy, and the belief systems. Furthermore, it is shown that the impact of financial inclusion on income inequality is enabled by factors such as financial stability, FinTech, fiscal policy and economic development.

Given the above analysis, it is shown that there are many studies on the association between financial inclusion and income inequality, which are mostly focused on cross-country analysis (including developed and developing countries). However, few studies examine the relationship using both dimensions and an index of financial inclusion in Africa. In addition, the analysis above shows that the impact of financial inclusion on income inequality at varying levels of income inequality, as well as the non-linear effect, has received minimal attention. Moreover, existing

studies used unbalanced data[11], excluded significant indicators and included variables that are not uniformly categorised based on dimensions. These identified gaps serve as the motivation for this study.

[11] An unbalanced dataset is a dataset that has missing values and does not have the same number of observations in all the periods (Biørn, 2016).

CHAPTER 5
METHODOLOGY OF THE STUDY

5.1 Introduction

The primary aim of this study is to assess the impact of financial inclusion on income inequality in 25 African countries. This chapter presents the research design, data sources, and econometric techniques employed to examine the relationship between financial inclusion and income inequality. This study employs secondary data and quantitative techniques to address this critical research objective. The chapter is organised into seven sections. After the introduction, section 5.2 discusses the availability of data, the justification of the variables, the expected signs, and the sources of the data. The model specification that informs the investigation of the relationship between financial inclusion and income inequality is provided in section 5.3. Before the study examines the impact of financial inclusion on income inequality, the measure of financial inclusion is identified. In section 5.4, the PCA that is used to construct the financial inclusion indices is discussed. Section 5.5 presents the preliminary tests, including the descriptive statistics, cross-sectional dependency test, unit root testing, heteroskedasticity, multicollinearity, and serial correlation tests. In section 5.6, estimation techniques including the two-step system GMM, the quantile regression and the non-linear two-step system GMM are presented. Lastly, section 5.7 concludes the chapter.

5.2 Description of Data and Variables

5.2.1 Availability of the Data and Ethical Considerations

The study uses data from 25 African[12] countries covering the period from 2006 to 2022. The availability of data determines the period covered and the number of countries under investigation. The study uses annual time series data extracted from various sources, including the Fraser Institute Economic Freedom Dataset (2025), the World Inequality Database (2025), the UNU-WIDER-World Income Inequality Database (2024), the Financial Access Survey by the International Monetary Fund (2024), World Bank Group (2022b), World Development Indicators (2024) and World Development Indicators (2025). During data collection, the study found that

[12] The 25 developing countries in Africa under investigation are Algeria, Botswana, Burundi, Cameroon, Congo Republic, Egypt, Eswatini, Gambia The, Ghana, Guinea, Kenya, Lesotho, Madagascar, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Rwanda, Seychelles, South Africa, Tanzania, Uganda, Zambia and Zimbabwe.

some of the variables had missing observations. Therefore, the study used linear interpolation to impute the missing observations. Linear interpolation is a widely adopted method for estimating unknown values using a linear connection between known data points, specifically when data includes missing values (Xu, 2024).

The study obtained ethical clearance from the College of Economic and Management Sciences Research Ethics Committee. The research relies exclusively on secondary data from publicly available and reputable databases. As such, no primary data involving human participants was collected, and no personal or sensitive information was used. The study adheres to responsible data handling standards by ensuring that all data are accurately reported, properly cited, and used solely for academic purposes. No data manipulation or misrepresentation was undertaken. Furthermore, the data are aggregated at the country level, which eliminates concerns related to confidentiality and privacy. The analysis was conducted objectively to avoid bias and maintain the integrity and transparency of the research process.

5.2.2 Variable Definition and Justification

5.2.2.1 Dependent Variables – Income Inequality

To investigate the impact of financial inclusion on income inequality, the estimation model uses income inequality as the dependent variable, following studies by Ali et al. (2021), Chinoda and Mashamba (2021), and Demir et al. (2022). To measure income inequality, this study employs two proxies: (i) the Gini coefficient (see Azim, 2022; Le et al., 2019; Park & Mercado, 2015), and (ii) the Palma ratio (see Agyemang-Badu et al., 2018; Cobham et al., 2015; Menyelim et al., 2021). The Gini coefficient is derived from the Lorenz curve, which plots the percentage of earned income against the percentage of cumulative population (Deiniger & Squire, 1996; De Maio, 2007). According to the literature, the Gini coefficient is a widely used measure of income distribution among the population. It ranges between 0 (perfect equality) and 1 (perfect inequality), where a high value denotes high-income inequality measured in terms of gross or disposable income (Kebede et al., 2023).

At the same time, there is a growing interest in using the Palma ratio as an alternative measure of income inequality. This is because, although the Gini coefficient reflects income distribution to

some extent, it does not show the well-being of low-income people (Menyelim et al., 2021; Naceur & Zhang, 2016). It focuses on information on the entire income distribution (Cobham et al., 2015). Therefore, the Palma ratio is employed to complement the Gini coefficient because it addresses its limitation by explicitly focusing on the income share of the top 10% relative to the bottom 40%, thereby highlighting disparities between the richest and poorest segments of society (Cobham & Sumner, 2013). In addition, it is suggested as a standard indicator of income inequality by the OECD and the UNDP. The ratio captures the distribution's tails between the poorest and the richest. That is, it primarily focuses on the distribution of income between the highest and the lowest levels. It specifies inequality in income within a group of measures known as the inter-deciles. A higher value of the ratio indicates higher inequality measured in terms of gross or disposable income (Odhiambo, 2020; OECD, 2024b; World Inequality Database, 2023b). Including the Palma ratio adds value to the analysis in two ways. First, it allows the study to verify whether the estimated relationship between financial inclusion and income inequality remains robust when inequality is measured in a way that emphasises disparities between the richest and poorest groups in society. Second, because financial inclusion policies are often designed to improve financial access for lower-income populations, the Palma ratio is particularly crucial in assessing whether such changes affect the relative income position of the bottom 40% compared to the top 10%. This variable is used as a robustness check for the Gini coefficient.

5.2.2.2 Independent Variables – Financial Inclusion

To capture the multifaceted nature of financial inclusion, the study uses access, penetration and usage dimensions, along with an overall index to measure it. The study, however, excluded other dimensions of financial inclusion, such as cost and quality, due to the lack of data.

Access Dimension

To measure the access dimension, this study uses four proxies, namely, ATMs per 100,000 adults, AMTs per 1,000 km^2, remittances, and commercial banks per 100,000 adults. The first two proxies are on ATMs. It is measured by ATMs per 100,000 adults and AMTs per 1,000 km^2 (see Kebede et al., 2023; Omar & Inaba, 2020; Park & Mercado, 2015). ATMs foster financial inclusion by providing various services such as cash withdrawals, accepting deposits, processing money transfers, and on-screen connections to remote tellers. Through ATMs, financial institutions can

extend the traditional functions of the bank branches into remote areas (NCR, 2017). According to Demirgüç-Kunt and Klapper (2012), access to ATMs indicates that people can easily access formal financial services and products and that ATMs are an appropriate measure of financial inclusion.

The third proxy that measures access is remittances. It is measured by personal remittances received (percentage of GDP) following the study by Naceur, Chami, and Trabelsi (2020). According to the International Fund for Agricultural Development (IFAD) and the World Bank Group (2015), remittances may function as a shock absorber that increases in times of crises (such as the COVID-19 pandemic) and falls in good times. In another study, Ratha (2007) stated that when households receive remittances, it improves their income and access to financial services, such as savings. This is because the recipients may want to save or invest the money they receive, which creates demand for a bank account that provides a safe place to keep the excess cash until it is needed. In addition, receiving remittances from a formal financial institution may enlighten the recipient about the available financial products (Abokyi, 2023; IFAD & World Bank Group, 2015; Toxopeus & Lensink, 2008).

The fourth proxy, which measures access, is commercial banks. It is measured by commercial banks per 100,000 adults following the studies by Agyemang-Badu et al. (2018), Emara and Mohieldin (2020) and Wong et al. (2023). Commercial banks are the traditional channel through which the unbanked are included in the financial system. Banks can improve financial inclusion by expanding branches, improving access to loans, and offering low bank account charges, among others (Nkuna, Lapukeni, Kaude, & Kabango, 2018; Raihanath & Pavithran, 2014).

Penetration Dimension

This study uses two proxies to measure the penetration dimension, namely, the number of deposit accounts with commercial banks per 1,000 adults and the number of commercial bank branches per 1,000 km^2 (see Sarma, 2016; Seifelyazal et al., 2023; Verma & Giri, 2022). A financial system should include as many consumers as possible, with services and products penetrating different groups of consumers in society (Nguyen, 2021; Sarma, 2008). Higher penetration of branches reflects easier access to financial services (Kumar, 2013; Maity & Sahu, 2023).

Usage Dimension

To measure the usage dimension, this study uses two proxies, namely, domestic credit to the private sector as a percentage of gross domestic product (GDP), and gross domestic savings as a percentage of GDP. Credit – as measured by domestic credit to the private sector as a percentage of GDP – is used as a proxy for financial inclusion usage following studies by Ashenafi and Yan (2023), Kebede et al. (2023) and Park and Mercado (2018). According to the OECD (2020a), access to credit for households and businesses is crucial to addressing financial risks arising from financial shocks and obtaining funds for new business ventures. Access to credit allows firms and households to take advantage of investment opportunities in health, education and training (World Bank Group, 2025a). In addition, credit enhances the firm's ability to be innovative and diversify into new areas (Beck, Demirgüç¸-Kunt & Honohan, 2009).

The second usage proxy is gross domestic savings as a percentage of GDP. Following Chakraborty and Abraham (2021), financial inclusion is measured by gross domestic savings as a percentage of GDP. Households forfeit current expenditures to increase future consumption, thereby maximising inter-temporal utility (Zhang & Posso, 2019). Savings allow households to invest in education and new business ventures and protect individuals against risk and uncertainty (Demirgüç-Kunt & Klapper, 2012; Demirgüç-Kunt & Klapper, 2013). Additionally, savings products are crucial because they enable individuals to stretch their income throughout difficult economic times and acquire wealth to purchase goods and services in the future (National Treasury, 2020). According to Dogan, Madaleno and Taskin (2021), savings are the most important channel through which financial inclusion could help households escape poverty.

5.2.2.3 Independent Variables – Control Variables

Furthermore, the study uses a variety of control variables that could affect income inequality. The study will use the following control variables:

First, economic growth (GDPpcap) is an important macroeconomic variable that measures the productivity of a country, which will be measured by real GDP per capita (constant 2015 US$). In theory, income inequality increases at the early stages of economic development but falls as the economy develops further. The relationship is explained to have an inverted-U-shape (Kuznets, 1955). This occurs when income distribution is skewed towards rich people, while the poor are at

the lower end of the income distribution (Chu-Khanh & Chu, 2018). An increase in per capita real GDP can lower income inequality by increasing the share of income of poor people. On the other hand, income inequality can increase if the benefits of growth bypass the poor (Beck, Demirgüç-Kunt & Levine, 2007; Demir et al., 2022). Based on the above background, the study expects a negative relationship between per capita growth and income inequality.

Second, the study includes trade openness (trade), which will be measured by trade openness as a percentage of GDP following Mushtaq and Bruneau (2019). Theoretically and empirically, trade is considered to affect income inequality. The Heckscher-Ohlin trade model shows that when a country opens to trade, it will experience an increase in the relative wages of low-skilled labour, thus lowering income inequality. On the contrary, if trade openness results in the transfer of skill-biased technology, particularly to developing nations, it could exacerbate income inequality by increasing the demand for skilled labour (Lee & Lee, 2018). According to Chu-Khanh and Chu (2018), trade increases income inequality in developed countries because capital owners get a bigger share of income, while in developing countries, trade reduces income inequality because unskilled labour benefits from it. Jaumotte, Lall and Papageorgiou (2013) and Turégano and García-Herrero (2018) found that increased participation in trade reduces income inequality significantly, and this effect takes place through economic growth (Chakrabarti, 2000). On the contrary, Dollar and Kray (2002) suggest that trade does not affect inequality. The study expects a negative relationship between trade and income inequality.

Third, redistribution policies are included to capture the effect of fiscal policy as a tool to achieve fair income distribution (Congressional Budget Office (CBO), 2011; Dabla-Norris et al., 2015; IMF, 2014). Redistribution policies are measured by the general government expenditure as a percentage of GDP (government), following Lim and McNelis (2014) and Md Jamil et al. (2024). According to Lim and McNelis (2014), government spending on policy interventions such as education effectively reduces income inequality in developing countries. At the same time, higher government spending in the presence of lobbying could increase income inequality. Li et al. (2000) confirm that in the presence of corruption, government spending causes an inverted-U-shape and a Gini differential across developing and industrial countries. Based on the above background, the study expects a negative relationship between redistribution policies and income inequality.

Fourth, following Kebede et al. (2023), property rights are included to capture the effect of institutional factors and are measured by the protection of property rights (propertyrights). The existing literature suggests that countries characterised by strong corruption control, efficient government, and political stability create an environment conducive to economic growth, equitable income distribution, and poverty reduction. In particular, institutional factors such as the rule of law, accountability, minimal expropriation risk, and a sound regulatory system are associated with lower levels of income inequality and poverty (Tebaldi & Mohan, 2010). Conversely, in countries with weak institutions (such as poor anti-corruption controls and weak contract enforcement), households and businesses with better collateral and political connections reap greater benefits from available financial services, such as credit, thereby increasing income inequality (Kebede et al., 2023). Therefore, strengthening the regulatory environment is crucial for building a secure and inclusive financial system (Kaufmann et al., 2010; Muriu, 2020; Nsiah & Tweneboah, 2023; World Bank, 2010). This control variable is added as a robustness check for the baseline regression results. The study expects property rights to have a negative impact on income inequality.

Fifth, following a study by Abdulkarim and Ali (2019) and Jaumotte, Lall and Papageorgiou (2013), the inflation rate (inflation) is measured by the Consumer Price Index (CPI), which is a continuous increase in the general prices of goods and services. The CPI shows changes in the average costs of a basket of consumer goods. Its impact on income inequality depends on the protection of people's income against inflation and the costs associated with the protection (Chu-Khanh & Chu, 2018). Studies by Dabla-Norris et al. (2015) and Jaumotte et al. (2013) found that inflation increases income inequality. This is because inflation tends to exacerbate income inequality by reducing real income and redistributing earnings from workers to the profit takers (Lee & Lee, 2018). The study expects inflation to positively affect income inequality.

Sixth, according to existing literature, an increase in population exacerbates the social problems of accessible education, health system, unemployment, and crime, and reduces the percentage of distribution to the poor (Ahlburg, 1996; Demir et al., 2022; Jaumotte et al., 2013; Neaime & Gaysset, 2018). The population (in millions) is to measure population growth (population) following Neaime and Gaysset (2018). We expect a positive relationship between population

growth and income inequality. Table 5.1 presents the set of control variables, proxies, justifications, expected signs, and sources of the variables employed in the study.

Table 5. 1: Control variables, proxies, justification, expected signs, and the sources of the variables

Variable	Proxy	Justification	Expected sign	Source(s)
Dependent variables				
Gini index (lginico)	Gini coefficient index (disposable)	Azim (2022); Le et al. (2019); Park and Mercado (2015)		World Inequality Database (2025)
Palma ratio (lpalma)	Palma ratio (robustness check)	Agyemang-Badu et al. (2018); Menyelim et al. (2021)		UNU-WIDER, World Income Inequality Database (WIID) (2024)
Primary independent variables				
Access dimension indicator (fi_access)	ATMs per 100,000 adults	Demirgüç-Kunt and Klapper (2012); Sarma (2016); Park and Mercado (2015); Omar and Inaba (2020); Sawadogo and Semedo (2021)	-	World Bank Group (2022b); Financial Access Survey by the International Monetary Fund (2024)
	ATMs per 1,000 km^2	Kebede et al. (2023); Seifelyazal et al. (2023)		Financial Access Survey by the International Monetary Fund (2024)
	Commercial bank branches	Agyemang-Badu et al. (2018); Emara and Mohieldin (2020); Raihanath and Pavithran (2014); Wong et al. (2023)		World Development Indicators (WDI) (2024)
	Personal remittances received (percentage of GDP)	Koomson, Villano and Hadley (2020); Naceur et al. (2020)		World Development Indicators (2024)
Penetration dimension indicator (fi_penetration)	Number of deposit accounts with commercial banks per 1,000 adults	Omar and Inaba (2020); Sarma (2016); Verma and Giri (2022)	-	Financial Access Survey by the International Monetary Fund (2024)
	Number of commercial bank branches per 1,000 km^2	Sarma (2016); Verma and Giri (2022)		Financial Access Survey by the International Monetary Fund (2024)
Usage dimension indicator (fi_usage)	Domestic credit to the private sector as a	Ashenafi and Yan (2023); Kebede et al.	-	World Development Indicators (2024)

	percentage of gross domestic product (GDP)	(2023); Park and Mercado (2018)		
	Gross domestic savings as a percentage of GDP	Chakraborty and Abraham (2021)		World Development Indicators (2025)
Financial inclusion index (fi_i)	Computed from all the dimensions of financial inclusion		-	
Control variables				
Real economic growth (lGDPpcap)	Real GDP per capita	Kuznets (1955); Demir et al. (2022); Beck et al. (2007)	-	WDI (2024)
Trade openness (ltrade)	Trade as a percentage of GDP	Mushtaq and Bruneau (2019); Demir et al. (2022)	-	WDI (2024)
Redistribution policies (lgovernment)	General government expenditure as a percentage of GDP	Lim and McNelis (2014); Md Jamil et al. (2024)	-	WDI (2024)
Property rights (lpropertyrights)	Protection of property rights	Kebede et al. (2023)	-	Fraser Institute Economic Freedom Dataset (2025)
Inflation rate (linflation)	Consumer price index	Abdulkarim and Ali (2019); Jaumotte et al. (2013)	+	WDI (2024)
Population growth (lpopulation)	Population in millions	Neaime and Gaysset (2018)	+	WDI (2025)

Source: Compiled by the author

5.3 The General Empirical Model Specification

The current study investigates the impact of financial inclusion on income inequality across 25 African countries. It seeks to understand how financial inclusion, particularly through access, penetration and usage dimensions, affects income inequality in the region. To do this, the study presents the general empirical model that guides the estimation of this relationship. This study adopts the theoretical framework by Clarke et al. (2006) to investigate how financial inclusion affects income inequality across 25 African countries.

The theoretical framework of this study is based on a combination of complementary theories. Building on the foundational work of Kuznets (1955), Greenwood and Jovanovic (1990) extend Kuznets' framework by incorporating the financial sector. Their model suggests that at the early stages of economic development, the financial system is underdeveloped and characterised by fixed participation costs. These barriers prevent low-income individuals from accessing financial services, while wealthier individuals can participate and benefit. As a result, income inequality

increases. However, as the financial sector develops and matures along with the fixed membership costs, access to financial services becomes more widespread. At this stage, low-income individuals can access financial services, thereby reducing income inequality (Claessens & Perotti, 2007; Clark et al., 2003). In addition, in the presence of information asymmetries and imperfect credit markets, access to financial services, particularly credit, is often skewed toward wealthier individuals who can meet the collateral and creditworthiness requirements. This unequal access enables richer individuals to invest in high-return opportunities and accumulate wealth faster than poorer individuals, thereby exacerbating inequality (Aghion & Bolton, 1997; Banerjee & Newman, 1993; Galor & Zeira, 1993). However, in the presence of minimal financial market imperfections, everyone, particularly low-income individuals, has access to finance, enabling investment in education and new business ventures, thereby building income-generating capacity and reducing inequality (Aghion & Bolton, 1997; Klapper et al., 2006). Consequently, financial inclusion has a reducing effect on income inequality. Following previous studies by Demir et al. (2022) and Rehman et al. (2008), the model is specified as follows:

$$lginico_{i,t} = a_0 + \beta_1 FI_{it} + \beta X_{it} + \epsilon_{it} \quad (5.1)$$

$$lpalma_{i,t} = a_0 + \beta_1 FI_{it} + \beta X_{it} + \epsilon_{it} \quad (5.2)$$

The panel of countries and the study's time dimension are represented by i=1,…, N and t=1,…, T, respectively. Ginico is the Gini coefficient in equation 5.1, and Palma (for robustness check) is the Palma ratio in equation 5.2, representing the dependent variables. In equations 5.1 and 5.2, FI is a measure of financial inclusion, and it is proxied by the sub-indices of access, penetration and usage and an overall composite indicator, respectively. X is a vector of control variables, such as real GDP per capita, trade openness, government expenditure, inflation rate, population, and property rights (for robustness check) and ϵ_{it} is the error term.

5.4 Construction of the Financial Inclusion Index

5.4.1 Construction of the Financial Inclusion Sub-Indices and the Overall Index

In the literature, two approaches have been used to construct a financial inclusion index. First, the parametric approach, which avoids problems associated with assigning weights and determines and assigns weights endogenously through covariations between the dimensions (Cámara &

Tuesta, 2014; El Bourainy et al., 2021; Park & Mercado, 2018). Second, the non-parametric approach assigns the weights for the dimensions of financial inclusion exogenously based on the researchers' assumptions (Chakravarty & Pal, 2013; Sarma, 2008). This study will use the parametric approach to construct the indices. The reason is that indices are responsive to the allocation of weights, since any change in the weights of the dimensions has a significant influence on the results (Seifelyazal et al., 2023).

Under the parametric approach, PCA and Factor Analysis (FA) techniques are generally used for index construction. This study uses the PCA method to construct the indices. The PCA is often a preferred method of constructing an index over FA because it does not require prior assumptions about the raw data, such as determining the underlying number of common factors (Steiger, 1979). This method is applicable because it reduces a fairly large number of variables into a smaller set of uncorrelated factors by using ideal weight to avoid the researcher's bias (Seifelyazal et al., 2023).

To construct the sub-indices and the overall index of financial inclusion, this study classified the financial inclusion indicators into three dimensions: access, penetration and usage. The construction of each dimension involved the creation of a sub-index that included various components of that dimension. The construction of sub-indices rather than studying individual variables has various benefits. First, the constructed sub-index captures the overall dimension, which can be more useful for policy decisions than individual variables. Second, due to the fact that a sub-index includes variables that are highly correlated, it is best to calculate the individual indices separately and then calculate the overall index using the sum of the three sub-indices (Seifelyazal et al., 2023).

The financial inclusion sub-indices and overall index will be constructed using a two-stage PCA following Cámara and Tuesta (2014), El Bourainy et al. (2021), and Park and Mercado (2018). The PCA is a statistical technique that converts a set of possibly correlated variables into a set of linear, uncorrelated variables through an orthogonal transformation. Rather than depending on one indicator, the study will construct indices and an overall index using various proxies of access, penetration and usage dimensions, namely: ATMs (per 100,000 adults), ATMs per 1,000 km^2,

commercial banks (per 100,000 adults), remittances, the number of deposit accounts with commercial banks per 1,000 adults, the number of commercial bank branches per 1,000 km^2, credit and gross domestic savings are employed. The index of financial inclusion will be constructed by estimating the equations below, following Park and Mercardo (2018).

Step 1: Normalisation of the indicators of financial inclusion:

$$D_{c,i,t,} = \frac{d_{c,i,t} - m_t}{M_t - m_t} \tag{5.3}$$

where $D_{c,i,t}$ presents the normalised value of the indicator c for country i in period t; $d_{c,i,t}$ is the actual value of indicator c for country i in period t; m_t is the minimum value t, M_t is the maximum value. The normalised value shows the country's level of financial inclusion in relation to the minimum (0) and maximum (1) values across years and countries.

Step 2: The first stage

In constructing the financial inclusion index, the first stage involves estimating the three sub-indices of access, penetration and usage employing the following equations for each indicator:

$$DIM_{it}^{A} = x_1 Ac_{1,it} + x_2 Ac_{2,it} + x_3 Ac_{3,it} + x_4 Ac_{4,it} \tag{5.4}$$

$$DIM_{it}^{Pn} = \gamma_1 Pn_{1,it} + \gamma_2 Pn_{2,it} \tag{5.5}$$

$$DIM_{it}^{U} = \gamma_1 Us_{1,it} + \gamma_2 Us_{2,it} \tag{5.6}$$

where x and γ present the coefficients to be estimated.

Step 3: The second stage

The constructed financial inclusion index is expressed as follows:

$$FI_I_{it} = \alpha_1 DIM_{1,it}^{Ac} + \alpha_2 DIM_{2,it}^{Pn} + \alpha_3 DIM_{3,it}^{Us} \tag{5.7}$$

where FI_I measures the financial inclusion index for each country; DIM_{it}^{Ac}, DIM_{it}^{Pn} and DIM_{it}^{Us} presents access, penetration and usage dimensions of financial inclusion, respectively, and subscription *i* denotes the country in year t.

5.5 Preliminary Tests

After we construct various indices of financial inclusion, we conduct preliminary tests. The literature has introduced many tools for testing data in a study. To evaluate the impact of financial inclusion on income inequality, the study employed various data summary measures, including descriptive statistics and pairwise correlation analysis. It also conducted diagnostic tests to identify appropriate testing techniques to investigate the impact. These tests include unit root tests, cross-sectional dependency tests, tests for time-fixed effects, heteroskedasticity, multicollinearity, and serial correlation.

5.5.1 Descriptive Statistics

Prior to performing the regression estimation, the study provides a summary of the statistics to show the general properties of the data. The descriptive statistics are numerical properties or graphical techniques used to organise and describe the characteristics or factors of a dataset (Fisher & Marshall, 2009). The mean, standard deviation, minimum and maximum values for each variable used in this study are calculated.

5.5.2 Pairwise Correlation Analysis

Following the descriptive statistics, the study estimates the correlation matrix that provides the correlation between all pairs of the sample. The correlation coefficients are used to analyse the relationship between two or more variables. This helps to investigate the structure and the direction of the association between the dependent and independent variables. The value of the coefficient can vary between 0 (showing no correlation) and 1 (showing perfect correlation) (Cohen, Manion & Morrison, 2000).

5.5.3 Panel Unit Root Tests

After the descriptive statistics and the correlation matrix of the variables are determined, the study proceeds to test the stationarity of the variables. The unit root test is important for observing the

stationarity of the properties before an empirical investigation, as distinguishing between stationary and non-stationary time series is crucial in economic applications (Verma & Giri, 2022). The order of integration, the number of times a non-stationary series is differenced to achieve stationarity, is crucial in econometrics (Christopoulos & Tsionas, 2004; Verma & Giri, 2022). Various traditional unit root tests were proposed, such as the widely used Dickey-Fuller test and the Augmented Dickey-Fuller test statistics (Dickey & Fuller, 1979; Dickey & Fuller, 1981; Levin et al., 2002), followed by semi-parametric alternatives by Phillips (1987) and Phillips & Perron (1988), which improved from the former methods in terms of power and size (Levin et al., 2002). However, all these methods suffer from limited power against H_1 in the presence of infinite samples, especially when divergences from equilibrium are highly persistent (Levin et al., 2002).

To address this shortcoming, this study employs panel-based unit root tests, particularly the first-generation tests, which enhance power by accounting for cross-sectional information. The first-generation unit root tests assume cross-sectional independence and include frameworks by Levin and Lin (1992), Levin et al. (2002), Im et al. (2003), Maddala and Wu (1999), Choi (2001), and Hadri (2000), as cited by Hurlin and Mignon (2007). This study uses two unit root tests that are based on cross-sectional independence that can be applied to cross-sectional panel time series data. These are the Levin, Lin & Chu (2002), and the Im, Pesaran and Shin (2003), following Verma and Giri (2022).

The Levin-Lin-Chu (LLC) test by Levin et al. (2002) is based on the traditional Augmented Dickey-Fuller (ADF) test and extends from its framework by allowing for heterogeneity in the intercepts within the panel, meaning each unit can have a different starting point or baseline. However, it assumes a homogenous first-order autoregressive parameter, implying that all the cross-section units tend to return to the equilibrium at the same time after a shock (Gengenbach, Palm & Urbain, 2006). The assumption of homogeneity is important because it improves the statistical power of the test. By pooling data from the panels, it is highly likely that the test will detect stationarity if it exists. As explained by Levin et al. (2002), the basic idea is to exploit the cross-sectional dimension information to improve the power of the test. Rejecting the null hypothesis under homogeneity implies that all the panel units are stationary and follow a common dynamic process. Furthermore, Levin et al.'s test is suitable for balanced panel data with panels of

moderate size. In such cases, the standard multivariate time series methods may become insufficient and infeasible, making the LLC technique an effective alternative (Levin et al., 2002). The formula is expressed in equation 5.8, following the studies by Hurlin and Mignon (2007).

$$\Delta y_{i,t} = \alpha_i + \rho y_{it-1} + \sum_{z=1}^{p_i} \beta_{i,z} \Delta y_{i,t-z} + \varepsilon_{i,t} \quad (5.8)$$

The LLC tests the null hypothesis that each individual time series has a unit root against the alternative that each time series is stationary (Levin et al., 2002).

Secondly, the study employs the Im-Pesaran-Shin (IPS) by Im et al. (2003) test, which modifies the LLC test by allowing heterogeneity in the autoregressive coefficients across the panel countries. Unlike the LLC test, which assumes that cross-section units tend to return to the equilibrium at the same time, the IPS test relaxes the assumption and allows each cross-section unit to have different autoregressive parameters. In addition, the IPS is applicable to both balanced and unbalanced panel data, with N cross-sectional units and Ti time series observations for each i=1,…, N. It is based on the average of individual ADF statistics (known as the t-bar statistics) to test the null hypothesis that all the panels are non-stationary against the alternative that some panels are stationary (Gengenbach et al., 2006; Verma & Giri, 2022). The formula is expressed in equation 5.9, following studies by Hurlin and Mignon (2007).

$$\Delta y_{i,t} = \alpha_i + \rho_i y_{it-1} = \sum_{z=1}^{p_i} \beta_{i,z} \Delta y_{i,t-z} + \varepsilon_{i,t} \quad (5.9)$$

The likelihood-based approach permits residual serial correlation and heterogeneity of the dynamics and error variances across the panels. The Monte Carlo simulations performed by Im et al. (2003) show that the t-bar is effective even on panels with small time series (for example, T=10), especially when the appropriate lag order is chosen to control for serial correlation (Im et al., 2003). The IPS test has some notable advantages. First, the key strength of this test lies in its realistic assumption of heterogeneity under the alternative hypothesis, acknowledging that some units may be stationary while some are not, a case that is often experienced in econometric analysis. By relaxing the restrictive assumption of a common adjustment speed, the IPS test is suitable for diverse panel data. Furthermore, it improves power by identifying stationarity even if

it exists in some units of the panel. Ultimately, the IPS test provides an informative model for panel unit root testing, offering the capability to conclude that a portion of the cross-units are stationary rather than an all-or-nothing outcome (Im et al., 2003). In the case of a panel dataset that exhibits different dynamic characteristics, the assumption of homogeneity becomes restrictive, and the unit root tests must consider this heterogeneity (Moon & Perron, 2004; Hurlin & Mignon, 2007).

5.5.4 Cross-Sectional Dependence Tests

The existing body of panel-data literature concurs that panel data is likely to exhibit cross-sectional dependencies in the errors, which may arise from common shocks (e.g., economic and financial interconnections) and unobserved common factors (e.g., social norms) between countries. If not accounted for, these dependencies could result in biased estimation results (De Hoyos & Sarafidis, 2006). The study uses post-estimation cross-sectional dependency tests, including the cross-sectional dependency CD test by Pesaran (2004), and the one by Friedman (1937). These tests can be used when T is less than N and for both balanced and unbalanced panels (De Hoyos & Sarafidis, 2006).

The Pesaran test, as the primary test in the study, is widely used in empirical literature because of its robustness. "*The test is based on a simple average of all pair-wise correlation coefficients of the Ordinary Least Squares (OLS) residuals from the individual regressions in the panel"* (Pesaran, 2004, Pesaran, 2021: 1). The method assesses cross-sectional dependence by computing the average of the pairwise correlation coefficients of OLS residuals from individual regressions within the panels. It accommodates cross-sectional dependency tests for a fixed order p and cases with no predefined ordering of cross-sectional units, known as CD(p) and CD tests (Pesaran, 2004; Pesaran, 2021). It has various advantages; first, the test is valid whether the data has homogenous or heterogeneous slopes (De Hoyos & Sarafidis, 2006). Second, this test is suitable for several panel-based data models, including stationery and unit root dynamic panels with large N and small T (Pesaran, 2004). Third, the test performs well, maintaining correct size and satisfactory power even in very small sample sizes and remains robust in the presence of structural breaks and unit roots (Pesaran, 2004; Pesaran, 2021). The formula is expressed in equation 5.10, following studies by De Hoyos and Sarafidis (2006) and Pesaran (2004; 2021):

$$CD = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{1=1}^{n-1} \sum_{j=i+1}^{n} \hat{\rho}_{xy}\right) \quad (5.10)$$

where n and t denote the cross-sections and time, respectively; $\hat{\rho}_{xy}$ is the pairwise cross-sectional correlation coefficient of residuals from the conventional Augmented Dickey-Fuller (ADF) regression. That is the correlation coefficient between country x and country y.

H_0: there is cross-sectional independence (p-value is greater than 0.05)

H_1: there is cross-sectional dependence (p-value is less than 0.05)

The results of the primary test, the Pesaran test, will be compared to the Friedman (1937) statistic test. The Friedman test is a non-parametric test based on the average Spearman's rank correlation coefficient, and it considers homogenous slopes (Friedman, 1937). It does not require the assumption of residuals that are normally distributed. In addition, similar to the Pesaran CD test, this test involves the sum of the pairwise correlation coefficients of the residual matrix (De Hoyos & Sarafidis, 2006).

5.6 Estimation Techniques

5.6.1 Linear Estimation of the Association Between Financial Inclusion and Income Inequality

To investigate the impact of financial inclusion on income inequality, the study employs two approaches: the system Generalised Method of Moments (GMM) developed by Arellano and Bover (1995) and reviewed by Blundell and Bond (1998), and the quantile regression developed by Koenker and Bassett (1978).

5.6.1.1 System Generalised Method of Moments (GMM) Analysis of the Relationship Between Financial Inclusion and Income Inequality

The system GMM is a dynamic panel model that includes the lagged value of the dependent variable as an explanatory variable in the model because the current level of income may be strongly influenced by the level of income from the previous period (Segning et al., 2023). The use of a two-step method is recommended by Blundell and Bond (1998) in the case of heteroscedasticity (Seifelyazal et al., 2023). The system GMM combines first-difference equations

with a level equation, using lagged internal instruments in difference equations (Segning et al., 2023). The study chose the system GMM (two-step) for various reasons. First, the study mainly uses this method because the number of countries (N) is greater than the number of periods (T) (N>T) (Menyelim et al., 2021; Roodman, 2009). Second, this method is widely used to examine the relationship between financial inclusion and income inequality in the field of study (see, for example, Khan et al., 2022; Ouechtati, 2020). Third, it provides consistent and efficient estimates and is a good fit for panels with fewer periods (Neaime & Gaysset, 2018). Fourth, its use is crucial when there is a prevalent unobserved cross-sectional variability (Menyelim et al., 2021). This is of particular importance for this study, as it examines the financial inclusion-inequality relationship across a panel of countries that may have varying institutions and levels of development. Fifth, the study employed this technique because it effectively accounts for heteroskedasticity and autocorrelation issues in the model (Arellano & Bover, 1995; Blundell & Bond, 1998; Menyelim et al., 2021). Sixth, it addresses endogeneity and unobserved country-specific effects (Khan et al., 2022; Neaime & Gaysset, 2018). One significant source of endogeneity could emanate from the reverse causality between income inequality and financial access. The macroeconomic policies that are pursued to reduce income inequality mostly include strategies to increase income. Therefore, an increase in income may also increase the demand for formal financial products (Khan et al., 2022). Another source of endogeneity can arise from the association between income inequality and economic growth. An increase in per capita real GDP can lower income inequality by increasing the share of income of poor people. On the other hand, income inequality can increase if the benefits of growth bypass the poor (Demir et al., 2022; Beck, Demirgüç-Kunt & Levine, 2007). Furthermore, endogeneity is likely to arise from unobserved factors affecting both income inequality and financial inclusion, omitted variables and measurement error (Demir et al., 2022; Kebede et al., 2023; Murtazashvili & Wooldridge, 2008). The two-step system GMM model is specified following Ali et al. (2021) and Seifelyazal et al. (2023):

$$lginico_{it} = \rho_0 + \rho_1 lginico_{it-1} + \rho_2 fi_{it} + \rho X_{it} + \partial_i + \mu_{it} \quad (5.11)$$

$$lpalma_{it} = \rho_0 + \rho_1 lpalma_{it-1} + \rho_2 fi_{it} + \rho X_{it} + \partial_i + \mu_{it} \quad (5.12)$$

Where $lginico_{it}$, is the log of the dependent variable of country *i* in year *t*, which is a measure of income inequality; $lginico_{it-1}$ is the lagged measure of the dependent variable used as an exploratory variable; fi_{it} presents the access, penetration, usage and the overall index of financial inclusion; ρX_{it} represents a vector of the control variables, including real GDP per capita, trade openness, government expenditure, inflation rate, and population; ∂_i presents unobserved country-specific effects; and μ_{it} represents the error term being independently and identically distributed across the panels with constant variance. The Hansen test is used to show the validity of the additional instruments included. In addition, the consistency of the estimates will be shown by the *p*-values from the Arellano-Bond AR(1), which confirms first-order serial correlation and AR (2), which requires that the error terms are not serially correlated at second order. To analyse the robustness of the Gini coefficient results, an alternative measure of income inequality, the Palma ratio (*lpalma*), and a control variable representing institutional factors, such as property rights protection, are employed.

5.6.1.2 Quantile Regression Analysis of the Relationship Between Financial Inclusion and Income Inequality

In another model, this study investigates the differential impact using the quantile regression developed by Koenker and Bassett (1978). This study adopted quantile regression, following the existing literature on the differential impact of finance on inequality, including Altunbaş and Thornton (2019) and Demir et al. (2022). In addition, this method accommodates heteroskedasticity within the conditional quantile formulation (Koenker, 2005). Quantile regression estimates the relationship between the predictor(s) and outcomes across varying points of the outcome's distribution (Petscher & Logan, 2014). Using quantile regression, the study will investigate the potential differential impact of financial inclusion on income inequality throughout the conditional distribution across countries with varying levels of income inequality (Altunbaş & Thornton, 2019; Demir et al., 2022; Park & Mercado, 2015; Sukmana & Ibrahim, 2018). The study will use three varying ranges of income inequalities, namely medium (40-50), moderately high (51-60) and high (61-80)[13] income inequality, informed by the study of Batuo et al. (2021). The

[13] See Table 5.2 with the list of countries according to income inequality range in the Appendices on page 256. There is no country with low-income inequality since all countries have a Gini coefficient that starts from 0.41.

countries are grouped according to these categories of inequality. The specification for the quantile regression will be as follows, informed by Altunbaş and Thornton (2019) and Demir et al. (2022):

$$min \quad \sum_{i\in\{i:y_t\geq x_i'\alpha\}} \alpha|y_i - x_i'\,\Omega\Big| + \sum_{i\in\{i:y_t<x_i'\alpha\}} 1-\alpha|y_i - x_i'\,\Omega\Big| \tag{5.13}$$

where y_i presents the dependent variable, and $x_i$is k by 1 vector of independent variables. For the α-th quantile ($0 < \alpha < 1$).

The quantile regression technique estimates the differential relationship between a set of independent variables and a specific quantile of a dependent variable. Through quantile regression, differential relationships for the different quantiles of the conditional distribution of the dependent variable can be estimated. This regression is based on minimising the sum of the absolute errors. In addition, quantile regression has an advantage because the method is semi-parametric in nature, meaning it does not assume a specific distribution of the errors. This characteristic makes it less sensitive to outliers and non-normal errors. Furthermore, it is also invariant to monotonic transformation, such as logarithmic transformations, for a feature that is not possible for linear regression (Petscher & Logan, 2014). Hence, this regression estimator is suitable for this study (Allen, Singh, Powell & Kramadibrata, 2012; Sukmana & Ibrahim, 2018). Lastly, it captures heterogeneity across the varying points of income distribution (Koenker & Bassett, 1978).

This study employs quantile regression to examine whether financial inclusion affects income inequality (measured by the Gini coefficient) differently when levels of income inequality vary across the 25 African nations. As a result, through the quantile regression, the study can evaluate how financial inclusion affects income inequality throughout the conditional distribution while adjusting for hidden country-level variability (unobserved panel heterogeneity). This is significant for this study, as it examines the financial inclusion-inequality relationship across a panel of countries that may have varying institutions and levels of development. The relevance of the predictors in a quantile regression model may differ depending on the quantile of the dependent variable (Koenker & Bassett, 1978). In the context of this study, this implies that the effects of financial inclusion (as well as other independent variables) on income inequality may differ across

the various quantiles of income inequality in the countries we study. In simpler terms, depending on whether a country experiences low, medium, moderately high or extremely high levels of income inequality, the impact of financial inclusion will differ.

5.6.2 Non-Linear Analysis of the Relationship Between Financial Inclusion and Income Inequality

This study, inspired by the research of Greenwood and Jovanovic (1990) and Aghion and Bolton (1997), explores the non-linear relationship between financial inclusion and income inequality in 25 African countries. Greenwood and Jovanovic (1990) argue that there is an inverted-U-shaped relationship between the development of the financial system and income inequality, which depends on the stage of economic development. In the early stages of development, income inequality tends to increase. As development progresses, this inequality decreases before stabilising in the long term. Similarly, Aghion and Bolton (1997) argue that the accumulation of capital enhances access to financial services, which subsequently helps to reduce the income gap. This relationship between capital accumulation and the distribution of income and wealth bears similarities to the dynamics described by the Kuznets curve. Studying the non-linear relationship between financial inclusion and income inequality is significant for this study because literature suggests that the movement of income inequality is non-monotonic on the development path, it can increase, then decrease and increase again as it moves towards the steady state, as noted by Townsend and Ueda (2006).

Given the above background, this study employs the squared term of financial inclusion to analyse the non-linear relationship, which is widely used in the literature for simplicity and consideration of distributional effects.

5.6.2.1 Inverted-U-shape Hypothesis Association Between Financial Inclusion and Income Inequality Using a Squared Term

This study employs the two-step system GMM technique to examine the potential existence of a non-linear inverted-U-shape relationship between the overall financial inclusion index and income inequality in 25 African countries. The model includes the square term of the financial inclusion index, $fi_isquare_{it}$, following literature on the finance-inequality nexus, including Clarke et al.

(2003) and Hassan and Meyer (2020). To get the equation below, the study followed Segning et al. (2023):

$$lginico_{it} = \rho_0 + \rho_1 lginico_{it-1} + \rho_2 fi_i_{it} + \rho_3 fi_i_{square_{it}} + \rho X_{it} + \partial_i + \mu_{it} \quad (5.14)$$

$$lpalma_{it} = \rho_0 + \rho_1 lpalma_{it-1} + \rho_2 fi_i_{it} + \rho_3 fi_i_{square_{it}} + \rho X_{it} + \partial_i + \mu_{it} \quad (5.15)$$

where fi_i_{it} is the financial inclusion index of country *i* in year *t*; $fi_i_{square_{it}}$ is the square term of the financial inclusion index. The study will use a square of the financial inclusion index to examine whether the relationship between financial inclusion and income inequality exhibits an inverted-U hypothesis or not, which states that there is a non-linear relation between financial inclusion and income inequality. This study used system GMM because it effectively accounts for heteroskedasticity and autocorrelation issues in the model (Arellano & Bover, 1995; Blundell & Bond, 1998; Menyelim et al., 2021). It also addresses endogeneity and unobserved country-specific effects (Khan et al., 2022; Neaime & Gaysset, 2018). In addition, the square term is used because the theory of Greenwood and Jovanovic (1990) suggests that the impact of financial inclusion on income inequality follows a gradual, non-linear (inverted-U-shaped) relationship, rather than a sudden change at a specific point. It changes over time progressively. The theory shows a continuous transition along the development path. Therefore, equations 5.14 and 5.15 hypothesise that the impact of financial inclusion on income inequality is not always negative or positive, such that financial inclusion at early stages of development (later stages of development) of the financial system could widen (reduce) income inequality. If the fi_i_{it} coefficient is positive and significant, while the $fi_i_{square_{it}}$ coefficient is negative and significant, there is evidence of an inverted-U hypothesis. This implies that as financial inclusion increases, the incremental effect on the $lginico$ ($lpalma$) falls. On the other hand, if both variables have a positive sign, it will indicate that as fi_i increases, the incremental effect on the $lginico$ ($lpalma$) also increases (Segning et al., 2023). However, if the fi_i_{it} is negative and significant, while $fi_i_{square_{it}}$is positive and significant, then the study validates evidence of a U-shaped hypothesis. A U-shaped relationship exists if the dependent variable (i.e. income inequality) first decreases with the independent variable (i.e. financial inclusion) at a decreasing rate to reach a turning point, after

which the dependent variable (income inequality) increases at an increasing rate as the independent variable (financial inclusion) continues to rise (Haans, Pieters & He, 2016). The Palma ratio is used as a robustness check for the non-linear relationship between the overall financial inclusion index and income inequality in 25 African countries, as shown in equation (5.15).

5.7 Conclusion

The chapter described the data and empirical techniques adopted by the study to investigate the impact of financial inclusion on income inequality across 25 African countries. Particularly, the chapter discussed in detail the nature of the data and variables used in the study. It presented the technique used to construct the sub-indices for financial access, penetration and usage, as well as the overall financial inclusion index. Then, a discussion of the preliminary tests used to identify the suitable testing techniques for the study was provided. This was followed by the justification of the use of the two-step system GMM by Arellano and Bover (1995) and Blundell and Bond (1998) as a suitable testing technique for investigating the association between these variables. In addition, the chapter provided an overview of the quantile regression by Koenker and Bassett (1978) employed to determine whether there is a differential impact of financial inclusion on income inequality when the level of inequality varies across the sample of African countries. Furthermore, for robustness checks, the inclusion of an alternative measure of income inequality (the Palma ratio) and an additional control variable (Property rights) was explained and justified. Lastly, the chapter also provided an overview of how the two-step system GMM will be used to investigate whether there is a non-linear relationship between financial inclusion and income inequality.

CHAPTER 6
PRESENTATION OF RESULTS AND INTERPRETATION

6.1 Introduction

This chapter presents the empirical findings of the relationship between financial inclusion and income inequality in 25 African countries and interprets them in relation to the study's objectives and theoretical framework. The study uses various models to achieve its objectives. In section 6.2, the study presents the construction of the financial inclusion indices, namely, access, penetration, and usage, and the overall financial inclusion index. The variables used in the construction are presented in the pairwise correlation table. Section 6.3 presents the results from descriptive statistics and pairwise correlation. In section 6.4, the diagnostic tests, including panel unit root, cross-sectional dependency, time fixed effects, heteroskedasticity, multicollinearity, and serial correlation tests, are presented.

In section 6.5, the study presents and discusses the findings of the linear and non-linear relationship between financial inclusion and income inequality. Particularly, in subsections 6.5.1 and 6.5.2, the study provides findings on the linear association using evidence from the two-step system GMM and quantile regression. In subsection 6.5.3, the study presents the empirical findings on the non-linear relationship between financial inclusion and income inequality using a two-step system GMM with a squared term. In section 6.6, the study discusses the robustness check results using an alternative measure of income inequality, the Palma ratio and an additional control variable, property rights, which captures institutional factors. In section 6.7, the study summarises the results. Lastly, section 6.8 concludes the chapter.

6.2 Constructing Financial Inclusion Indices

The aim of this section is to construct financial inclusion indices, namely, access, penetration, usage and the overall index. To achieve this goal, this study employs access, penetration and usage dimensions to measure financial inclusion. To measure the access dimension, this study uses four proxies, namely, ATMs per 100,000 adults, AMTs per 1,000 km², commercial banks per 100,000 adults and remittances. Penetration is measured by the number of deposit accounts with commercial banks per 1,000 adults, and the number of commercial bank branches per 1,000 km².

Usage uses two proxies, namely, domestic credit to the private sector as a percentage of GDP, and gross domestic savings as a percentage of GDP. Before analysing these variables, the study applies the first step of the PCA, which involves normalising the variables. The normalised values will show each country's level of the variables used as proxies for financial inclusion, relative to a minimum value of 0 and a maximum value of 1, across different years and countries.

This section is divided into four subsections. First, the study computes the pairwise correlations for each of the eight proxies in subsection 6.2.1. Second, in subsection 6.2.2, a validity test is conducted on the eight proxies using the Kaiser-Meyer-Olkin (KMO) test to determine which proxies are suitable for developing the financial inclusion indices. Sections 6.2.3 and 6.2.4 discuss the results of the first and second stages of PCA.

6.2.1 Pairwise Correlation for Financial Inclusion Proxies

To determine the direction of the financial inclusion proxies relative to one another, the study computes the pairwise correlation for each of the eight proxies. According to Table 6.1, Nlatms[14], Nlatms_per1,000 km^2, Nlbranches, NldepositAccounts, Nlbranches_per 1,000 km2 and Nlcredit show a strong to very strong positive correlation among themselves. Nlremittances and Nsavings are shown to have weaker or negative correlations with the other variables in this set, as well as a moderate negative relationship with each other. Table 6.1 presents the results for the pairwise correlation matrix.

Table 6. 1: Pairwise correlation matrix

Variables	1	2	3	4	5	6	7	8
Nlatms (1)	1.000							
Nlatms_per 1,000 km^2 (2)	0.633	1.000						
	(0.000)							
Nlbranches (3)	0.706	0.668	1.000					
	(0.000)	(0.000)						
Nlremittances (4)	-0.109	0.125	0.010	1.000				
	(0.025)	(0.010)	(0.830)					
NldepositAccounts (5)	0.819	0.696	0.726	-0.049	1.000			
	(0.000)	(0.000)	(0.000)	(0.318)				
Nlbranches_per 1,000 km^2 (6)	0.310	0.899	0.627	0.162	0.481	1.000		
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)			
Nlcredit (7)	0.748	0.568	0.673	-0.161	0.640	0.406	1.000	
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)		

[14] The N on the Nlatms represents the normalised variable.

Nsavings (8)	0.098	-0.230	-0.076	-0.466	0.063	-0.311	-0.031	1.000
	(0.044)	(0.000)	(0.119)	(0.000)	(0.195)	(0.000)	(0.523)	

Source: Computed by the author on STATA 18. Note: Probabilities are in parentheses

6.2.2 Validity of the Financial Inclusion Indices

Before constructing the indices, the study conducted the KMO measure of a sampling adequacy test to evaluate the suitability of the variables for index construction, following the studies by AlTi Tiedemann Global (2025) and El Bourainy et al. (2021). The KMO is widely used to test the goodness of fit of the PCA and FA. The KMO score should be 0.500 and above (AlTi Tiedemann Global, 2025). Table 6.2. shows the KMO values for all eight proxies and the KMO values for the final proxies to be added in constructing the indices after removing remittances. In this study, the KMO score is between 0.500 and 0.732 for all components except remittances. Therefore, remittances are removed (score is 0.214). Other proxies are considered because their score is between 0.500 and 0.768 after rerunning the KMO without remittances. As a result, the financial inclusion indices include a total of seven proxies: access dimension; this study uses three proxies, namely, ATMs per 100,000 adults, ATMs per 1,000 km^2, and commercial banks per 100,000 adults. Penetration is measured by the number of deposit accounts with commercial banks per 1,000 adults, and the number of commercial bank branches per 1,000 km^2. Usage uses two proxies, namely, domestic credit to the private sector as a percentage of GDP, and gross domestic savings as a percentage of GDP. Table 6.2 shows the KMO results of the proxies used to measure the financial inclusion indices.

Table 6. 2: KMO values

Dimension	**Variable**	**KMO values for all eight proxies**	**KMO values for the final proxies**
Access	Nlatms	0.694	0.729
	Nlatms per 1,000 km^2	0.732	0.768
	Nlbranches	0.710	0.701
	Nlremittances	0.214	-
Penetration	NldepositAccounts	0.500	0.500
	Nlbranches_per 1,000 km^2	0.500	0.500
Usage	Nlcredit	0.500	0.500
	Nsavings	0.500	0.500

Source: Computed by the author on STATA 18

6.2.3 First Stage of PCA

The PCA approach determines the eigenvalues of the components of seven proxies for access, penetration and usage dimensions and estimates the sub-indices. The component with the highest eigenvalue, which is greater than 1, has a higher variance and is considered for the analysis (Nguyen, 2021). These eigenvalues show the amount of variance that each principal component explains. Tables 6.3, 6.4 and 6.5 present the results of the first stage PCA. As shown in the tables below, only the first components of the proxies have eigenvalues that are greater than 1. As a result, only the weights assigned to the first component are used to estimate financial inclusion access, penetration and usage sub-indices. For instance, in Table 6.3, component 1 explains approximately 78.000 percent of the dataset, whereas the second and third explain about 12.400 percent and 9.600 percent, respectively. In addition, in Table 6.4, component 1 explains approximately 74.100 percent of the dataset, whereas the second component explains about 26.000 percent, respectively. Moreover, Table 6.5, component 1 explains approximately 51.600 percent of the dataset, whereas the second component explains roughly 48.500 percent. The study followed this approach to reduce the number of indicators from seven to three constructed financial inclusion sub-indices using the first components. Tables 6.3, 6.4 and 6.5 provide the results of PCA estimation for financial inclusion access, penetration and usage.

Table 6. 3: Principal components' estimates of financial inclusion access

Component	**Eigenvalue**	**Difference**	**Proportion**	**Cumulative**
1	2.339	1.966	0.780	0.780
2	0.373	0.084	0.124	0.904
3	0.289	.	0.096	1.000
Principal components (eigenvectors)				
Variables	Component 1	Component 2	Component 3	Unexplained
Nlatms	0.578	-0.566	0.588	0
Nlatms_per 1,000 km^2	0.567	0.797	0.211	0
Nlbranches	0.588	-0.211	-0.781	0

Source: Computed by the author on STATA 18

Table 6. 4: Principal components' estimates of financial inclusion penetration

Component	**Eigenvalue**	**Difference**	**Proportion**	**Cumulative**
1	1.481	0.962	0.741	0.741
2	0.519	.	0.260	1.000
Principal components (eigenvectors)				
Variables	Component 1	Component 2	Unexplained	
NldepositAccounts	0.707	0.707	0	

Nlbranches_per 1,000 km^2	0.707	-0.707	0	

Source: Computed by the author on STATA 18

Table 6. 5: Principal components' estimates of financial inclusion usage

Component	**Eigenvalue**	**Difference**	**Proportion**	**Cumulative**
1	1.031	0.062	0.516	0.516
2	0.969	.	0.485	1.000
Principal components (eigenvectors)				
Variables	Component 1	Component 2	Unexplained	
Nlcredit	-0.707	0.707	0	
Nsavings	0.707	0.707	0	

Source: Computed by the author on STATA 18

6.2.4 Second Stage of PCA

Using the same procedure outlined in the first stage, the second stage of the PCA is applied to the three sub-indices (access, penetration and usage) to determine their weights in the overall financial inclusion index. The results of the principal component estimation for the overall financial inclusion index are presented in Table 6.6. The eigenvalues of the three components are 2.344, 0.552 and 0.104, respectively. Component 1 is chosen because it explains approximately 78.100 percent of the dataset, whereas the second and third explain about 18.400 percent and 3.500 percent, respectively. Therefore, only the first component is considered because it has an eigenvalue greater than 1. The weights, indicated in the eigenvectors, for the three dimensions are 0.618, 0.606 and -0.501, respectively. Table 6.6 presents the results for PCA estimation for the financial inclusion index.

Table 6. 6: Principal components' estimates of the financial inclusion index

Component	**Eigenvalue**	**Difference**	**Proportion**	**Cumulative**
1	2.344	1.792	0.781	0.781
2	0.552	0.447	0.184	0.965
3	0.104	.	0.035	1.000
Principal components (eigenvectors)				
Variables	Component 1	Component 2	Component 3	Unexplained
fi_access	0.618	0.302	0.726	0
fi_penetration	0.606	0.406	-0.684	0
fi_usage	-0.501	0.863	0.068	0

Source: Calculated by the author on STATA 18

By assigning the weights shown in the above table to equation 5.7, the study derives equation 6.1 below for the overall financial inclusion index.

$$FI_I_{it} = 0.618\, DIM_{1,it}^{Ac} + 0.606 DIM_{2,it}^{Pn} - 0.501 DIM_{3,it}^{Us} \quad (6.1)$$

6.3 Results for Descriptive Statistics and Pairwise Correlation

This section provides a statistical analysis of the variables used in this study. Given data fluctuations across countries, we present the control variables in logarithmic form to normalise their distribution and equalise variances between the groups (Livingston, 2004). Table 6.7 shows the descriptive statistics for each variable. In total, the study has 425 observations. The mean provides the average value for each variable, while the standard deviation captures the degree of dispersion of each variable. The minimum and maximum represent the lowest and highest values for each variable in the study, respectively (Livingston, 2004). As shown in the table below, the Gini coefficient, financial inclusion indices and overall index have the lowest mean values, while population has the highest mean value. The standard deviation results show that the population, financial inclusion index (fi_i) and financial inclusion access (fi_access) exhibit the highest dispersion. This suggests that the data points are spread far from the mean, showing a possible heterogeneity across the cross-sections for the variables.

The pairwise correlation for all variables is presented in Table 6.8. Regarding lginico, the table shows that the financial inclusion proxies – fi_access, fi_penetration and fi_i – each have a negative correlation. However, the relationship is statistically significant for fi_penetration and fi_i proxies, while it is statistically insignificant for fi_access proxy. This suggests that increases in financial inclusion penetration and aggregate financial inclusion are expected to reduce income inequality as measured by the Gini coefficient (lginico) in the selected African countries. On the other hand, financial inclusion usage (fi_usage) has a positive and statistically significant correlation, respectively. This implies that an increase in fi_usage is anticipated to increase income inequality in the selected African countries.

All proxies for financial inclusion demonstrate a negative relationship with the income inequality proxy, lpalma. While fi_usage is statistically insignificant, fi_access, fi_penetration, and fi_i are all statistically significant. This suggests that an increase in financial inclusion may negatively

affect income inequality as measured by lpalma. In relation to the lginico, all control variables show a negative but insignificant relationship, except for lpropertyrights, showing a positive, insignificant relationship. In contrast, when examining lpalma, the log of GDP per capita (lGDPpcap) and Property rights (lPropertyrights) have a negative and statistically significant relationship. Meanwhile, the log of trade (ltrade) and the log of government spending (lgovernment) show positive, statistically significant relationships. Although inflation shows a positive relationship and population has a negative one, both are statistically insignificant. The descriptive statistics are summarised in Table 6.7, and the pairwise correlation matrix is presented in Table 6.8.

Table 6. 7: Descriptive statistics results

	Observations	**Mean**	**SD**	**Min**	**Max**
lginico	425	-0.536	0.095	-0.760	-0.342
lpalma	425	1.495	0.542	0.196	2.720
fi_access	425	0	1.529	-5.242	3.486
fi_penetration	425	0	1.217	-3.638	2.851
fi_usage	425	0	1.015	-1.833	3.830
fi_i	425	0	1.531	-5.819	3.382
lGDPpcap	425	7.461	0.985	5.569	9.877
ltrade	425	4.230	0.464	3.102	5.403
lgovernment	425	2.730	0.448	0.716	3.772
lPropertyrights	425	1.449	0.322	0.148	2.061
linflation	425	4.860	0.474	3.987	9.313
lpopulation	425	16.083	1.599	11.346	18.540

Source: Calculated by the author on STATA 18

Table 6. 8: Correlation matrix for the sample

Variables	1	2	3	4	5	6	7	8	9	10	11	12
Lginico (1)	1.000											
Lpalma (2)	0.701	1.000										
	(0.000)											
fi_access (3)	-0.054	-0.118	1.000									
	(0.269)	(0.015)										
fi_penetration (4)	-0.141	-0.270	0.893	1.000								
	(0.004)	(0.000)	(0.000)									
fi_usage (5)	0.158	-0.031	-0.577	-0.524	1.000							
	(0.001)	(0.525)	(0.000)	(0.000)								
fi_i (6)	-0.129	-0.144	0.946	0.928	-0.767	1.000						
	(0.008)	(0.003)	(0.000)	(0.000)	(0.000)							
lGDPpcap (7)	-0.016	-0.208	0.714	0.588	-0.189	0.583	1.000					
	(0.745)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)						
ltrade (8)	-0.004	0.086	0.310	0.182	-0.099	0.229	0.474	1.000				
	(0.927)	(0.076)	(0.000)	(0.000)	(0.041)	(0.000)	(0.000)					
lgovernment (9)	-0.019	0.133	0.267	0.101	-0.417	0.284	0.267	0.477	1.000			
	(0.702)	(0.006)	(0.000)	(0.038)	(0.000)	(0.000)	(0.000)	(0.000)				
lPropertyrights (10)	0.001	-0.149	0.426	0.475	-0.145	0.407	0.463	-0.008	0.028	1.000		
	(0.989)	(0.002)	(0.000)	(0.000)	(0.003)	(0.000)	(0.000)	(0.875)	(0.563)			
linflation (11)	-0.079	0.000	0.106	0.154	-0.001	0.104	-0.060	-0.148	-0.050	-0.114	1.000	
	(0.103)	(0.997)	(0.029)	(0.001)	(0.982)	(0.032)	(0.215)	(0.002)	(0.300)	(0.018)		
lpopulation (12)	-0.077	-0.065	-0.340	-0.273	0.116	-0.283	-0.394	-0.687	-0.438	-0.073	0.158	1.000
	(0.111)	(0.182)	(0.000)	(0.000)	(0.017)	(0.000)	(0.000)	(0.000)	(0.000)	(0.133)	(0.001)	

Source: Calculated by the author on STATA 18. Note: Probabilities are in parentheses

6.4 Diagnostic Test Results

This section presents the diagnostic findings from various tests, including the unit root, the cross-sectional dependency, time fixed effects, heteroskedasticity, multicollinearity, and serial correlation tests.

6.4.1 Unit Root Tests

The Levin-Lin-Chu (LLC) panel unit root test was conducted to examine the stationarity of the variables included in the study, as shown in Table 6.9. The test assumes a common unit root process across all panels under the null hypothesis. At the 5 percent significance level, we reject the null hypothesis since the p-value is less than 0.050, concluding that the variables are stationary across the panels. The Im-Pesaran-Shin (IPS) panel unit root test was applied to the variables included in the study. The test's null hypothesis is that all panels contain a unit root, while the alternative hypothesis is that at least some panels are stationary. At the 5 percent significance level, we reject the null hypothesis, concluding that the variables are stationary for at least some panels. Table 6.9 presents the panel unit root test with evidence from the LLC and IPS tests.

Table 6. 9: LLC and IPS unit root tests

LLC		**IPS**	
Variables	**Order of integration at level I(0)**	**Order of integration at level I(0)**	
	Without trend	Without trend	With trend
lginico	-4.930*** 0.000	-2.411*** 0.008	-
lpalma	-8.420*** 0.000	-3.533*** 0.000	-
fi_access	-8.406*** 0.000	-7.890*** 0.000	-
fi_penetration	-7.626*** 0.000	-3.590*** 0.000	-
fi_usage	-5.883*** 0.000	-2.622*** 0.004	-
fi_i	-11.408*** 0.000	-5.357*** 0.000	-
lGDP_pcap	-3.184*** 0.001	-1.898** 0.029	-
ltrade	-3.513*** 0.000	-1.465* 0.072	-
lgovernment	-5.295*** 0.000	-2.458*** 0.007	-

lPropertyrights[15]	-6.8432*** 0.0000	-	-
linflation	-3.531*** 0.000	-	-3.584*** 0.000
lpopulation	-9.437*** 0.000	-	-2.181** 0.015

Source: Calculated by the author on STATA 18. Note: *, ** and *** denote stationarity of variables at 10 percent, 5 percent and 1 percent level of significance, respectively; – denotes not applicable. IPS critical values -1.950(1%), -1.820(5%), -1.750(10%). CIPS critical values -2.070(10%), -2.150(5%), -2.320(1%).

Table 6.9 shows that all the variables are stationary at the level I(0) for both the LLC and the IPS tests. Since all the variables are stationary at the level, the study does not need to conduct a cointegration test, because the variables are already in a state of equilibrium. On page 255 of their paper, Engle and Granger (1987) stated that "*equilibrium is a stationary point characterised by forces which tend to push the economy back toward equilibrium whenever it moves away*". Therefore, cointegration testing was introduced for non-stationary time series variables (Engle & Granger, 1987; Granger, 1981; Yussuf, 2022). Furthermore, in the following subsections, the study performs a cross-sectional dependency test (using Pesaran and Friedman tests), time fixed effects (using the Wald test), heteroskedasticity test (using Breusch-Pagan test), multicollinearity test (using Variance Inflation Factor (VIF)) and serial correlation test (using Wooldridge test).

6.4.2 Cross-sectional Dependence Results

To test for cross-sectional dependency in the models, the Pesaran and Friedman tests are used. The results in Table 6.10 below prove the absence of cross-sectional dependency in the models. This means that the variables in the model do not depend on each other. Table 6.10 presents the Pesaran and Friedman tests' results for cross-sectional dependency.

[15] The IPS unit root could not be estimated due to sample limitations related to time dimension and distributional requirements. However, the Levin-Lin-Chu (LLC) test was successfully implemented and indicates that the variable is stationary at the level. Given its suitability for panels with relatively small time dimensions, the LLC results are considered reliable.

Table 6. 10: Cross-sectional independence tests

Models	Pesaran test (2004)	Friedman test (1937)
lginico		
1	Pesaran's test of cross-sectional independence = -0.574, Pr = 0.566	Friedman's test of cross-sectional independence = 14.231, Pr = 0.941
2	Pesaran's test of cross-sectional independence = -0.556, Pr = 0.578	Friedman's test of cross-sectional independence = 14.300, Pr = 0.940
3	Pesaran's test of cross-sectional independence = -0.714, Pr = 0.475	Friedman's test of cross-sectional independence = 12.373, Pr = 0.975
4	Pesaran's test of cross-sectional independence = -0.640, Pr = 0.522	Friedman's test of cross-sectional independence = 14.598, Pr = 0.932
lpalma		
5	Pesaran's test of cross-sectional independence = -0.921, Pr = 0.357	Friedman's test of cross-sectional independence = 16.235, Pr = 0.879
6	Pesaran's test of cross-sectional independence = -1.270, Pr = 0.204	Friedman's test of cross-sectional independence = 15.322, Pr = 0.911
7	Pesaran's test of cross-sectional independence = -0.536, Pr = 0.592	Friedman's test of cross-sectional independence = 16.078, Pr = 0.885
8	Pesaran's test of cross-sectional independence = -1.199, Pr = 0.230	Friedman's test of cross-sectional independence = 17.578, Pr = 0.823

Source: Calculated by the author on STATA 18. Note: Models 1 and 5 present fi_access; models 2 and 6 present fi_penetration; models 3 and 7 present fi_usage; models 4 and 8 present fi_i results, respectively.

6.4.3 Time Fixed Effects Test Results

The study used the Wald test to determine the existence of time fixed effects, to check whether including time dummies improves the models. In Table 6.11, the p-values for the lginico and lpalma are above the 0.050 level of significance. Therefore, the study fails to reject the null hypothesis that all time fixed effects are jointly zero and that no time dummies are needed. Table 6.11 presents the results for time fixed effects.

Table 6. 11: Time fixed effects test results

Dependent variable	Results
lginico	F(16, 399) = 0.720 Prob > F = 0.773
lpalma	F(16, 400) = 0.770 Prob > F = 0.725

Source: Calculated by the author on STATA 18

6.4.4 Heteroskedasticity Test Results

To test for the existence of heteroscedasticity, the Breusch-Pagan test is used. The result indicates a statistically significant value (less than 0.050), leading to the rejection of the null hypothesis of

homoskedasticity, as shown in Table 6.12 below. Consequently, these models exhibit a heteroscedasticity problem, showing that the variance of the error terms is not constant across the levels of independent variables. Table 6.12 presents the heteroskedasticity results from the Breusch-Pagan test.

Table 6. 12: Heteroskedasticity test results

Dependent variable	**Results**
lginico	chi2(1) = 32.490 Prob > chi2 = 0.000
lpalma	chi2(1) = 7.760 Prob > chi2 = 0.005

Source: Calculated by the author on STATA 18

6.4.5 Multicollinearity Test Results

Table 6.13 below shows the results for the Variance Inflation Factor (VIF) test for multicollinearity. The results show that the data do not suffer from multicollinearity, with VIFs between 1 and 8, which is below 10 and is usually not problematic. Multicollinearity is a statistical phenomenon that occurs in regression analysis when two or more independent variables (predictors) in a model are highly correlated with each other. This high correlation means the variables essentially carry redundant or overlapping information, making it difficult for the regression model to accurately estimate the individual effects of each correlated variable on the dependent variable. While some sources suggest that a VIF above 5 may indicate potential multicollinearity, a more widely accepted rule of thumb considers VIF values above 10 as indicative of serious multicollinearity (O'Brien, 2007). Therefore, in this study, VIF values below 10 are deemed acceptable, and multicollinearity is not considered problematic, even if some variables exceed 5. Table 6.13 shows the results of the multicollinearity test.

Table 6. 13: Results for multicollinearity

Variable	**VIF**
fi_access	8.770
fi_penetration	6.430
lGDPpcap	3.240
ltrade	2.450
fi_usage	2.380
lpopulation	2.160
lgovernment	1.910
lPropertyrights	1.610

fi_i	1.740
linflation	1.210

Source: Calculated by the author on STATA 18

6.4.6 Serial Correlation (Autocorrelation) Test Results

To test for the presence of serial correlation, the Wooldridge test is applied. The results presented in Table 6.14 show a significant probability value, which is less than 0.050. As a result, we reject the null hypothesis and conclude that the models have a serial correlation problem. Table 6.14 presents serial correlation results from the Wooldridge test.

Table 6. 14: Results for serial correlation

Dependent variable	**Results**
lginico	F(1, 24) = 130.426 Prob > F = 0.000
lpalma	F(1, 24) = 136.559 Prob > F = 0.000

Source: Calculated by the author on STATA 18

6.5 Estimation Results and Discussion

6.5.1 Results on the Effect of Financial Inclusion on Income Inequality

The aim of this section of the study is to achieve objectives one to four, which is to test the impact of financial inclusion on income inequality (measured by the Gini coefficient). The results of diagnostic tests indicate that the data for this study do not exhibit time fixed effects or multicollinearity. However, the results do show the presence of heteroskedasticity and serial correlation. To address these issues, the study employed the two-step system Generalised Method of Moments (GMM), which effectively accounts for heteroskedasticity and autocorrelation issues in the model (Arellano & Bover, 1995; Blundell & Bond, 1998; Menyelim et al., 2021). In this section, we discuss four sets of two-step system GMM estimation results presented as separate models in Table 6.15. Model 1 presents the results of the two-step system GMM using the composite measure of financial access (i.e. fi_access) as the primary independent variable. It also includes the lagged natural log of the dependent variable (i.e. L.lginico) along with a set of macroeconomic variables, which include the natural log of GDP per capita (i.e. lGDPpcap), government expenditure (i.e. lgovernment), trade (i.e. ltrade), inflation (i.e. linflation), and population (i.e. lpopulation) as secondary independent variables. In models 2, 3 and 4, the study

presents the results of the two-step system GMM with the primary independent variables being the composite measures of financial penetration (i.e. fi_penetration), usage (i.e. fi_usage) and the overall index (i.e. fi_i). Table 6.15 shows the results concerning the impact of financial access, penetration, usage, and the overall index on income inequality.

Table 6. 15: Financial inclusion and Gini coefficient

	Model 1	**Model 2**	**Model 3**	**Model 4**
	fi_access	fi_penetration	fi_usage	fi_i
Dependent variable	lginico	lginico	lginico	lginico
L.lginico	1.078***	1.061***	1.028***	1.071***
	(0.033)	(0.027)	(0.032)	(0.039)
fi_access	-0.005***	-	-	-
	(0.002)	-	-	-
fi_penetration	-	-0.005**	-	-
	-	(0.003)	-	-
fi_usage	-	-	0.010***	-
	-	-	(0.004)	-
fi_i	-	-	-	-0.006**
	-	-	-	(0.003)
lGDPpcap	0.017***	0.017***	0.014***	0.020***
	(0.004)	(0.005)	(0.003)	(0.006)
lgovernment	0.010**	0.010*	0.013***	0.008
	(0.004)	(0.006)	(0.005)	(0.005)
ltrade	-0.012**	-0.016**	-0.012***	-0.015**
	(0.005)	(0.006)	(0.004)	(0.007)
linflation	0.006***	0.005**	0.000	0.004**
	(0.002)	(0.002)	(0.001)	(0.002)
lpopulation	0.002**	0.002	0.002**	0.002
	(0.001)	(0.002)	(0.001)	(0.001)
Constant	-0.129***	-0.115**	-0.113***	-0.126**
	(0.039)	(0.045)	(0.039)	(0.052)
Observations	400	400	400	400
Number of countryid	25	25	25	25
Instruments	20	20	20	20
AR(1) test	0.004	0.004	0.003	0.004
AR(2) test	0.892	0.844	0.606	0.824
Hansen test	0.439	0.325	0.095	0.207

Source: Calculated by the author on STATA 18. Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

6.5.1.1 Discussion of Financial Inclusion Access Results

The first variable of interest is the lagged dependent variable (i.e. L.lginico). In Table 6.15, the results from models 1 to 4 indicate that the lagged dependent variable (i.e. L.lginico) has a positive and statistically significant relationship in the selected African countries during the study period. This means that high income inequality in the preceding period is a predictor of a higher level of

income inequality in the present period. Specifically, if income inequality increases by one percent in the previous period, all other things being equal, it is expected to increase by one percent in the current period. These results align with the theoretical framework of intergenerational inequality (Loury, 1981) as well as the empirical research of Abdulkarim and Ali (2019) and Menyelim et al. (2021). These results provide strong evidence for the concept of persistent income inequality, suggesting that factors contributing to this inequality are not merely temporary; rather, they have long-lasting effects. Higher income inequality in one period creates conditions for continued high-income inequality in subsequent periods. Therefore, policies aimed at reducing income inequality must be sustainable and involve long-term strategies. Given the persistent nature of income inequality in Africa, a once-off policy intervention is unlikely to be sufficient to change the path of income distribution in the region.

Regarding financial access (i.e. fi_access), the results show that it negatively impacts income inequality in the selected African countries during the study period. Specifically, a one unit increase in fi_access reduces income inequality by about 0.499 [16]percent. The negative coefficient of financial access is consistent with theory, suggesting that as the financial system matures and access expands, barriers to entry decline, enabling broader participation and thus reducing income inequality. This finding is also consistent with the education transmission mechanism (Klapper et al., 2006; Segning et al., 2023) as well as empirical studies by Honohan (2008), Kling et al. (2022), and Sukmana and Ibrahim (2018). The measures of fi_access used – such as the ATMs per 100,000 adults, ATMs per 1000 km^2, and commercial banks per 100,000 adults – indicate that increased access to financial institutions fosters inclusivity and reduces income inequality. Access to formal financial services and products, such as credit, can enable poor households to invest in small businesses, education and training, thereby increasing income-generating activities and reducing income inequality (Demirgüç-Kunt & Klapper, 2012; Nkuna et al., 2018; Raihanath & Pavithran, 2014; Segning et al., 2023).

[16] The study reports the effects of financial access, penetration, usage and the overall index using the antilogs of the estimated coefficients rather than the raw coefficient values. This approach converts the log-base estimates back to the original scale of the dependent variables, allowing interpretation in percentages.

Additionally, the education channel explains that access to financial services and products contributes to reducing income inequality when previously disadvantaged people use this access to enhance their educational opportunities (Klapper et al., 2006; Segning et al., 2023). With access to formal financial services and products, poorer individuals can obtain credit to invest in education and skills development (Sharma, 2016). Moreover, promoting financial access may encourage small business development and entrepreneurship, ultimately leading to job creation. This, in turn, contributes to reducing income inequality (Tita & Aziakpono, 2017).

6.5.1.2 Discussion of Financial Inclusion Penetration Results

Model 2 in Table 6.15 presents the results of financial penetration (i.e. fi_penetration) following the analysis of access to financial services and products. While access reflects the availability of financial services and products, penetration measures their actual distribution. Similar to the fi_access results, the findings indicate a negative and statistically significant impact. That is, fi_penetration reduces income inequality in selected African countries during the period under review. In the context of the 25 African countries in the study, a one unit increase in fi_penetration reduces income inequality by 0.499 percent. The measures of fi_penetration used – such as the number of deposit accounts with commercial banks per 1,000 adults, and the number of commercial bank branches per 1,000 km^2 – indicate that increased penetration of financial services and products reduces income inequality.

These results align with the study's theoretical framework, suggesting that as financial services become more widespread across the population, barriers to inclusion decline, enabling broader participation and reducing income inequality (Aghion & Bolton, 1997), as well as an empirical study by Verma and Giri (2022). The inclusion of more consumers by reducing participation costs for the poor helps reduce income inequality. Thus, the offered and available financial services and products will penetrate extensively among different groups of consumers in society (Sarma, 2008; Sawadogo & Semedo, 2021).

6.5.1.3 Discussion of Financial Inclusion Usage Results

After examining the impact of financial access and penetration dimensions, the study moves to examine the impact of the actual usage of financial services and products in model 3. Contrary to

the effect of access and penetration and the study's expected sign based on the theoretical framework, the empirical findings indicate that financial usage (i.e. fi_usage) positively affects income inequality in the selected African countries during the study period. That is, a one percent increase in fi_usage will increase income inequality by 1.005 percent. The findings differ from those of Kebede et al. (2023) and Demir et al. (2022), who found a negative impact. The measures of fi_usage employed – such as domestic credit to the private sector as a percentage of GDP, and gross domestic savings as a percentage of GDP – indicate that increased use of these financial services and products increases income inequality. These different findings may stem from the fact that this study used a composite index of usage rather than an individual set of variables and from the use of different proxies to measure usage. In addition, this positive impact of financial usage can be explained by credit market theory. In the presence of information asymmetries, access to and use of credit is often skewed towards wealthier individuals, who are better positioned to meet the lending requirements, such as collateral and creditworthiness. As a result, these individuals are able to invest in high-return opportunities and accumulate assets more rapidly than low-income groups, thereby widening income inequality. Consequently, in imperfect credit markets, the use of financial services may worsen rather than reduce income inequality (Aghion & Bolton, 1997; Banerjee & Newman, 1993; Galor & Zeira, 1993). The effect of financial usage on income inequality, therefore, depends on the extent of financial market imperfections. In theory, as capital accumulation increases, more resources become available for investment, enabling individuals, particularly the poor, to improve their economic outcomes. However, in the presence of market frictions such as asymmetric information, high contract enforcement costs, moral hazard and wealth constraints, access to financial services does not translate into equal usage. Instead, the effective utilisation of financial services and products depends on existing wealth, collateral and financial capability (Aghion & Bolton, 1992; Galor & Zeira, 1993). This challenge is particularly evident in Africa. Despite national strategies aimed at promoting financial inclusion, the financial system remains relatively less inclusive, with uneven use of financial services and products across the population. Indicators of financial usage, such as the proportion of adults who save or borrow from financial institutions, highlight the limited outreach of the banking sector. For instance, only 12 percent of the population in Africa save at formal financial institutions, while just 9 percent have a line of formal credit (World Bank, 2024a). In this context, financial inclusion, particularly in terms of usage, may initially worsen income inequality rather than reduce it.

6.5.1.4 Discussion of Financial Inclusion Index Results

Following the investigation of the impact of financial inclusion dimensions, access, penetration and usage on income inequality, the study employs the overall index of financial inclusion in model 4. The findings from the financial inclusion index (i.e. fi_i) on income inequality (lginico) indicate a statistically negative impact. Specifically, fi_i corresponds to a decrease in income inequality across the selected African countries during the study period. In the context of the 25 African countries examined, a one unit increase in fi_i reduces income inequality by 0.598 percent. This suggests that financial inclusion effectively reduces income inequality in the selected African countries. These results align with the theory, indicating that financial inclusion in a financial system with minimal financial imperfections, enables low-income individuals to access investment opportunities and credit based on ability and the execution of business ideas, not on wealth, thus promoting entrepreneurship, leading to employment and productivity, and reducing income gaps (Aghion & Bolton, 1997; Klapper et al., 2006), as well as empirical studies of Azim (2022), Chinnakum (2023), Huang and Zhang (2020), Kim (2016), Omar and Inaba (2020) and Seifelyazal et al. (2023).

However, they differ from the findings of Agyemang-Badu et al. (2018), Md Jamil et al. (2024) and Wong et al. (2023), who found inconclusive outcomes. These different findings may stem from varying measures of financial inclusion employed in the study and from the fact that the study used an overall index composed of access, penetration and usage dimensions rather than a composite index derived from individual variables. A possible explanation for this reducing effect on income inequality is that increased financial inclusion improves the availability and movement of capital, which in turn fosters entrepreneurship. Over time, this leads to employment creation and productivity improvements, thus reducing the income gap between the wealthy and the poor both in the present and in the future (Klapper et al., 2006; Segning et al., 2023).

After investigating the impact of the main independent variables (i.e. fi_access, fi_penetration, fi_usage and fi_i), the study assessed the impact of macroeconomic variables (i.e. lGDPpcap, ltrade, lgovernment, linflation and lpopulation). The findings revealed that some results for the control variables are contrary to the study's expectations, while others align with them (see models 1, 2, 3 and 4 in Table 6.15). Notably, the results for GDP per capita (lGDPpcap) and redistributive

policies (lgovernment) are contrary to anticipated outcomes. Both variables show a positive and statistically significant impact on income inequality in the selected African countries. The effect of lGDPpcap is significant across all models, whereas the significance of lgovernment is observed in models 1 to 3. These findings differ from those reported by Demir et al. (2022), suggesting that in the context of 25 African countries, economic growth may lead to higher income inequality. High economic growth does not automatically result in a reduction in income inequality, as the benefits of growth are not distributed evenly across the different groups in society (Demir et al., 2022; Beck, Demirgüç-Kunt & Levine, 2007; Odusola, 2017). Additionally, regarding redistributive policies, income inequality increases because government interventions are undermined by weak institutions and corruption, which reduces the effectiveness of redistribution strategies (Li et al., 2000). Furthermore, it worsens income inequality if it's mostly allocated to sectors accommodating the high-income groups (Odusola, 2017; Kebede et al., 2023).

The findings regarding trade, inflation, and population demonstrate the expected outcomes. In all models, the findings for trade are negative and statistically significant. For inflation, significance is found in models 1,2 and 4, while for population, significance is observed in models 1 and 3. The results related to trade align with the conclusions drawn by Mushtaq and Bruneau (2019) and Demir et al. (2022). They highlight that trade reduces income inequality in developing regions such as Africa by increasing the wages of low-skilled workers (Chu-Khanh & Chu, 2018). Inflation has a positive impact on income inequality, consistent with the findings of Abdulkarim and Ali (2019) and Jaumotte et al. (2013). High levels of inflation exacerbate income inequality by reducing real wages and skewing earnings in favour of profit takers rather than the workers (Lee & Lee, 2018). Population, on the other hand, also positively affects income inequality. As the population increases, income inequality in Africa also increases. These findings correspond with empirical research conducted by Neaime and Gaysset (2018). It suggests that without corresponding growth in economic resources, an increasing population leads to reduced availability of resources. This situation burdens society and results in a fall in capital per person, further reducing the distribution to poorer communities (Jaumotte et al., 2013; Neaime & Gaysset, 2018).

To assess the validity of instruments, we employ the standard Hansen test of over-identification. The null hypothesis for this test is that the instrumental variables are not correlated with the residuals. In addition, the study conducts a serial correlation test, where the null hypothesis posits that there is no second-order serial correlation in the error terms. Using the Hansen test, we failed to reject the null hypothesis, indicating the validity of all instruments, as evidenced by a p-value that is greater than 0.050. Similarly, AR(1) test results for first-order correlation show that the models suffer from first-order serial correlation, with a p-value of less than 0.050. The AR (2) test results for second-order serial correlation indicate that the models are free from such correlation, with a p-value of greater than 0.050 (Abdulkarim & Ali, 2019; Md Jamil et al., 2024; Seven & Coskun, 2016).

6.5.1.5 Summary of the Results

This section summarises the key findings from the analysis of the impact of financial inclusion on income inequality (measured by the Gini coefficient). Overall, access to financial services and products, penetration of those services and the overall financial inclusion index contribute to lower-income inequality in the selected African countries. Improved availability and widespread access to financial services and products promote a fair distribution of income. However, there is a notable divergence between the effects of financial usage and those of access, penetration and the overall index. While access, penetration and the overall index help reduce income inequality, financial usage appears to worsen it. This increase in income inequality may be due to underlying factors such as lack of income, lack of documentation, and living in remote areas (African Development Bank, 2013; Tita & Aziakpono, 2017). Financial use does not reduce income inequality because these factors lead to the involuntary exclusion of marginalised groups from using the available financial services and products, resulting in the benefits of financial service usage being concentrated among already included segments of the population.

The overall financial inclusion index in equation 6.1, which is based on access, penetration and usage dimensions, reveals interesting findings. Notably, the usage dimension shows a negative effect towards the overall index, reflected by a negative eigenvalue. On the contrary, access and penetration dimensions have positive eigenvalues. This indicates that while access and penetration improve overall inclusion, usage seems to reduce it. The negative effect of usage suggests that

there are underlying factors that hinder effective usage, which hamper the goal of achieving financial inclusion for all and reducing income inequality. Consequently, promoting usage without first addressing the barriers that hinder vulnerable groups from using them may not only limit the overall effectiveness of financial inclusion initiatives but also worsen income inequality. This is because the benefits of increased financial service usage are likely to accrue disproportionately to individuals who are already financially included.

6.5.2 Impact of Financial Inclusion on Income Inequality Across Varying Levels of Income Inequality

This section aims to achieve objective five, which is to test the impact of financial inclusion on income inequality across varying levels of income inequality. This follows the analysis of linear estimation using a regression, which assumes the same effect across all levels of income inequality. It investigates whether the impact of financial inclusion on income inequality varies across the 25 African countries, as levels of income inequality differ among them. This is a question that, to the best of our knowledge, has not been fully addressed by existing studies. Equation 5.11 assumes that the impact of financial inclusion is the same at all levels of income inequality. Particularly, the two-step system GMM results do not reveal the effect of financial inclusion on income inequality at different levels of income inequality. However, the impact of financial inclusion on income inequality might differ across the lower, middle and upper quantiles of income inequality distribution (Kebede et al., 2023). Hence, it is important to investigate whether, as income inequality varies across the 25 African countries, the impact of financial inclusion on income inequality varies as well. To this end, the study employs the panel quantile regression following Demir et al. (2022) and Kebede et al. (2023).

In quantile regression, the relevance of the predictors of a model can change depending on the quantile of the dependent variable (Koenker & Bassett, 1978). This means that, in this study, the impact of financial inclusion, as a predictor variable along with other independent variables, on income inequality might differ across countries with varying levels of income inequality. This study follows the work of Demir et al. (2022) and Kebede et al. (2023) to analyse income inequality across different quantiles of 0.10, 0.25, 0.40, 0.50, 0.60, 0.75, and 0.90. In this context, lower quantiles correspond to countries with relatively lower income inequality, the median quantile

reflects moderate inequality, and higher quantiles correspond to countries with relatively higher inequality. Tables 6.16, 6.17, 6.18 and 6.19 present the results of the quantile regression for the full sample of countries in the study using financial inclusion measured by access, penetration and usage, as well as the overall financial inclusion index.

6.5.2.1 Discussion of Financial Inclusion Access Results

The results of the quantile regression show that the impact of the different measures of financial inclusion varies across the income inequality distribution in all four tables. That is, financial inclusion does not universally affect income inequality; its impact depends on a country's position in the distribution of income inequality. When we look at financial inclusion by access, it shows that at lower quantiles of income inequality distribution (i.e. 0.10 and 0.25), fi_access has a positive impact on income inequality (see Table 6.16). That is, at lower quantiles of the income distribution, fi_access increases income inequality. This outcome is significant at the 10^{th} quantile. The positive effect at lower quantiles of income inequality can be explained by capital market imperfections, as highlighted by Aghion and Bolton (1997) and Piketty (1993). In countries with low inequality, increased access to financial services does not necessarily translate into equal benefits, as differences in wealth accumulation persist. In the presence of information asymmetries and imperfect credit markets, access to financial services, especially credit, tends to favour wealthier individuals who can meet collateral and creditworthiness requirements. This unequal access enables richer individuals to invest in high-return opportunities and accumulate wealth faster than poorer individuals, worsening income inequality (Aghion & Bolton, 1997; Banerjee & Newman, 1993; Galor & Zeira, 1993).

The findings of this study contrast with those of Sukmana and Ibrahim (2018), who found that in countries with relatively low levels of inequality, increased financial access reduces inequality. These findings suggest that access to financial services and products is more effective at reducing income inequality in countries with more equal income distributions. A possible reason for the difference in findings at the low level of income inequality is the heterogeneous effects of fi_access. The overall goal of improving financial accessibility is to provide financial services and products to poorer individuals. However, a World Bank Group report (2025a) notes that in countries with low levels of income inequality, wealthier individuals are in a position to take

advantage of new financial opportunities, which can ultimately increase income inequality. This may arise from market frictions and inefficient allocation of resources, which can undermine the positive effects of the financial sector and exclude some businesses and individuals from the formal financial system (Demir et al., 2022; Girma & Huseynov, 2024). Furthermore, Claessens and Perotti (2007) revealed that political exclusion leads to unequal access to finance, resulting in disproportionate opportunities and further reinforcing income inequality.

The relationship between financial access and income inequality turns negative from medium to higher quantiles of the income inequality distribution. From the 40th to the 90th quantiles, the study finds that financial access significantly reduces income inequality in all models except model 6, which has a negative sign but is insignificant. This suggests that financial access is more effective at reducing income inequality in countries that experience medium, moderately high and extremely high income inequality. These findings are similar to those reported by Demir et al. (2022). The reason for this is that access to financial services and products provides opportunities for marginalised and low-income people to access crucial financial services, such as credit and capital, that were previously unavailable to them. This empowerment enables these individuals to build wealth, manage risk and support income-generating activities. As a result, increased financial access reduces income inequality by benefiting those at the lower end of income distribution (CGAP, 2025). Table 6.16 shows the results for the impact of financial access on income inequality at varying levels of income inequality.

Table 6. 16: Financial inclusion access and Gini coefficient

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Variables	10th	25th	40th	50th	60th	75th	90th
fi_access	0.026***	0.008	-0.022***	-0.020***	-0.016**	-0.004	-0.008*
	(0.005)	(0.006)	(0.008)	(0.007)	(0.007)	(0.004)	(0.005)
lGDPpcap	-0.015**	-0.015	0.008	0.003	-0.003	-0.005	-0.005
	(0.008)	(0.010)	(0.014)	(0.011)	(0.011)	(0.006)	(0.008)
ltrade	-0.063***	-0.018	-0.024	-0.028	-0.019	0.021	0.017
	(0.016)	(0.021)	(0.028)	(0.023)	(0.022)	(0.013)	(0.016)
lgovernment	-0.026**	-0.054***	-0.030	0.019	0.028	0.005	0.018
	(0.013)	(0.017)	(0.022)	(0.018)	(0.018)	(0.010)	(0.013)
linflation	-0.034***	-0.021	0.009	0.008	0.003	-0.003	-0.011
	(0.011)	(0.014)	(0.019)	(0.015)	(0.015)	(0.009)	(0.011)
lpopulation	-0.006	-0.007	-0.014*	-0.010	-0.012**	-0.021***	-0.023***
	(0.004)	(0.006)	(0.008)	(0.006)	(0.006)	(0.004)	(0.004)
Constant	0.051	-0.059	-0.243	-0.365*	-0.302	-0.162	-0.082

	(0.138)	(0.183)	(0.241)	(0.199)	(0.193)	(0.113)	(0.137)
Observations	425	425	425	425	425	425	425

Source: Calculated by the author on STATA 18. Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

6.5.2.2 Discussion of Financial Inclusion Penetration Results

When we examine the impact of the financial penetration dimension, the results are broadly similar to the access dimension. Table 6.17 shows that at lower quantiles (i.e. 0.10 and 0.25), fi_penetration has a positive impact on income inequality. This outcome is significant at the 10th quantile. This effect is similar to that of the access dimension, but differs from that of the usage dimension. This suggests that financial penetration is associated with higher income inequality in countries with lower levels of income inequality. These results align with the theoretical framework of capital market imperfections, where financial services may not penetrate extensively among different groups of consumers in society due to the presence of financial market imperfections, such as asymmetric information and costs of transactions (Aghion & Bolton, 1997; Galor & Zeira, 1993). Imperfections in the financial market can lead to a new type of exclusion, in which individuals are financially excluded, contributing to increased income inequality (Aghion & Bolton, 1992; Aghion & Bolton, 1997).

Similar to the findings for the access dimension, as we move from medium to higher quantiles of the income inequality distribution, the relationship between financial penetration and income inequality becomes negative, showing that penetration of financial services significantly reduces income inequality. From the 40th to the 90th quantiles, increasing penetration of financial services significantly reduces income inequality. That is, penetration of financial services and products is more effective at addressing income inequality in countries that experience medium, moderately high and extremely high income inequality. These negative findings can be explained by the theoretical framework of capital accumulation (Aghion & Bolton, 1992; Aghion & Bolton, 1997). In the presence of minimal financial market imperfections, financial services and products can reach a broader community. This enables the widespread distribution of financial services and products among different groups in society, helping them seize available investment opportunities. It also enables those with entrepreneurial skills to obtain credit to start and expand their businesses based on their abilities and the execution of business ideas, rather than their wealth (Aghion & Bolton, 1997; Demirgüç-Kunt & Levine, 2009; Tita & Aziakpono, 2017). In such contexts, as

capital becomes available to a wider share of the population, especially lower-income households, it fosters entrepreneurship, supports employment creation and productivity over time, thereby reducing the income gap between the poor and wealthy (Klapper et al., 2006; Segning et al., 2023). Table 6.17 shows the results for the impact of financial penetration on income inequality at varying levels of income inequality.

Table 6. 17: Financial inclusion penetration and Gini coefficient

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Variables	10th	25th	40th	50th	60th	75th	90th
fi_penetration	0.039***	0.009	-0.037***	-0.037***	-0.034***	-0.028***	-0.028***
	(0.006)	(0.010)	(0.009)	(0.006)	(0.006)	(0.005)	(0.004)
lGDPpcap	-0.022***	-0.012	0.018	0.016*	0.003	0.002	-0.002
	(0.008)	(0.013)	(0.012)	(0.008)	(0.009)	(0.007)	(0.006)
ltrade	-0.050***	-0.019	-0.012	-0.033*	-0.027	0.007	-0.012
	(0.018)	(0.029)	(0.027)	(0.019)	(0.020)	(0.015)	(0.013)
lgovernment	-0.020	-0.049**	-0.039*	-0.017	0.016	0.015	0.020*
	(0.014)	(0.023)	(0.021)	(0.015)	(0.016)	(0.012)	(0.011)
linflation	-0.031**	-0.021	0.017	0.018	0.010	0.001	-0.007
	(0.012)	(0.020)	(0.018)	(0.013)	(0.013)	(0.010)	(0.009)
lpopulation	-0.001	-0.007	-0.014*	-0.018***	-0.016***	-0.015***	-0.024***
	(0.005)	(0.008)	(0.007)	(0.005)	(0.005)	(0.004)	(0.004)
Constant	-0.076	-0.094	-0.375*	-0.259	-0.251	-0.320**	-0.000
	(0.150)	(0.247)	(0.228)	(0.163)	(0.165)	(0.127)	(0.112)
Observations	425	425	425	425	425	425	425

Source: Calculated by the author on STATA 18. Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

6.5.2.3 Discussion of Financial Inclusion Usage Results

When financial inclusion is measured by usage, the impact differs from the access and penetration dimensions and diverges inversely. Table 6.18 shows that at lower quantiles (i.e. 0.10 and 0.25), fi_usage has a negative impact on income inequality. This outcome is statistically significant at the 10^{th} quantile. This suggests that the use of financial services reduces income inequality at lower quantiles of the income inequality distribution. These results differ from those of access and penetration dimensions but are consistent with those reported by Kebede et al. (2023), which showed that financial usage reduces inequality in countries with low income inequality. A possible reason is that, in environments where income distribution is relatively even, financial usage allows the poor and middle class to access the credit and capital necessary to start or expand small businesses. Without access to formal financial services and the skills to use them, these individuals are often limited to informal and unregulated financial tools (CGAP, 2025). Improved usage of

financial services and products, such as credit and bank accounts, based on education and income, can create new income streams and employment. This, in turn, enhances the economic welfare of a wider segment of the population, leading to a decline in income inequality (World Bank Group, 2024a).

The relationship between financial usage and income inequality becomes positive from medium to higher quantiles of the income inequality distribution. From the 40^{th} to the 90^{th} quantiles, the study found that higher usage of financial services significantly increases income inequality. This outcome contrasts with the results related to access and penetration dimensions. It appears that financial usage exacerbates income inequality in countries experiencing medium, moderately high and extremely high-income inequality. A possible explanation is that income inequality is likely to increase if usage of financial services is limited to a few affluent people (Tita & Aziakpono, 2017). According to Marx's theory, the financial system tends to favour the economically powerful. In this context, when institutions are weak, financial resources tend to be directed towards affluent individuals who can provide collateral and repay loans, while poor people often find themselves excluded (Clark et al., 2006). In addition, most African governments continue to operate within an inherited colonial financial system that emphasises a top-down approach to urban governance. This approach fails to account for the complexities of African economies, which are mostly informal, leading cities to become centres of growth rather than national economies (Girma & Huseynov, 2024; Tita & Aziakpono, 2017). As a result, the benefits of increased financial usage are captured by individuals who are already financially included, while low-income groups remain excluded, thereby reinforcing the income disparities and contributing to the rise in income inequality observed in the analysis. Table 6.18 shows the results for the impact of financial usage on income inequality at varying levels of income inequality.

Table 6. 18: Financial inclusion usage and Gini coefficient

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Variables	10th	25th	40th	50th	60th	75th	90th
fi_usage	-0.023**	-0.001	0.033***	0.036***	0.034***	0.011*	0.020***
	(0.009)	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)	(0.004)
lGDPpcap	0.019**	-0.006	-0.009	-0.004	-0.009	-0.007	-0.004
	(0.009)	(0.008)	(0.008)	(0.008)	(0.007)	(0.006)	(0.005)
ltrade	-0.058**	-0.020	0.002	-0.014	-0.025	0.018	0.035***
	(0.026)	(0.022)	(0.021)	(0.022)	(0.020)	(0.017)	(0.013)
lgovernment	-0.014	-0.051***	-0.006	0.038**	0.062***	0.022	0.023**
	(0.023)	(0.019)	(0.019)	(0.019)	(0.018)	(0.015)	(0.011)
linflation	-0.027	-0.021	-0.018	-0.016	-0.004	-0.005	-0.014
	(0.017)	(0.014)	(0.014)	(0.014)	(0.013)	(0.011)	(0.009)
lpopulation	-0.004	-0.008	-0.003	0.002	-0.008	-0.018***	-0.017***
	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.004)
Constant	-0.322	-0.104	-0.343*	-0.498***	-0.344**	-0.237*	-0.273**
	(0.222)	(0.186)	(0.180)	(0.185)	(0.172)	(0.142)	(0.110)
Observations	425	425	425	425	425	425	425

Source: Calculated by the author on STATA 18. Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

6.5.2.4 Discussion of Financial Inclusion Index Results

After examining the impact of various dimensions, we turn to investigate the impact of the financial index. The results are similar to those found in access and penetration dimensions (see Table 6.19). At lower quantiles (i.e. 0.10 and 0.25), the overall financial inclusion index has a positive impact on income inequality. This outcome is only significant at the 10^{th} quantile. These results are contrary to those of Demir et al. (2022) and Md Jamile et al. (2024), who found that financial inclusion reduces inequality in countries at lower quantiles. The results differ due to the nature of data used, time period and the proxies. This suggests that the financial inclusion index exacerbates income inequality in countries with low inequality. The possible reason is based on the model proposed by Greenwood and Jovanovic (1990), which suggests that when the financial system is still developing, individuals encounter fixed membership costs that can prevent low-income individuals from participating in financial markets. Since poor people tend to save less and accumulate wealth at a slower rate, the disparity between high-income participants in the financial market and the low-income individuals excluded widens. This widening gap ultimately contributes to an increase in income inequality. Consequently, the initial benefits of financial inclusion tend to favour the wealthier community, who can take advantage of these benefits (Clarke et al., 2006; Greenwood & Jovanovic, 1990).

On the other hand, from the 40th to the 90th quantiles, the financial inclusion index significantly reduces income inequality. This indicates that financial inclusion is more effective in reducing income inequality in countries with medium, moderately high and extremely high levels of income inequality. These findings are similar to those found in studies conducted by Demir et al. (2022) and Kebede et al. (2023). In such contexts, financial inclusion plays a significant role in addressing income inequality by promoting innovation and entrepreneurship through the movement and availability of capital. This access to funds facilitates business start-up or expansion, employment creation and improves productivity over time (Klapper et al., 2006; Sharma, 2016). In addition, by providing access to investment opportunities regardless of generational wealth, financial inclusion enables low-income groups to engage in income-generating activities and increases economic participation. As businesses expand and create more employment opportunities with better wages, household income improves, leading to a decrease in income inequality (Tita & Aziakpono, 2017). Table 6.19 presents the results for the impact of the financial inclusion index on income inequality at varying levels of income inequality.

Table 6. 19: Financial inclusion index and Gini coefficient

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Variables	10th	25th	40th	50th	60th	75th	90th
fi_i	0.029***	0.006	-0.023***	-0.023***	-0.024***	-0.014***	-0.021***
	(0.005)	(0.007)	(0.007)	(0.006)	(0.005)	(0.004)	(0.003)
lGDPpcap	-0.019**	-0.010	0.004	0.005	0.003	-0.001	-0.001
	(0.008)	(0.012)	(0.011)	(0.009)	(0.009)	(0.007)	(0.005)
ltrade	-0.048**	-0.022	-0.018	-0.025	-0.033	0.022	0.018
	(0.020)	(0.028)	(0.027)	(0.021)	(0.021)	(0.016)	(0.012)
lgovernment	-0.040**	-0.049**	-0.020	0.018	0.040**	0.019	0.022**
	(0.016)	(0.023)	(0.021)	(0.017)	(0.017)	(0.013)	(0.010)
linflation	-0.033**	-0.021	0.006	0.010	0.004	-0.002	-0.013
	(0.013)	(0.019)	(0.018)	(0.014)	(0.014)	(0.011)	(0.008)
lpopulation	-0.004	-0.007	-0.013*	-0.011*	-0.013**	-0.016***	-0.022***
	(0.005)	(0.008)	(0.007)	(0.006)	(0.006)	(0.004)	(0.003)
Constant	0.021	-0.090	-0.267	-0.382**	-0.312*	-0.335**	-0.136
	(0.169)	(0.241)	(0.226)	(0.182)	(0.176)	(0.135)	(0.106)
Observations	425	425	425	425	425	425	425

Source: Calculated by the author on STATA 18. Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

6.5.2.5 Summary of the Results

This section summarises the key findings from the analysis of the impact of financial inclusion on income inequality across varying levels of inequality. Overall, access to financial services and products, penetration of those services, and the financial inclusion index have a similar impact on income inequality, while usage has an opposite effect. When access, penetration and the index are positive (or negative), usage of financial services and products is negative (or positive). For instance, at lower quantiles (i.e. 0.10 and 0.25), access to and penetration of financial services and products, and the overall financial inclusion index exacerbate income inequality. In contrast, usage reduces income inequality in the selected African countries. That is, promoting access, penetration, and overall financial inclusion in countries at low quantiles of the income inequality distribution has detrimental effects on income distribution, while improved usage promotes fair income distribution. In addition, from the 40^{th} to the 90^{th} quantiles, access to financial services and products, their penetration, and the overall financial inclusion index effectively reduce income inequality in countries at medium to high quantiles of the income inequality distribution. Conversely, financial usage widens the inequality gap. These findings suggest that strategies aimed at improving financial inclusion cannot be implemented in the same manner among the dimensions of access, penetration and usage. Instead, policy interventions should adopt a twin peak approach.

6.5.3 Non-linear Impact of Financial Inclusion on Income Inequality

The aim of this section of the study is to achieve objective six, which is to investigate the non-linear impact of financial inclusion on income inequality in the selected African countries. This objective is informed by existing theory, which suggests a non-linear relationship between financial inclusion and income inequality. For example, Greenwood and Jovanovic (1990) show a possible non-monotonic relationship between financial inclusion, encompassing financial services and products such as credit and capital, and income inequality. In another study, Aghion and Bolton (1997) explain that capital market imperfections, such as moral hazard in the presence of wealth constraints on borrowers, are the source of the non-linear impact and income inequalities. They argue that capital accumulation initially increases income inequality during the early stages of development. However, in later stages, it tends to reduce income inequality, producing an inverted-U-shaped relationship. Consequently, different financial services regimes can lead to varying distributional effects.

To test for a non-linear, specifically an inverted-U association between financial inclusion and income inequality, the study added a square term (i.e. c.fi_i#c.fi_i) of financial inclusion in the two-step system GMM model following Fouejieu et al. (2020) and Segning et al. (2023). The study investigates the nexus using the financial inclusion index and the Gini coefficient following Segning et al. (2023). The results in Table 6.20 are presented across 3 models that test for an inverted-U-shaped relationship between the financial inclusion index and income inequality in selected African countries. The study used various models by adding more control variables each time. This was to check whether the results would change as we increased the number of control variables and confirm the robustness of the results. In Model 1, we tested for non-linearity by controlling only for real GDP per capita and government. In Model 2, we increased the number of variables by adding trade and inflation, whereas in Model 3, we included all the control variables. The results show that, for the selected African countries, there is no inverted-U-shaped relationship between financial inclusion and income inequality during the study period. The linear term (fi_i) is negative and significant in model 2, while the square term is insignificant across all the models. The significance of the linear term suggests that financial inclusion affects income inequality in a linear manner. Table 6.20 presents the results of the effect of the financial inclusion index on income inequality, conditional on the extent of financial inclusion in 25 African countries.

Table 6. 20: The impact of the financial inclusion index on income inequality, conditional on the extent of financial inclusion

	Model 1	**Model 2**	**Model 3**
Dependent variable	lginico	lginico	lginico
L.lginico	0.995***	1.037***	1.029***
	(0.044)	(0.041)	(0.036)
fi_i	-0.001	-0.004*	-0.003
	(0.004)	(0.002)	(0.003)
c.fi_i#c.fi_i	0.001	0.000	0.000
	(0.001)	(0.000)	(0.001)
lGDPpcap	0.017	0.018***	0.016***
	(0.011)	(0.005)	(0.006)
lgovernment	0.035***	0.023***	0.032***
	(0.009)	(0.009)	(0.008)
ltrade		-0.026***	-0.021***
		(0.006)	(0.007)
linflation		0.005**	0.003*
		(0.002)	(0.002)
lpopulation	0.009***		0.004
	(0.003)		(0.002)
Constant	-0.375***	-0.093***	-0.182***

	(0.129)	(0.034)	(0.058)
Observations	400	400	400
Number of countryid	25	25	25
Instruments	14	15	16
AR(1) test	0.004	0.004	0.005
AR(2) test	0.526	0.529	0.465
Hansen test	0.804	0.673	0.744

Source: Calculated by the author on STATA 18. Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

6.6 Robustness Check Results

6.6.1 Alternative Measurement of Income Inequality

The empirical approach discussed in section 6.5.1 is based on various proxies for financial inclusion, but relies on a single measure of income inequality (the Gini coefficient). In this section, we rerun the same set of regressions using an alternative measure of income inequality, the Palma ratio, to check the sensitivity of the results to an alternative measurement of income inequality. The empirical exercise remains essentially unchanged, except for the definition of the dependent variable. There are differences in how the Gini coefficient and Palma ratio are derived. The Gini coefficient is derived from the Lorenz curve, which plots the percentage of earned income against the percentage of cumulative population (Deiniger & Squire, 1996; De Maio, 2007). In contrast, the Palma ratio captures the distribution's tails between the poorest and the richest. It primarily focuses on the distribution of income between the highest and lowest levels. Due to the difference between the measures of income inequality, the relationship between financial inclusion and income inequality can be sensitive to the two measures.

6.6.1.1 The Effect of Financial Inclusion on Income Inequality

Table 6.21 displays the results for the impact of financial inclusion on income inequality (measured by the Palma ratio). The results across models 1 to 4 are similar to those in section 6.5.1, where the Gini coefficient was the main dependent variable. The regression results based on the Palma ratio are consistent with the main findings presented in section 6.5.1 (see Table 6.15). First, the study found that the lagged dependent variable (i.e. L.lpalma) has a positive, statistically significant relationship in the selected African countries during the study period. This suggests that high levels of income inequality (lpalma) in the preceding period are a predictor of higher levels of income inequality in the present period. Second, it is found that, even when an alternative

measure of income inequality is used, financial inclusion (proxied by access, penetration, and the overall index) has a negative and statistically significant impact on income inequality, while financial usage has a positive, statistically significant effect. Concerning the control variables, lGDPpcap and lpopulation remained positive and statistically significant in models 1, 2 and 4, while trade showed a negative and statistically significant effect on income inequality in models 1, 2 and 4. Inflation is positive and statistically significant in model 1.

Table 6. 21: Financial inclusion and Palma ratio

	Model 1	**Model 2**	**Model 3**	**Model 4**
	fi_access	fi_penetration	fi_usage	fi_i
Dependent variable	lpalma	lpalma	lpalma	lpalma
L.lpalma	1.075***	1.108***	1.042***	1.094***
	(0.014)	(0.021)	(0.050)	(0.014)
fi_access	-0.010*	-	-	-
	(0.006)	-	-	-
fi_penetration	-	-0.015***	-	-
	-	(0.006)	-	-
fi_usage	-	-	0.030*	-
	-	-	(0.016)	-
fi_i	-	-	-	-0.009*
	-	-	-	(0.005)
lGDPpcap	0.033*	0.068***	0.030	0.062***
	(0.018)	(0.013)	(0.026)	(0.011)
lgovernment	0.015	-0.000	0.036	-0.002
	(0.011)	(0.008)	(0.030)	(0.008)
ltrade	-0.034**	-0.059***	-0.031	-0.048***
	(0.014)	(0.012)	(0.036)	(0.009)
linflation	0.009**	0.002	0.005	-0.002
	(0.004)	(0.004)	(0.010)	(0.005)
lpopulation	0.014***	0.019***	0.013	0.018***
	(0.005)	(0.006)	(0.009)	(0.005)
Constant	-0.531***	-0.763***	-0.490*	-0.686***
	(0.136)	(0.155)	(0.271)	(0.114)
Observations	400	400	400	400
Number of countryid	25	25	25	25
Instruments	20	24	12	24
AR(1) test[17]	0.711	0.799	0.246	0.645
AR(2) test	0.166	0.172	0.134	0.174
Hansen test	0.538	0.675	0.766	0.647

Source: Calculated by the author on STATA 18. Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

[17] While a significant AR(1) is expected, it is insignificant in this case, which may reflect the particular characteristics of the dataset, such as limited time periods. Importantly, the insignificant AR(2) confirms that there is no second-order serial correlation, supporting the validity of the estimations.

6.6.2 Controlling for Institutional Factors: Property Rights

In this section, we re-estimate the empirical model from section 6.5.1 by including institutional factors, such as property rights protection, as a control variable to assess the robustness of the results and verify whether the main findings remain unchanged after accounting for institutional influences. The literature indicates that countries with strong control of corruption, efficient government, and political stability foster economic growth, fair income distribution, and poverty reduction. Institutional factors such as the rule of law, accountability, low expropriation risk, and sound regulation are linked to lower income inequality and poverty (Tebaldi & Mohan, 2010). In contrast, weak institutions, such as weak anti-corruption controls and contract enforcement, enable those with collateral and connections to benefit more from financial services, increasing income inequality (Kebede et al., 2023). Thus, strengthening regulations is crucial for a secure, inclusive financial system (Kaufmann et al., 2010; Muriu, 2020; Nsiah & Tweneboah, 2023; World Bank, 2010). The empirical exercise remains essentially unchanged, apart from the inclusion of an additional control variable. The regression results, using property rights protection as a control variable following Kebede et al. (2023), are consistent with the main findings discussed in section 6.5.1 (see Table 6.15). First, the study found that the lagged dependent variable (i.e., L.lginico) has a positive, statistically significant relationship in the selected African countries during the study period. This suggests that high levels of income inequality (lginico) in the preceding period are a predictor of higher income inequality in the present period. Second, despite the additional control variable (lpropertyrights), financial inclusion (proxied by access, penetration, and the index) has a negative, statistically significant impact on income inequality, whereas financial usage has a positive and statistically significant effect on income inequality. Concerning the control variables, lGDPpcap and lpopulation remained positive and statistically significant across all models, while trade showed a negative, statistically significant effect on income inequality. Inflation is positive and statistically significant in models 1, 2 and 4, while lgovernment is positive and statistically significant in models 1, 3 and 4. Table 6.22 provides results on the relationship between financial inclusion and income inequality after incorporating institutional factors.

Table 6. 22: The impact of financial inclusion on income inequality, accounting for institutional factors

	Model 1	**Model 2**	**Model 3**	**Model 4**
	fi_access	fi_penetration	fi_usage	fi_i
Dependent variable	lginico	lginico	lginico	lginico
L.lginico	1.067***	1.055***	1.029***	1.070***
	(0.034)	(0.022)	(0.028)	(0.032)
fi_access	-0.004***	-	-	-
	(0.001)	-	-	-
fi_penetration	-	-0.006**	-	-
	-	(0.003)	-	-
fi_usage	-	-	0.007**	-
	-	-	(0.004)	-
fi_i	-	-	-	-0.006**
	-	-	-	(0.003)
lGDPpcap	0.018***	0.021***	0.018***	0.023***
	(0.003)	(0.005)	(0.003)	(0.006)
lgovernment	0.006*	0.005	0.007***	0.006*
	(0.003)	(0.004)	(0.003)	(0.004)
lPropertyrights	-0.005*	-0.005	-0.014***	-0.009***
	(0.003)	(0.004)	(0.003)	(0.003)
ltrade	-0.015***	-0.019***	-0.015***	-0.019***
	(0.005)	(0.006)	(0.004)	(0.006)
linflation	0.005***	0.005**	-0.001	0.004***
	(0.001)	(0.002)	(0.001)	(0.001)
lpopulation	0.002*	0.002*	0.003**	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	-0.096***	-0.110***	-0.103***	-0.120***
	(0.033)	(0.034)	(0.039)	(0.044)
Observations	400	400	400	400
Number of countryid	25	25	25	25
Instruments	24	24	24	24
AR(1) test	0.003	0.003	0.003	0.003
AR(2) test	0.879	0.868	0.648	0.780
Hansen test	0.493	0.512	0.215	0.360

Source: Calculated by the author on STATA 18. Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

6.6.3 Non-linear Impact of Financial Inclusion on Income Inequality

Table 6.23 presents the results of the effect of the financial inclusion index on income inequality, conditional on the extent of financial inclusion across 25 African countries. In this section, we rerun the empirical model from section 6.5.3 using an alternative measure of income inequality, the Palma ratio, to check the sensitivity of the results. The Palma ratio results across the three

models align with the main findings discussed in section 6.5.3, which used the Gini coefficient (see Table 6.20). There is no evidence of an inverted-U-shaped relationship between the financial inclusion index and income inequality in the selected African countries. The linear term has a negative sign but is statistically insignificant, whereas the square term is positive but statistically insignificant. Although the linear terms are insignificant in all models, this does not change the conclusion of the study because the signs are similar to those found in section 6.5.3.

Table 6. 23: The impact of the financial inclusion index on income inequality, conditional on the extent of financial inclusion

	Model 1	**Model 2**	**Model 3**
Dependent variable	lpalma	lpalma	lpalma
L.lpalma	1.044***	1.087***	1.080***
	(0.058)	(0.074)	(0.054)
fi_i	-0.005	-0.001	-0.001
	(0.007)	(0.014)	(0.010)
c.fi_i#c.fi_i	0.000	0.001	0.001
	(0.002)	(0.003)	(0.002)
lGDPpcap	0.024	0.025	0.026
	(0.021)	(0.023)	(0.016)
lgovernment	0.037	0.008	0.018
	(0.031)	(0.023)	(0.023)
ltrade		-0.062	-0.032
		(0.041)	(0.026)
linflation		0.007	0.005
		(0.012)	(0.008)
lpopulation	0.021**		0.016**
	(0.008)		(0.006)
Constant	-0.691**	-0.115	-0.506***
	(0.289)	(0.142)	(0.127)
Observations	400	400	400
Number of countryid	25	25	25
Instruments	14	13	14
AR(1) test	0.563	0.759	0.684
AR(2) test	0.146	0.132	0.154
Hansen test	0.744	0.715	0.712

Source: Calculated by the author on STATA 18. Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

6.7 Summary of the Results

The study empirically investigated the impact of financial inclusion on income inequality across 25 African countries from 2006 to 2022. First, the study constructed financial inclusion indices, namely, access, penetration and usage and the overall index that reflects the various aspects of

financial inclusion using the PCA method. Second, the study investigated the linear impact of financial inclusion using the two-step system GMM, which assumes that the effect of financial inclusion is the same across different levels of income inequality and the quantile regression, which allows the effect to vary across different levels of income inequality. The findings show that regardless of the testing technique used (i.e. two-step system GMM or quantile regression), access to financial services and products, their penetration, and the overall financial inclusion index have a similar impact on income inequality. However, usage has an opposite effect. When access, penetration and the overall index have a positive (or negative) impact, usage of financial services and products has a negative (or positive) impact. The two-step system GMM results, as set out in section 6.5.1, indicate that the lagged dependent variable (i.e. L.lginico) has a positive and statistically significant relationship in the selected African countries during the study period. This means that high income inequality in the preceding period predicts a higher level of income inequality in the present period. Particularly, if income inequality rises by one percent in the previous period, ceteris paribus, it is expected to increase by one percent in the current period. These results are consistent with the theoretical framework of intergenerational inequality (Loury, 1981) as well as the empirical research of Abdulkarim and Ali (2019) and Menyelim et al. (2021).

In addition, the impact of financial inclusion varies depending on the dimension considered. When financial inclusion is measured by access, penetration and the overall index, the results confirm the hypothesis that financial inclusion reduces income inequality. The findings indicate a negative and statistically significant impact on income inequality in the 25 African countries included. These results align with expectations and are consistent with the theory of imperfect financial markets, as well as with the transmission mechanisms of education and capital accumulation (Aghion & Bolton, 1992; Aghion & Bolton, 1997; Galor & Zeira, 1993; Klapper et al., 2006; Segning et al., 2023). An increase in financial inclusion enables more consumers to access financial services and products by reducing participation costs and improving the availability of capital. When marginalised people use this access to enhance their educational opportunities and invest in entrepreneurial activities, it leads to employment creation for disadvantaged groups and contributes to a reduction in income inequality (Klapper et al., 2006; Sarma, 2008; Sawadogo & Semedo, 2021; Segning et al., 2023).

In contrast, the study found a positive effect between financial usage and income inequality in the 25 African countries included. This suggests that increasing financial use in the presence of unequal access to financial services and products, such as limited availability of service points and the capacity to use these financial services, can result in an unequal distribution of income. This disparity arises due to a lack of income, geographical distance or a lack of knowledge (African Development Bank, 2013; Tita & Aziakpono, 2017). The robustness check results for the Palma ratio and an additional control variable, property rights protection, confirm that access to financial services and products, their penetration and the overall index reduce income inequality in the 25 African countries, whereas their use exacerbates it.

The quantile regression results in section 6.5.2 confirmed the hypothesis of the study, showing that the impact of financial inclusion on income inequality varies across the different levels of income inequality. It confirms that fi_access, fi_penetration, and fi_i have a positive and statistically significant impact on income inequality in African countries with low income inequality. However, the impact becomes negative and statistically significant in African countries with medium to high inequality. The findings suggest that increasing financial inclusion, especially in countries with relatively medium, moderately high and extremely high levels of income inequality, can reduce income inequality. In contrast, increasing financial inclusion in countries with low levels of inequality can have detrimental effects. In African countries with low levels of income inequality, fi_usage has a negative and statistically significant impact on income inequality. However, in African countries with medium to high income inequality, the effect becomes positive and statistically significant. This indicates that increasing financial usage in countries with medium, moderately high and extremely high inequality in the presence of uneven access results in an unequal distribution of income. This inequality may arise due to limited availability of service points as well as a lack of income, geographical distance or a lack of knowledge regarding the use of these financial services (African Development Bank, 2013; Tita & Aziakpono, 2017).

Third, in section 6.5.3, the study investigated the non-linear (particularly the inverted-U-shaped relationship) impact of financial inclusion on income inequality by adding a square term of financial inclusion (measured by the overall index) in the two-step system GMM model. The results of the non-linear investigation show no evidence of an inverted-U-shaped relationship

between financial inclusion and income inequality. Only the linear outcome is significant in model 2 of section 6.5.3, while the square term is insignificant across all the models when the Gini coefficient is used. The significance of the linear term suggests that although financial inclusion affects income inequality, it does so in a linear manner. When the Palma ratio is used, the results are insignificant across the models, but the signs are similar to those found when using the Gini coefficient. This implies that the results of the Palma ratio do not change the conclusion of the study. These results are consistent regardless of the income inequality measure used.

6.8 Conclusion

The main objective of this study is to investigate the impact of financial inclusion on income inequality across 25 African[18] countries during the period 2006 to 2022 using time series data. Prior to testing, the study conducted the diagnostic tests, including panel unit root, the cross-sectional dependency, time fixed effects, heteroskedasticity, multicollinearity, and serial correlation tests. These tests assisted in choosing the suitable testing techniques for the empirical analysis. First, the study constructed financial inclusion indices, namely, access, penetration and usage and the overall index that reflects the various aspects of financial inclusion using the PCA method. Second, to investigate the linear association, the study used two approaches. First, we used the two-step system GMM, which assumes that the impact is the same across all levels of income inequality. Second, we employed the panel quantile regression, which assumes that the effect varies across the varying levels of income inequality. In the models, the study included the four composed indices of financial inclusion, namely, access, penetration, usage, and the overall index. The main dependent variable analysed is the Gini coefficient, along with the Palma ratio as an alternative measure of income inequality for robustness. Additionally, the study controlled for several macroeconomic variables including GDP per capita, redistributive policies, property rights protection (for robustness check), trade, inflation and population.

The results showed that an increase in income inequality in the previous period has a positive and statistically significant impact on income inequality in the current period, all other things being equal. These findings suggest persistent income inequality, implying that factors contributing to this inequality are not temporary; rather, they have long-lasting effects. Higher income inequality

[18] See Table 6.24 with the list of African countries included in the study on page 256 of the appendices.

in one period creates conditions for continued high income inequality in future periods. In addition, despite the testing technique used (i.e., two-step system GMM or quantile regression), access to financial services and products, their penetration, and the overall financial inclusion index have a similar impact, while usage has an opposite effect. When access, penetration and the overall index have a positive effect, usage of financial services and products has a negative effect, and vice versa. In other words, improved financial inclusion, as measured by access, penetration, and the overall index, reduces income inequality, while financial usage exacerbates it in the selected African countries. Furthermore, financial inclusion, as measured by access, penetration and the overall index, has a negative impact on income inequality, especially in countries with medium, moderately high and extremely high income inequality, while it has a positive impact in countries with low income inequality. Financial usage reduces income inequality in countries with low income inequality and increases it in countries with medium to high income inequality. Lastly, the study found no evidence of an inverted-U-shaped relationship. However, only the linear term was significant, implying that the impact is primarily linear in nature.

CHAPTER 7
SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

7.1 Introduction

This chapter concludes the study, provides recommendations, and suggests potential topics for further investigation based on the findings. Section 7.2 gives a summary of the study. Section 7.3 outlines the study's key findings. The policy recommendations derived from the study are presented in section 7.4. Lastly, section 7.5 discusses the limitations of the study and identifies areas for further research.

7.2 Summary of the Study

The main objective of this study was to investigate the impact of financial inclusion on income inequality across 25 African countries from 2006 to 2022. To address the main objective, the study had six specific objectives. First, to examine the impact of financial access on income inequality in Africa. Second, to investigate the impact of financial penetration on income inequality in Africa. Third, to examine the impact of financial usage on income inequality in Africa. Fourth, to examine the effect of the composite index of financial inclusion on income inequality in Africa. Fifth, to examine whether the impact of financial inclusion on income inequality is different across countries, contingent upon their varying levels of income inequality. Sixth, to investigate the non-linear, inverted-U-shaped impact of financial inclusion on income inequality in Africa.

The significance of this study stems from the persistent and severe income inequality characterising the African region. Although Africa has demonstrated notable economic resilience, with growth reaching 3.4 percent in 2022 (United Nations Economic Commission for Africa, 2024a), such growth has largely not been inclusive or pro-poor. The region remains among the most unequal globally, with income distribution heavily skewed toward the affluent (Khan et al., 2022). This challenge has become increasingly urgent, as the African Union has recognised that extreme inequality poses a significant threat to the attainment of Agenda 2063 and has consequently set a target to reduce inequality by 15 percent over the next decade (Kamande & Hallum, 2025). Within this context, financial inclusion has been widely identified as a key mechanism for addressing inequality and promoting inclusive development (World Bank, 2013g).

A growing body of literature supports this view, suggesting that improved access to financial services and products can help narrow income disparities (Bae, Han & Sohn, 2007; World Bank, 2013b). Consequently, several African countries have adopted National Financial Inclusion Strategies (NFISs) (Demirgüç-Kunt et al*.,* 2018; Zins & Weill, 2016), often aligned with the frameworks from international organisations such as the AFI and the World Bank, to address the significant challenge (African Development Bank, 2012; Chancel et al., 2019). However, despite increased research, the relationship between financial inclusion and income inequality remains inconclusive, with mixed empirical evidence. Against this background, this study investigates the impact of financial inclusion on income inequality in Africa. To achieve this, the study is divided into several chapters, summarised below.

First, the study provided a regional literature review with two main chapters. Chapter two focused on financial inclusion in Africa, exploring the financial system, with a particular emphasis on the banking system. It noted that Africa's banking system primarily comprises central banks and deposit-taking institutions. The chapter also defined financial inclusion and distinguished between voluntary and involuntary financial exclusion. It also reviewed financial inclusion trends and highlighted the key factors perpetuating financial exclusion in the region. Chapter three focused on income inequality in Africa. This section reviewed international strategies to reduce income inequality from the UN and the World Bank. In addition, it reviewed trends in Africa's income inequality. Overall, Chapter two showed that it is more effective to consider the different dimensions of financial inclusion than to focus on individual variables to understand broader patterns. In addition, Chapter three highlighted the varying levels of income inequality within the region. This prompted the study to investigate the relationship between financial inclusion and income inequality, accounting for the various dimensions of financial inclusion and the varying levels of income inequality across the region.

Second, the study provided a comprehensive review of the theoretical and empirical literature in Chapter four. This chapter focused on the theoretical framework of financial inclusion and income inequality. It explored how financial inclusion influences income inequality through a transmission mechanism, identifying four key channels: capital accumulation, the labour market, entrepreneurial activities, and education (see Aghion & Bolton, 1997; Gine & Townsend, 2004;

Klapper et al., 2006; Sharma, 2016). In addition, the study provided empirical evidence of a positive, negative, differential, and inconclusive impact of financial inclusion on income inequality. These findings influenced the study's objectives in several ways. For instance, key insights from the theoretical review, such as the non-linear hypothesis, prompted the investigation of the non-linear association. In addition, recognising that financial inclusion is a multidimensional concept, along with the definitions from different organisations and the existing gaps in the literature, strengthened the motivation to employ the novel sub-indices (i.e., access, penetration and usage) and the overall index. This approach aimed to capture the broader impact of financial inclusion on income inequality. Furthermore, the conceptual definition of income inequality and the relevant empirical literature provided valuable insights into the different measures of income inequality, motivating the study to use multiple proxies to measure it.

Third, in Chapter five, the study discussed the various testing techniques used to analyse the relationship between financial inclusion and income inequality. This section further provides the data sources, ethical considerations, the selected dependent and independent variables, and the data, following the existing literature. Fourth, the study empirically investigated the impact of financial inclusion on income inequality in Africa from 2006 to 2022, as presented in Chapter six. It utilised various conceptual frameworks informed by theoretical and empirical specifications. Following the specification of the empirical model, the study discussed the development of composite indicators for financial inclusion using the PCA method. Instead of depending on a single indicator, the study constructed sub-indices and an overall index using various proxies. The financial inclusion indices include a total of seven proxies. The first, access dimension, uses three proxies, namely, ATMs per 100,000 adults, ATMs per 1,000 km^2, and commercial banks per 100,000 adults. Penetration is measured by the number of deposit accounts with commercial banks per 1,000 adults, and the number of commercial bank branches per 1,000 km^2. Usage uses two proxies, namely, domestic credit to the private sector as a percentage of GDP, and gross domestic savings as a percentage of GDP. The overall index was constructed using the sub-indices of access, penetration and usage.

After constructing the composite indicators of financial inclusion, the study performed summary statistics and several diagnostic tests, including tests for unit roots, cross-sectional dependence,

time fixed effects, heteroskedasticity, multicollinearity, and serial correlation. Based on these tests, the study employed the two-step system GMM estimator as a baseline model to investigate the effect of financial inclusion on income inequality in the African region. The two-step system GMM was chosen for its effectiveness in addressing endogeneity, heteroskedasticity and autocorrelation issues (Arellano & Bover, 1995; Blundell & Bond, 1998; Khan et al., 2022; Menyelim et al., 2021; Neaime & Gaysset, 2018). For the robustness check, an alternative measure of income inequality, the Palma ratio and an additional control variable, property rights protection, were used to examine the impact of financial inclusion on income inequality. In addition, the study used a panel quantile regression model to investigate the conditional effect, specifically whether the impact of financial inclusion on income inequality varies across the different levels of income inequality in the selected African countries. Furthermore, the study investigated whether the relationship between financial inclusion and income inequality exhibits a non-linear (specifically an inverted-U-shaped) correlation across the 25 African countries. For the robustness check, an alternative measure of income inequality, the Palma ratio, was used to examine the non-linear impact of financial inclusion on income inequality.

7.3 Summary of the Empirical Results

In Chapter six, the study empirically investigated the impact of financial inclusion on income inequality across 25 African countries from 2006 to 2022. It revealed notable empirical findings and contributed in several ways to the existing literature on the relationship between financial inclusion and income inequality in developing regions, with particular focus on Africa. First, it extends the literature by examining the impact of financial inclusion on income inequality using various dimensions of financial inclusion, access, penetration and usage and synthesises these into an overall financial inclusion index constructed using the PCA method. This approach captured the multidimensional nature of financial inclusion and its full impact. As shown in subsection 6.2.4, the contribution of the dimensions on overall financial inclusion differs, access to financial services and products, and their penetration, increase overall financial inclusion, whereas their usage reduces it. In subsection 6.5.1, the study demonstrated several findings regarding the relationship between financial inclusion and income inequality. When we investigated the impact of financial inclusion on income inequality, the two-step system GMM results revealed that the lagged dependent variable (i.e. L.lginico) has a positive and statistically significant relationship in

the selected African countries during the study period. This suggests that high income inequality in the previous period predicts higher levels of income inequality in the current period. Specifically, if income inequality increases by one percentage point in the previous period, ceteris paribus, it is expected to increase by one percentage point in the current period. These results align with the theoretical framework of intergenerational inequality (Loury, 1981) and with the empirical research of Abdulkarim and Ali (2019) and Menyelim et al. (2021).

In addition, the findings showed that the dimensions of financial inclusion have varying effects on income inequality. Specifically, the access and penetration dimensions confirmed the study's hypothesis, contributing to the reduction of income inequality. The results indicated a negative, statistically significant impact on income inequality in the 25 African countries analysed. These results are consistent with expected signs and theoretical expectations, particularly the education transmission mechanism and the theory of imperfect financial markets (Galor & Zeira, 1993; Klapper et al., 2006), which suggest that increased access to financial institutions and reduced participation costs foster inclusivity and reduce income inequality. Access to formal financial services and products enables people, particularly those from disadvantaged backgrounds, to invest in education and training, thus reducing income inequality (Demirgüç-Kunt & Klapper, 2012; Nkuna et al., 2018; Raihanath & Pavithran, 2014; Segning et al., 2023). Furthermore, reducing the cost of participation in the financial system encourages broader inclusion of low-income groups, which contributes to a more equal distribution of income. As financial services and products become more widely available and accessible, their penetration across different segments of society increases, further reinforcing their inequality reducing effects (Sarma, 2008; Sawadogo & Semedo, 2021). In contrast, the study found that financial usage positively influences income inequality in the 25 African countries examined. These results contradict the hypothesis of the study. This suggests that increasing financial usage (in terms of credit and savings) in the presence of uneven access due to limited availability of service points and the capacity to use these financial services can contribute to greater income disparity. Factors contributing to this inequality include insufficient income, geographical distance or a lack of knowledge (African Development Bank, 2013; Tita & Aziakpono, 2017).

The overall index showed a negative effect on income inequality, confirming the hypothesis of the study that financial inclusion reduces income inequality. These results are consistent with the capital accumulation transmission mechanism (Aghion & Bolton, 1992; Aghion & Bolton, 1997). Increasing financial inclusion enables more consumers to access financial services and products by reducing participation costs and improving the availability of capital. When marginalised people use this access to enhance their educational opportunities and invest in entrepreneurial activities, it leads to employment creation for disadvantaged groups and reduces income inequality (Klapper et al., 2006; Sarma, 2008; Sawadogo & Semedo, 2021; Segning et al., 2023). In addition, robustness checks using the Palma ratio and an additional control variable, property rights protection, confirm that access to financial services and products, their penetration, and the overall index reduce income inequality in the 25 African countries, while their use worsens it.

Second, in subsection 6.5.2, the study contributes by highlighting the differential effects of financial inclusion across countries with varying levels of income inequality, demonstrating that these effects depend on the varying levels of income inequality in the selected African countries. The quantile regression results confirmed the hypothesis of the study, showing that the impact of financial inclusion on income inequality varies across the different levels of income inequality. Specifically, access, penetration, and the overall index have a positive, statistically significant impact on income inequality in African countries at lower quantiles of the income inequality distribution. However, the impact becomes negative and statistically significant in African countries at medium to high quantiles of the income inequality distribution. The findings suggest that increasing financial inclusion reduces income inequality in countries with medium to high income inequality, but increases it in countries with low inequality.

In contrast, when we measured financial inclusion by usage, we found opposite results. In African countries at lower quantiles of the income inequality distribution, the use of financial services negatively affects income inequality. However, in African countries at medium to high quantiles, the effect becomes positive. This indicates that increased financial use (in terms of credit and savings) in countries at medium to high quantiles, in the presence of uneven access, results in an unequal distribution of income. This inequality may arise due to limited availability of service

points, insufficient income, geographic distance, or a lack of knowledge about the use of these financial services (African Development Bank, 2013; Tita & Aziakpono, 2017).

Third, in subsection 6.5.3, this thesis contributed by examining whether there is a non-linear, inverted-U-shaped relationship between financial inclusion and income inequality in the selected African countries. This analysis is informed by the theory suggesting that the movement of inequality is non-monotonic, exhibiting a non-linear association between financial inclusion and income inequality (Greenwood & Jovanovic, 1990; Townsend & Ueda, 2006). The results of the non-linear investigation showed no evidence of an inverted-U-shaped relationship between financial inclusion and income inequality, indicating that the Greenwood and Jovanovic hypothesis does not hold for the selected sample of African countries. Only the linear term is significant, while the square term is insignificant across all models using the Gini coefficient. The significance of the linear term suggests that financial inclusion affects income inequality in a linear manner. When the Palma ratio is used, the results remain insignificant across the models, but the signs are consistent with those reported in the model using the Gini coefficient. This implies that the Palma ratio results do not change the conclusion of the study. Overall, these results are consistent across the income inequality measures used.

In summary, this study provides new empirical evidence on the nuances and context-specific effects of financial inclusion on income inequality in Africa, thereby filling important gaps identified and offering insights for policymakers. The findings indicate that the dimensions of financial inclusion have different effects on income inequality. In addition, regardless of the analysis method employed (i.e. two-step system GMM, quantile regression), the specific measure of income inequality used and controlling for institutional factors, access to financial services and products, their penetration, and the overall financial inclusion index have a similar impact on income inequality. Conversely, the usage in its current form has the opposite effect. When access, penetration and the overall index have a positive impact on income inequality, usage of these financial services and products negatively impacts it, and vice versa. In addition, there is no inverted-U-shaped association observed among the 25 African countries; instead, financial inclusion has a linear effect on income inequality.

7.4 Policy Recommendations

The study drew several key policy implications for leveraging financial inclusion to reduce income inequality in Africa. The findings suggest that a nuanced approach is necessary, moving beyond simply expanding access to actively address the barriers that hinder effective usage. A primary recommendation concerns the contribution of access, penetration and usage dimensions to the overall index of financial inclusion. As shown in subsection 6.2.4, access to financial services and products, and their penetration, increase overall financial inclusion, whereas their usage reduces it. This result on financial usage suggests that although financial services may be available and widespread, certain barriers prevent individuals from effectively using them. Therefore, policymakers should prioritise policies that expand access to and penetration of formal financial services and products. At the same time, they should implement policies that address the underlying factors that hinder populations from using available services. In other words, policies aimed at promoting overall financial inclusion in Africa should first address these usage barriers. Possible interventions include promoting financial literacy and education, encouraging entrepreneurial activities to generate income and create jobs and increasing the availability of service points in remote areas (OECD, 2005; Sharma, 2016).

The results from subsection 6.5.1 show that income inequality in Africa is persistent, meaning that higher income inequality in one period tends to reinforce itself in subsequent periods. This persistence suggests that the factors contributing to inequality are not temporary, but structural and long-lasting. As a result, short-term or once-off policy interventions are unlikely to change the trajectory of income distribution in the region. Instead, addressing income inequality requires sustained and long-term strategies. Governments should therefore strengthen and continuously implement existing international and national strategies, such as those discussed in section 3.2 of this study, while adopting targeted policies that support previously disadvantaged groups and low-income earners to promote fairer distribution of income.

The results from subsection 6.5.1 indicate that access to financial services and products, their penetration and overall financial inclusion index reduce income inequality. Given these findings, policies that simultaneously enhance access to financial services and products and increase their penetration should be pursued. Policymakers should focus on developing financial systems that

accommodate the needs of poor and low-income groups by providing access to appropriate formal financial services and products. In particular, African governments should continue promoting the ownership of formal bank accounts, as this can facilitate participation in productive economic activities and help narrow the income gap between the wealthy and the poor. This may involve expanding the availability and accessibility of credit for low-income households, enabling them to increase their income, engage in productive activities, and manage their consumption during unexpected financial shocks (Chinnakum, 2023). In addition, policy and legal reforms should be targeted at reducing the costs and risks of reaching unbanked and underserved populations. Financial institutions could support these efforts by simplifying financial products, making them more relevant to lower-income users, relaxing collateral requirements and conducting advertising campaigns to reach these populations (Ali et al., 2021).

The results of the conditional effect in subsection 6.5.2 show that financial inclusion (measured by access, penetration and overall index) reduces income inequality in countries at medium to high quantiles of the income inequality distribution, but increases it in countries at lower quantiles. This finding suggests that policy recommendations should be tailored to each context. In countries that already experience a relatively fair distribution of income, such as those in Northern Africa, further expansion of financial inclusion may unintentionally worsen income inequality. Although financial inclusion may benefit other aspects of the economy, its effect on income distribution in these countries may be detrimental. Policymakers should complement financial inclusion efforts with measures that address wealth gaps, such as improving access to collateral (for example, land or property rights), supporting asset accumulation (through employment creation) for low-income households and promoting inclusive credit policies, so that low-income groups can benefit from financial inclusion. Conversely, in countries at medium to high quantiles of the income inequality distribution, particularly in Southern, Central, Western and East Africa, improving financial inclusion can play a transformative role in reducing income inequality. Governments in these regions should build on the international and national strategies discussed in section 2.3 of this study and design targeted policies to support financially excluded groups, including small businesses, low-income earners, youth and women, and populations living in remote areas. Countries that already have NFIS should reinforce the measures outlined in them, while those

without such frameworks should collaborate with countries that have begun implementing the NFIS to learn from their experiences and initiate their own strategies.

Conversely, the same analysis in subsections 6.5.1 and 6.5.2 indicates that the use of financial services and products increases income inequality, especially among countries at medium to high quantiles of the income inequality distribution. Given these findings, this suggests that the current nature of financial usage, particularly in terms of credit and savings, tends to exacerbate rather than reduce income inequality. When barriers such as low wealth, lack of income, geographic distance or inadequate financial literacy exist, encouraging financial use, particularly in terms of credit and savings, will not achieve the desired effects on income inequality. Instead, it will worsen income inequality, as financial expansion primarily benefits those with financial means and are already financially included, while disadvantaged groups remain involuntarily excluded and unable to benefit from available financial opportunities. Policymakers should implement policies that promote income-generating activities and improve the earning capacity of disadvantaged populations before promoting this form of financial use. In addition, the study recommends that policymakers in the sampled countries promote alternative forms of financial use that are more accessible to underserved populations. These may include mobile financial services such as digital payment systems and internet banking. According to the World Bank (2026), such digital financial mechanisms can help address persistent barriers to financial access and use for small businesses, low-income earners, and previously underserved individuals. Furthermore, policymakers should promote financial education initiatives to enable poor people to use these digital financial services and products effectively. Lastly, policymakers should pursue regulatory reforms that strengthen property rights. Such reforms create conditions that encourage economic growth and equal distribution of income (Tebaldi & Mohan, 2010). Overall, removing barriers to financial use in terms of credit and savings, promoting alternative forms of financial use that are more accessible to underserved populations, strengthening institutions, and fostering job creation are essential strategies for fostering inclusive financial systems. Together, these measures can promote inclusive economic growth and support the achievement of SDG 10, which aims to lower inequality within and among countries.

In countries at lower quantiles, the use of financial services and products reduces income inequality. In Northern Africa, where inequality is the lowest on the continent, the marginal effect of financial inclusion shifts from simple access to active utilisation. This can be attributed to the rise of the middle class, which has contributed to growth in real GDP per capita (Ncube et al., 2013). As household incomes improve, more people in this region gain the financial capacity to access and effectively use available financial services and products, reinforcing and sustaining the reduction in income inequality. To build on this progress, countries with relatively low inequality levels should prioritise policies that promote continued job creation, especially for small businesses and previously disadvantaged groups, thereby strengthening their capacity to use available financial services and further reducing income inequality.

7.5 Limitations of the Study and Suggested Future Research Areas

The limitations of the study stem from the lack of availability of data on financial inclusion across the African region. The study's period and the sample size are determined by this data availability. Despite the study's efforts to source relevant data from various sources, the limited data on financial inclusion indicators restricted the dimensions of financial inclusion that could be studied and the proxies that could be used. Consequently, only 25 out of 54 African countries were included in the study, covering the period from 2006 to 2022. Future research could extend the study's timeline, provided more data becomes available. It may also include additional countries and explore a wide range of indicators to measure the dimensions of financial inclusion, and researchers might consider adding other aspects, such as the cost of financial services and products. Additionally, given the wealth of theoretical perspectives suggesting a potential bidirectional relationship between financial inclusion and income inequality, future research could explore the possibility of a bidirectional Granger causality between these variables. Examining the direction of causality would provide deeper insights into whether financial inclusion drives changes in income inequality or whether existing inequality levels influence the development of financial inclusion. Such analysis would contribute to a more comprehensive understanding of the dynamic interplay between these variables.

Note: This thesis was edited using Grammarly, which is available through the University of South Africa (UNISA) subscription.

Reference List

Abdulkarim, F.M. & Ali, H.S. 2019. Financial inclusions, financial stability, and income inequality in OIC countries: A GMM and quantile regression application. *Journal of Islamic Monetary Economics and Finance*, 5(2): 419-438.

Abokyi, A. 2023. Effects of remittances on financial inclusion gender gap in developing countries. *Research in Economics*, 77(1): 1-24.

Acemoglu, D. 1998. Why do new technologies complement skills? Directed technical change and wage inequality. *Quarterly Journal of Economics*, 113(4): 1055-89.

Africa Development Bank. 2012. *Briefing notes for AFDB long term strategy.* Briefing note 5: income inequality in Africa. Available at: https://www.afdb.org/fileadmin/uploads/afdb/documents/policy-documents/final%20briefing%20note%205%20income%20inequality%20in%20africa.pdf [Accessed: 21 July 2023].

African Development Bank. 2013. *Financial inclusion in Africa.* African Development Bank staff. Available at: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Financial_Inclusion_in_Africa.pdf [Accessed: 21 July 2023].

Agence Ecofin. 2021. "Centrafrique: la conformité du secteur bancaire au dispositif prudentiel s'est dégradée entre avril 2021 et 2023". Available at: https://www.agenceecofin.com/finance/0904-117736-centrafrique-la-conformite-du-secteur-bancaire-au-dispositif-prudentiel-s-est-degradee-entre-avril-2021-et-2023 [Accessed: 12 March 2025].

Aghion, P. & Bolton, P. 1992. An incomplete contracts approach to financial contracting. *Review of Economic Studies*, 59(3): 473-494.

Aghion, P. & Bolton, P. 1997. A theory of trickle-down growth and development. *The Review of Economic Studies*, 64(2): 151-172. Available at: https://doi.org/10.2307/2971707 [Accessed: 20 May 2023].

Aghion, P., Howitt, P., & Mayer-Foulkes, D. 2005. The effect of financial development on convergence: Theory and evidence. *The Quarterly Journal of Economics*, 120(1): 173-222.

Agyemang-Badu, A.A., Agyei, K. & Duah, E.K. 2018. Financial inclusion, poverty and income inequality: Evidence from Africa. *Spiritan International Journal of Poverty Studies*, 2(2): 1-19.

Ahlburg, D.A. 1996. *Population Growth and Poverty*. In: Ahlburg, D.A., Kelley, A.C. & Mason, K.O. (Eds.). *The Impact of Population Growth on Well-being in Developing Countries. Population Economics.* Springer, Berlin, Heidelberg. Available at: https://doi.org/10.1007/978-3-662-03239-8_7 [Accessed: 9 December 2024].

Aiyar, S. & Ebeke, C. 2019. *Inequality of opportunity, inequality of income and economic growth*. International Monetary Fund Working Paper 19/34.

Allen, F., Otchere, I. & Senbet, L.W. 2011. African financial systems: A review. *Review of Development Finance*, 1(2): 79-113.

Allen, D.E., Singh, A.K., Powell, R.J. & Kramadibrata, A. 2012. Chapter 33 – *Short selling stock indices on signals from implied volatility index changes: Evidence from quantile regression-based techniques.* Academic Press, 479-492.

Alesina, A. & Perotti, R. 1996. Income distribution, political instability, and investment. *European Economic Review*, 40(6): 1203-1228.

Alesina, A. & Rodrik, D. 1994. Distributive politics and economic growth. Quarterly *Journal of Economics*, 109(2): 465-490.

Ali, J., Khan, M.S., Wadood, M. & Khan, U.S. 2021. Revisiting financial inclusion and income inequality nexus: Evidences from selected economies in Asia. *Journal of Asian Finance, Economics and Business*, 8(12): 0019-0029.

Alliance for Financial Inclusion. 2010. *Financial inclusion measurement for regulators: Survey design and implementation*. Available at: http://www.afi-global.org/news/2010/3/08/afi-policy-paper-financialinclusion-measurement-regulators-survey-design-and [Accessed: 21 July 2025].

Alliance for Financial Inclusion. 2013. *Measuring financial inclusion: Core set of financial inclusion indicators*. Available at: https://www.afi-global.org/wp-content/uploads/publications/fidwg-core-set-measuring-fi.pdf [Accessed: 26 March 2023].

Alliance for Financial Inclusion. 2015. *National financial inclusion strategies: Current state of practice*. Available at: https://www.afi-global.org/sites/default/files/publications/fisplg-state_of_practice.pdf [Accessed: 12 August 2024].

Alliance for Financial Inclusion. 2018a. *National financial inclusion strategy: Current state of practice*. Available at: https://www.afi-global.org/wp-content/uploads/publications/2018-06/National%20Financial%20Inclusion%20Strategies.pdf [Accessed: 19 August 2024].

Alliance for Financial Inclusion. 2018b. *Sochi Accord: FinTech for financial inclusion*. Available at: https://www.afi-global.org/wp-content/uploads/publications/2019-02/Sochi_FS18_AW_06.09.18_digital-compressed.pdf [Accessed: 26 August 2024].

Alliance for Financial Inclusion. 2019a. *Denarau Action Plan: Gender inclusive finance*. Available at: https://www.afi-global.org/wp-content/uploads/2018/07/Denarau_FS19_AW_digital.pdf [Accessed: 26 August 2024].

Alliance for Financial Inclusion. 2019b. *Maya Declaration: Sasana Accord*. Available at: https://www.afi-global.org/wp-content/uploads/2020/08/Sasana_FS_19_AW_digital.pdf [Accessed: 26 August 2024].

Alliance for Financial Inclusion. 2019c. *Sharm El Sheikh Accord: inclusive green finance*. Available at: https://www.afi-global.org/wp-content/uploads/2020/08/Sharm_FS_19_AW_digital.pdf [Accessed: 26 August 2024].

Alliance For Financial Inclusion. 2019d. *Alliance for Financial Inclusion Policy model: AFI core set of financial inclusion indicators*. Available at: https://www.afi-global.org/sites/default/files/publications/2019-12/AFI_PM_Core%20Set_FINAL_digital.pdf [Accessed: 26 March 2024].

Alliance for Financial Inclusion. 2020. *Kigali statement: Advancing financial inclusion for underprivileged groups*. Available at: https://www.afi-global.org/wp-content/uploads/2019/09/Kigali_FS_20_AW2_digital.pdf [Accessed: 26 August 2024].

Alliance for Financial Inclusion. 2021. *Maputo Accord*. Available at: https://www.afi-global.org/wp-content/uploads/2021/09/Maputo_Accord_21_FINAL.pdf [Accessed: 26 August 2024].

Alliance for Financial Inclusion. 2022. *National financial inclusion strategies: Current state of practice (2022)*. Available at: https://www.afi-global.org/publications/national-financial-inclusion-strategies-current-state-of-practice-2022/#:~:text=A%20well%2Dcoordinated%20national%20financial,NFIS%20and%20financial%20inclusion%20policies [Accessed: 14 August 2024].

Alliance for Financial Inclusion. 2023. *Maya Declaration progress report: Progress for shared prosperity*. Available at: https://www.afi-global.org/wp-content/uploads/2023/09/AFI_Maya-Annual-Report_2023.pdf [Accessed: 19 August 2024].

Alliance for Financial Inclusion. 2024a. *About AFI*. Available at: https://www.afi-global.org/about/#:~:text=The%20Alliance%20For%20Financial%20Inclusion,the%20lives%20of%20the%20poor [Accessed: 13 August 2024].

Alliance for Financial Inclusion. 2024b. *Smart goals, smart policies*. Available at: https://www.afi-global.org/accord/ [Accessed: 14 August 2024].

Alliance for Financial Inclusion. 2024c. *African Financial Inclusion Policy Initiative (AFPI)*. Available at: https://www.afi-global.org/activities/regional-initiatives/african-financial-inclusion-policy-initiative-afpi/ [Accessed: 26 August 2024].

AlTi Tiedemann Global. 2025. *AlTi global social progress index methodology report*. Available at: https://www.socialprogress.org/alti-global-social-progress-index [Accessed: 23 May 2025].

Altunbaş, Y. & Thornton, J. 2019. The impact of financial development on income inequality: A quantile regression approach. *Economics Letters*, 175(2019): 51-56.

Aluko, O.A. & Ajayi, M.A. 2018. Determinants of banking sector development: Evidence from Sub-Saharan African countries. *Borsa Istanbul Review*, 18(2): 122-139.

Álvarez-Gamboa, J., Cabrera-Barona, P. & J´acome-Estrella, H. 2021. Financial inclusion and multidimensional poverty in Ecuador: A spatial approach. *World Development Perspectives,* 22(2021): 1-10.

Ameta, D. & El-Shafie, H. 2015. Social protection and safety nets in Egypt. Available at: https://www.ids.ac.uk/download.php?file=files/dmfile/SocialprotectionandsafetynetsinEgypt.pdf [Accessed: 30 December 2024].

Amidžić, G., Massara, A. & Mialou, A. 2014. Assessing countries' financial inclusion standing—A new composite index. Available at: https://www.imf.org/external/pubs/ft/wp/2014/wp1436.pdf [Accessed: 26 March 2023].

Ang, J. 2010. Finance and inequality: the case of India. *Southern Economic Journal*, 76(3): 738-761.

Angeles, L. 2007. Income inequality and colonialism. *European Economic Review*, 51(5): 1155-1176.

Arellano, M. & Bover, O. 1995. Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1995): 29-51. Available at: https://doi.org/10.1016/0304-4076(94)01642-D [Accessed: 30 June 2025].

Arora, R.U. 2010. *Measuring financial access*. Griffith Research Online Working Paper No 2010-07. Available at: http://hdl.handle.net/10072/390305 [Accessed: 26 March 2024].

Associação Angolana de Bancos. 2025. "Dados das Instituições Bancárias". Available at: https://abanc.ao/instituicoes-bancarias-autorizadas/ [Accessed: 6 March 2025].

Association Professionnelle des Établissements de Crédit du Gabon. 2024. "Les établissements membres de l'APEC Gabon". Available at: https://www.apecgabon.com/etablissements-membres/ [12 March 2025].

Ashenafi, B.B. & Yan, D. 2023. Financial intermediation, inclusion, fintech, and income inequality in Africa: Robust evidence from the supply and demand side data. *Economic Notes*, 52(3): 1-28.

Aslan, G., Deléchat, C., Newiak, M. & Yang, F. 2017. *Inequality in financial inclusion and income inequality*. International Monetary Fund Working Paper, WP/17/236.

Atkinson, A.B. 1970. On the measurement of inequality. *Journal of Economic Theory*, 2(3): 244-263.

Atkinson, A.B. & Bourguignon, F. (Eds.). 2015. *Handbook of Income Distribution Volume 2*. North-Holland (Elsevier).

Atkinson, A. & Messy, F-A. 2013. *Promoting financial inclusion through financial education: OECD/INFE evidence, policies and practice*. OECD Working Papers on Finance, Insurance and Private Pensions No. 34. Available at: https://dx.doi.org/10.1787/5k3xz6m88smp-en [Accessed: 30 July 2024].

Australian Government of Foreign Trade Affairs. 2022. *List of developing countries as declared by the Minister for Foreign Affairs*. Available at: https://www.dfat.gov.au/sites/default/files/list-developing-countries.pdf [Accessed: 20 March 2025].

AZA Finance. 2025. *Mobile money payments in Africa*. Available at: https://azafinance.com/mobile-money-payments-in-africa/ [Accessed: 17 February 2025].

Azim, M.N. 2022. Assessing the effects of financial inclusion on reducing poverty and income inequality in South Asia: Evidence from a CS-ARDL approach. *Global Business Review*. doi: https://doi.org/10.1177/09721509221135927 [Accessed: 22 December 2023].

Bae, K., Han, D. & Sohn, H. 2007. Importance of access to finance in reducing income inequality and poverty level. *International Review of Public Administration*, 7(1): 55-77.

Banco de Moçambique. 2021. "Relação das Instituições de Crédito e Sociedades Financeiras 31 de Maio de 2021". Available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.bancomoc.mz%2Fmedia%2Fe5vjubbx%2Frela%25C3%25A7%25C3%25A3o_das_icsf_agosto_de_2021-1.xls&wdOrigin=BROWSELINK [Accessed: 7 March 2025].

Banerjee, A. & Newman, A. 1993. Occupational choice and the process of development. *Journal of Political Economy*, 101(2): 274-298.

Bank of Algeria. 2022. "Banques commerciales". Available at: https://www.bank-of-algeria.dz/banques-commerciales-2/ [Accessed: 6 March 2025].

Bank of Cape Verde. 2019. "Instituições Autorizadas". Available at: https://www.bcv.cv/pt/Supervisao/Institui%C3%A7%C3%B5es%20Financeiras%20Supervisionadas/Enderecos%20dos%20Bancos/Paginas/EnderecosFAQs.aspx [Accessed: 12 March 2025].

Bank of Mauritius. 2016. *List of Licensees Banks*. Available at: https://www.bom.mu/financial-stability/supervision/licensees/list-of-licensees [Accessed: 5 March 2025].

Bank of Morocco. 2019. "Liste des établissements de crédit et organismes assimilés arrêtée au 31 décembre 2019" [Accessed: 7 March 2025].

Bank of Namibia. 2013. *Social Safety Nets in Namibia: Assessing current programmes and future options*. 15th Annual Symposium. Available at:

https://www.bon.com.na/CMSTemplates/Bon/Files/bon.com.na/0f/0fa7f5ba-5585-4471-9511-1a42811bd0d1.pdf [Accessed: 29 December 2024].

Banque Centrale des Comores. 2022. "Etablissements de crédit". Available at: https://banque-comores.km/page/show/etablissements-de-credit [Accessed: 12 March 2025].

Banque Centrale de Djibouti. 2025. "Liste des institutions financières en activité et agréées par la Banque Centrale de Djibouti". Available at: https://banque-centrale.dj/les-etablissements-agrees/ [Accessed: 12 March 2025].

Banque Centrale de Mauritanie. 2025. "Structure du système bancaire". Available at: https://www.bcm.mr/-structure-du-systeme-bancaire- [Accessed: 5 March 2025].

Banque Centrale de la République de Guinée. 2023. "Liste et coordonnées des banques agréées en République de Guinée". Available at: https://www.bcrg-guinee.org/wp-content/uploads/2023/03/BANQUES-AGREEES.pdf [Accessed: 11 March 2025].

Bank of Botswana. 2025. "List of Licensed Commercial Banks In Botswana". Available at: https://www.bankofbotswana.bw/content/banks-0 [Accessed: 6 March 2025].

Bank of Ghana. 2025. "Banks". Available at: https://www.bog.gov.gh/supervision-regulation/registered-institutions/banks/ [Accessed: 11 March 2025].

Bank of Namibia. 2025. "The Banking System in Namibia". Available at: https://www.bon.com.na/Bank/Banking-Supervision/The-Banking-System-in-Namibia.aspx [Accessed: 13 March 2025].

Bank of Sierra Leone. 2025. "Commercial Banks In Sierra Leone". Available at: https://bsl.gov.sl/COMMERCIAL%20BANKS.pdf [Accessed: 5 March 2025].

Bank of South Sudan. 2025. *"List of Banks"*. Available at: https://boss.gov.ss/list-of-banks/ [Accessed: 12 March 2025].

Bank of the Republic of Burundi. 2025. *"Secteur bancaire"*. Available at: https://www.brb.bi/node/119 [Accessed: 6 March 2025].

Bank of the Republic of Congo. 2021. *Liste des banques*. Available at: https://liziba.cg/wp-content/uploads/2021/05/LISTE-DES-BANQUE.pdf [Accessed: 10 March 2025].

Bank of Tanzania. 2025. "List of Licensed Institutions". Available at: https://www.bot.go.tz/BankSupervision/Institutions [Accessed: 13 March 2025].

Bank of Uganda. 2023. *"Licensed Commercial Banks as at March 31, 2023"*. Available at: https://bou.or.ug/bouwebsite/bouwebsitecontent/Supervision/Supervised_Institutions/Supervision/financial_institutions/2023/LICENSED-COMMERCIAL-BANKS-AS-AT-MARCH-31-2023.pdf [Accessed: 12 March 2025].

Bank of Zambia. 2024. *Registered Banks*. "Registered commercial banks". Available at: https://www.boz.zm/Registered_Banks_May_2024.pdf [Accessed: 11 March 2025].

Batuo, E.M., Kararach, G. & Malki, I. 2021. *Inequality and the role of macroeconomic and institutional forces in Africa*. African Development Group, Working Paper Series No 353. Available at: file:///C:/Users/khole/Downloads/wps_no_353_inequality_and_the_role_of_macroeconomic_and_institutional_forces_in_africa_f.pdf [Accessed: 6 September 2024].

Beck, T., Cull, R. & Valenzuela, P. 2019. *Banking in Africa: An Update*, in A.N. Berger, P. Molyneux and J.O.S. Wilson (Eds.), *Oxford Handbook of Banking,* 3rd Edition, (Oxford: Oxford University Press).

Beck, T., Cull, R., Mare, S.D. & Valenzuela, P. 2023. *Banking in Africa: Opportunities and challenges in volatile times*. Policy Research Working Paper 10632. World Bank Group.

Beck, T., Demirgüç-Kunt, A., & Levine, R. 2004. *Finance, inequality, and poverty: Cross-country evidence*. The World Bank.

Beck, T., Demirgüç-Kunt, A. & Levine, R. 2007. Finance, inequality and the poor. *Journal of Economic Growth*, 12(1): 27-49.

Beck, T., Demirgüç- Kunt, A. & Martinez Peria, S.M. 2007. Reaching out: Access to and use of banking services across countries. *Journal of Financial Economics*, 85(1): 234-266.

Beck, T., Demirgüç¸-Kunt, A. & Honohan, P. 2009. *Access to Financial Services: Measurement, impact, and policies*. World Bank Document, 76787.

Beck, T., Maimbo, S.M., Faye, I. & Triki, T. 2011. *Financing Africa: Through the crisis and beyond*. Washington, DC: The World Bank. Available at: https://www.worldFigbank.org/en/programs/africa-regional-studies/publication/financing-africa-through-the-crisis-and-beyond [Accessed: 31 May 2024].

Bellù, L.G. & Liberati, P. 2006a. *Describing income inequality: Theil index and entropy class indexes*. Food and Agriculture Organization of the United Nations.

Bellù, L.G. & Liberati, P. 2006b. *Policy impacts on inequality: Welfare based measures of inequality – The Atkinson index*. Food and Agriculture Organization of the United Nations.

Bhorat, H., Naidoo, K. & Pillay, K. 2016. *Growth, poverty and inequality interactions in Africa: An overview of key issues*. Working Paper Series 1. United Nations Development Programme. Regional Bureau for Africa (RBA): Inequality Project. Available at: https://www.undp.org/sites/g/files/zskgke326/files/migration/africa/bd8f368b0fafeabda8b3ada30b65e4e4ff2fb7ee70d535ea233e8224df67e96f.pdf [Accessed: 10 September 2024].

Bicabaa, Z., Brixiová, Z. & Ncube, M. 2017. Can extreme poverty in Sub-Saharan Africa be eliminated by 2030? *Journal of African Development*, 19(2): 93-110.

Biørn, E. 2016. *Econometrics of panel data: Methods and applications*. Oxford University Press. Available at: https://doi.org/10.1093/acprof:oso/9780198753445.001.0001 [Accessed 17 April 2024].

Blundell, R. & Bond, S. 1998. Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1): 115-143. Available at: https://doi.org/10.1016/S0304-4076(98)00009-8 [Accessed: 30 June 2025].

Breit, W. 1964. Is capital accumulation compatible with economic progress and stability? *The American Journal of Economics and Sociology*, 23(2): 197-212.

Brue, S.L. & Grant, R.R. 2013. *The evolution of economic thought*. 8th international edition. South-Western: Cengage Learning.

Card, D. & DiNardo, J.E. 2002. Skill-Biased Technological Change and Rising Wage Inequality: Some Problems and Puzzles. *Journal of Labor Economics*, 20(4): 733-783.

Cámara, N. & Tuesta, D. 2014. *Measuring financial inclusion: A multidimensional index*. BBVA research. Working Paper, No 14/26.

Carvalho, L. & Rezai, A. 2014. *Personal Income Inequality and Aggregate Demand*. Working Paper Series No. 2014-23, (Sao Paulo: University of Sao Paulo FEA-USP).

Central Bank of Egypt. 2025. "Banks Registered with the Central Bank of Egypt". Available at: https://www.cbe.org.eg/en/ [Accessed: 12 March 2025].

Central Bank of Eswatini. 2025. *Commercial banks in Eswatini*. Available at: https://www.centralbank.org.sz/bank-supervision/ [Accessed: 12 March 2025].

Central Bank of Ireland. 2024. *What is financial regulation and why does it matter?* Available at: https://www.centralbank.ie/consumer-hub/explainers/what-is-financial-regulation-and-why-does-it-matter#:~:text=Poorly%20regulated%20financial%20institutions%20have,the%20prospects%20for%20the%20economy [Accessed: 27 March 2024].

Central Bank of Kenya. 2023. *"Directory of Licensed Commercial Banks, Mortgage Finance Institutions and Authorised Non-operating Holding Companies"*. Available at: https://www.centralbank.go.ke/wp-content/uploads/2023/06/Directory-of-Licenced-Commercial-Banks-Authorised-NOHCs-June-2023.pdf [Accessed: 13 March 2025].

Central Bank of Lesotho. 2024. *"List of Licensed Financial Institutions as at 29th July, 2024"*. Available at:

https://www.centralbank.org.ls/images/Public_Awareness/LFI_Double_Spread_Newspaper_Insert_Jul_2024_1.pdf [Accessed: 13 March 2025].

Central Bank of Nigeria. 2024. *"Financial Institutions"*. Available at: https://www.cbn.gov.ng/supervision/finstitutions.html [Accessed: 12 March 2025].

Central Bank of Seychelles. 2019.*"List of Commercial Banks"*. Available at: https://www.cbs.sc/Financial/CommercialBanks.html [Accessed: 13 March 2025].

Central Bank of Somalia. 2021. *"Licensed banks"*. Available at: https://centralbank.gov.so/licensed-banks/ [Accessed: 12 March 2025].

Central Bank of the Congo. 2025. *"List of Licensed Banks in the Democratic Republic of the Congo"*. Available at: https://www-bcc-cd.translate.goog/surveillance-des-intermediaires-financiers/intermediaires-financiers-assujettis/etablissements-de-credit/banques-agreees?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en&_x_tr_pto=sc [Accessed: 12 March 2025].

Central Bank of the Gambia. 2025. *"Commercial Bank"*. Available at: https://www.cbg.gm/list-of-licensed-banks [Accessed: 11 March 2025].

Chakrabarti, A. 2000. Does trade cause inequality? *Journal of Economic Development*, 25(2): 1-21.

Chakraborty, R. & Abraham, R. 2021. The impact of financial inclusion on economic development: the mediating roles of gross savings, social empowerment and economic empowerment. *International Journal of Social Economics*, 48(6): 878-897.

Chakravarty, S.R. & Pal, R. 2013. Financial inclusion in India: An axiomatic approach. *Journal of Policy Modelling*, 35(5): 813-837. doi: 10.1016/j.jpolmod.2012.12.007 [Accessed: 11 September 2023].

Chancel, L., Cogneau, D., Gethin, A. & Myczkowski, A. 2019. *Income inequality in Africa, 1990-2017*. World Inequality Database, World Issue Brief 2019/6. Available at: https://wid.world/document/income-inequality-in-africa-1990-2017-wid-world-issue-brief-2019-06/ [Accessed: 21 July 2023].

Chinnakum, W. 2023. Impacts of financial inclusion on poverty and income inequality in developing Asia. *The Singapore Economic Review*, 68(04): 1375-1391.

Chinoda, T. & Mashamba, T. 2021. Fintech, financial inclusion, and income inequality nexus in Africa. *Cogent Economics and Finance*, 9(1): 1-16. doi: 10.1080/23322039.2021.1986926 [Accessed: 10 April 2022].

Choi, I. 2001. Unit root tests for panel data. *Journal of International Money and Finance*, 20(2): 249-272.

Christopoulos, D.K. & Tsionas, E.G. 2004. Financial development and economic growth: evidence from panel unit root and cointegration tests. *Journal of Development Economics*, 73(1): 55-74.

Chironga, M., De Grandis, H. & Zouaoui, Y. 2017. Mobile financial services in Africa: Winning the battle for the customer. Available at: https://www.mckinsey.com/~/media/McKinsey/Industries/Financial Services/Our Insights/Mobile financial services in Africa Winning the battle for the customer/Mobile-financial-services-in-Africa-Winning-the-battle-for-the-customer.pdf [Accessed: 17 February 2025].

Chu-Khanh, L. & Chu, H. 2018. Effect of financial inclusion on income inequality: Evidence from cross-country analysis*,* (December 2018): 1-17. doi: 10.2139/ssrn.3308044 [Accessed: 11 April 2022].

Claessens, S. & Perotti, E. 2007. Finance and inequality: Channels and evidence. *Journal of Comparative Economics*, 5(4): 748-773.

Clarke, G., Xu, L.C. & Zou, H. 2003. *Finance and income inequality: Test of alternative theories*. World Bank Policy Research Working Paper, Washington, DC.

Clarke, G.R., Xu, L.C. & Zou, H.F. 2006. Finance and income inequality: What do the data tell us? *Southern Economic Journal*, 72(3): 578-596.

Clements, B., de Mooij, R., Gupta, S. & Keen, M. 2015. Chapter 1. *Fiscal Policy and Income Inequality: An Overview*. International Monetary Fund. Available at: https://doi.org/10.5089/9781513567754.071 Accessed: 5 May 2026].

Cobham, A. & Sumner, A. 2013. *Is it all about the tails? The Palma measure of income inequality*. Working paper 343. Center for Global Development: 1-42.

Cobham, A., Schlogl, L. & Sumner, A. 2015. *Inequality and the tails: The Palma proposition and ratio revisited*. Department of Economic & Social Affairs, Working Paper No. 143. ST/ESA/2015/DWP/143.

Cohen, L., Manion, L. & Morrison, K. 2000. *Research methods in education*. London: Routledge Falmer.

Commercial Bank of Liberia. 2025. *"Commercial Banks of Liberia Information"*. Available at: https://www.cbl.org.lr/general/commercial-banks-liberia-information [Accessed: 13 March 2025].

Commission Bancaire de l'UMOA_Benin. 2024. *"Établissements assujettis au contrôle de la Commission Bancaire de l'UMOA"*. Available at: https://cb-umoa.org/fr/etablissements-assujettis-au-controle-de-la-commission-bancaire-de-lumoa [Accessed: 6 March 2025].

Commission Bancaire de l'UMOA_Burkina Faso. 2025. *"Établissements assujettis au contrôle de la Commission Bancaire de l'UMOA"*. Available at: https://cb-umoa.org/fr/etablissements-assujettis-au-controle-de-la-commission-bancaire-de-lumoa [Accessed: 6 March 2025].

Commission Bancaire de l'UMOA_Guinea-Bissau. 2025. *"Établissements assujettis au contrôle de la Commission Bancaire de l'UMOA"*. Available at: https://cb-umoa.org/fr/etablissements-assujettis-au-controle-de-la-commission-bancaire-de-lumoa [Accessed: 12 March 2025].

Commission Bancaire de l'UMOA_Mali. 2024. Available at: https://cb-umoa.org/fr/etablissements-assujettis-au-controle-de-la-commission-bancaire-de-lumoa [Accessed: 6 March 2025].

Commission Bancaire de l'UMOA_Niger. 2025. "Établissements assujettis au contrôle de la Commission Bancaire de l'UMOA". Available at: https://cb-umoa.org/fr/etablissements-assujettis-au-controle-de-la-commission-bancaire-de-lumoa [Accessed: 13 March 2025].

Commission Bancaire de l'UMOA_Togo. 2024. "Établissements assujettis au contrôle de la Commission Bancaire de l'UMOA". Available at: https://cb-umoa.org/fr/etablissements-assujettis-au-controle-de-la-commission-bancaire-de-lumoa [Accessed: 13 March 2025].

Commission Bancaire de l'UMOA_Senegal. 2024. "Établissements assujettis au contrôle de la Commission Bancaire de l'UMOA". Available at: https://cb-umoa.org/fr/etablissements-assujettis-au-controle-de-la-commission-bancaire-de-lumoa [Accessed: 10 March 2025].

Congressional Budget Office. 2011. *Trends in the distribution of household income between 1979 and 2007*. Available at: https://www.cbo.gov/sites/default/files/cbofiles/attachments/10-25-HouseholdIncome.pdf [Accessed: 20 September 2024].

Consultative Group to Assist the Poor. 2011. *Global standard-setting bodies and financial inclusion for the poor*. Available at: https://www.gpfi.org/sites/gpfi/files/documents/White-Paper-Global-Standard-Setting-Bodies-Oct-2011.pdf [Accessed: 26 March 2023].

Consultative Group to Assist the Poor. 2025. *Financial inclusion*. Available at: https://www.cgap.org/about/financial-inclusion#:~:text=Research%20has%20shown%20that%2C%20by,climate%20change%2Drelated%20weather%20events [Accessed: 17 August 2025].

Corak, M. 2013. *Income inequality, equality of opportunity, and intergenerational mobility*. IZA Discussion Paper Series No. 7520, (Bonn: Institute for the Study of Labor).

Corporate Finance Institute. 2024. *Financial inclusion*. Available at: https://corporatefinanceinstitute.com/resources/economics/financial-inclusion/#:~:text=Having%20access%20to%20financial%20services,assets%20and%20building%20financial%20security [Accessed: 27 March 2024].

Cynamon, B.Z. & Fazzari, S.M. 2013. *Inequality and household finance during the consumer age*. Working Paper no. 752, Levy Economics Institute, Annandale-on-Hudson, New York.

Dabla-Norris, M.E., Kochhar, M.K., Suphaphiphat, M.N., Ricka, M.F. & Evridiki, T. 2015. *Causes and consequences of income inequality: A global perspective*. International Monetary Fund Discussion Note No. 15/13. Available at: https://www.imf.org/external/pubs/ft/sdn/2015/sdn1513.pdf [Accessed: 8 April 2022].

De Hoyos, R.E. & Sarafidis, V. 2006. Testing for cross-sectional dependence in panel-data models. *The Stata Journal*, 6(4): 482-496.

Deininger, K. & Squire, L. 1996. A new data set measuring income inequality. *The World Bank Economic Review*, 10(3): 565-591.

De Maio, F.G. 2007. Income inequality measures. *Journal of Epidemiol Community Health*, 61(10): 849-852. doi: 10.1136/jech.2006.052969 [Accessed: 23 March 2024].

Demir, A., Pesqué-Cela, V., Altunbaş, Y. & Murinde, V. 2022. Fintech, financial inclusion, and income inequality: a quantile regression approach. *The European Journal of Finance*, 28(1): 86-107. doi: 10.1080/1351847X.2020.1772335 [Accessed: 24 June 2022].

Demirgüç-Kunt, A., Beck, T. & Honohan, P. 2008. *Finance for All? Policies and Pitfalls in Expanding Access*. World Bank Policy Research Report. World Bank Group. Washington, DC. Available at: https://openknowledge.worldbank.org/handle/10986/6905 [Accessed: 01 August 2022].

Demirgüç-Kunt, A. & Levine, R. 2009. *Finance and inequality: Theory and evidence*. World Bank Development Group, Policy Research Working Paper No. 4967, Washington, DC.

Demirgüç-Kunt, A. & Klapper, L. 2012. *Measuring financial inclusion: The Global Findex*. World Bank Policy Research Working Paper Series 6025.

Demirgüç-Kunt, A. & Klapper, L. 2013. Measuring financial inclusion: Explaining variation in use of financial services across and within countries. *Brookings Papers on Economic Activity*, 2013(1), 279-340.

Demirgüç-Kunt, A., Klapper. K., Singer, D., Ansar, S. & Hess, J. 2018. *The Global Findex Database (2017): Measuring financial inclusion and the fintech revolution*. Washington DC: World Bank. Available online: https://openknowledge.worldbank.org/entities/publication/ed800062-e062-5a05-acdd-90429d8a5a07 [Accessed: 01 September 2025].

Dev, S.M. 2006. Financial inclusion: issues and challenges. *Economic and Political Weekly*, 41(41): 4310-4313.

Dickey, D.A. & Fuller, W.A. 1979. Distribution of the estimators for autoregressive time series with a unit root. *Journal of American Statistical Association,* 74(366a): 427-431.

Dickey, D.A. & Fuller, W.A. 1981. Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica*, 49(4): 1057-1072.

Dimova, R. & Adebowale, O. 2018. Does access to formal finance matter for welfare and inequality? Micro Level Evidence from Nigeria. *The Journal of Development Studies,* 54(9): 1534-1550.

Dogan, E., Madaleno, M. & Taskin, D. 2021. Financial inclusion and poverty: Evidence from Turkish household survey data. *Applied Economics*, 54(19): 2135-2147. Available at: https://doi.org/10.1080/00036846.2021.1985076 [Accessed: 21 October 2022].

Dollar, D. & Kraay, A. 2002. Growth is good for the poor. *Journal of Economic Growth*, 7(3): 195-225.

Durlauf, S.N. 1996. A theory of persistent income inequality. *Journal of Economic Growth*, 1(1996): 75-93.

El Bourainy, M., Salah, A. & El Sherif, M. 2021. Assessing the impact of financial inclusion on inflation rate in developing countries. *Open Journal of Social Sciences*, 9(1): 397-424. Available at: https://doi.org/10.4236/jss.2021.91030 [Accessed: 3 July 2024].

Emara, N. & Mohieldin, M. 2020. Financial inclusion and extreme poverty in the MENA region: A gap analysis approach. *Review of Economics and Political Science*, 5(3): 207-230.

Engle, R.F. & Granger, C.W.J. 1987. Cointegration and error correction: representation, estimation and testing. *Econometrica*, 55(2): 251-276.

Fisher, M.J. & Marshall, A.P. 2009. Understanding descriptive statistics. *Australian Critical Care*, 22(2): 93-97. Available at: https://doi.org/10.1016/j.aucc.2008.11.003 [Accessed: 3 July 2025].

Fouejieu, A., Sahay, R., Čihák, M. & Chen, S. 2020. Financial inclusion and inequality: A cross-country analysis, *The Journal of International Trade & Economic Development*, 29(8): 1018-1048. Doi: 10.1080/09638199.2020.1785532 [Accessed: 22 December 2023].

Fraser Institute Economic Freedom Dataset. 2025. Available at: https://efotw.org/economic-freedom/dataset?geozone=world&page=dataset&min-year=2004&max-year=2021&filter=1&date-type=range [Accessed: 17 March 2026].

Friedman, M. 1937. The use of ranks to avoid the assumption of normality implicit in the analysis of variance. *Journal of the American Statistical Association*, 32(200): 675-701.

Frost, J., Gambacorta, L. & Shin, H.S. 2021. *From financial innovation to inclusion. Finance & Development*. International Monetary Fund. Available at:

https://www.imf.org/external/pubs/ft/fandd/2021/03/making-financial-innovation-more-inclusive-frost.htm [Accessed: 27 March 2024].

Fu, Y. & Liu, L. 2023. On the accessibility of financial services and income inequality: An international perspective. *Technological and Economic Development of Economy*, 29(3): 814-845. https://doi.org/10.3846/tede.2023.18722 [Accessed: 19 December 2023].

Galor, O. & Zeira, J. 1993. Income distribution and macroeconomics. *The Review of Economic Studies*, 60(1): 35-52.

Gardeva, A. & Rhyne, E. 2011. *Opportunities and obstacles to financial inclusion*. Survey Report, Center for Financial Inclusion at ACCION International. Publication 12. Available at: https://content.centerforfinancialinclusion.org/wp-content/uploads/sites/2/2018/08/opportunities-and-obstacles-to-financial-inclusion_110708_final.pdf [Accessed: 27 March 2024].

Gengenbach, C., Palm, F.C. & Urbain, J-P. 2006. Cointegration testing in panels with common factors. *Oxford Bulletin of Economics and Statistics*, 68(1): 683-719.

Gine, X. & Townsend, R.M. 2004. Evaluation of financial liberalization: A general equilibrium model with constrained occupation choice. *Journal of Development Economics,* 74(2): 269-307.

Girma, A.G. & Huseynov, F. 2024. The causal relationship between fintech, financial inclusion, and income inequality in African economies. *Journal of Risk and Financial Management*, 17(1): 1-15. Available at: https://doi.org/10.3390/jrfm17010002 [Accessed: 17 August 2025].

Global Partnership for Financial Inclusion. 2016. *G20 Financial inclusion indicators*. Available at: https://www.gpfi.org/sites/gpfi/files/G20%20Set%20of%20Financial%20Inclusion%20Indicators.pdf [Accessed: 27 March 2024].

Granger, C.W.J. 1981. Some properties of time series data and their use in econometric model specification. *Journal of Econometrics*, 16(1981): 121-130.

Greenwood, J. & Jovanovic, B. 1990. Financial development, growth, and the distribution of income. *Journal of Political Economy*, 98(5): 1076-1107.

Haans, R.F.J., Pieters, C. & He, Z.-L. 2016. Thinking about U: Theorising and testing U- and inverted-U shaped relationships in strategy research. *Strategic Management Journal,* 37(7): 1177-1195.

Hadri, K. 2000. Testing for unit roots in heterogeneous panel data. *Econometrics Journal*, 3(2):148-161.

Hajji, Z., Abidine, M.Z.E., Bouhmala, A. & Chtaoui, A. 2024. Social protection in Morocco: Current state and prospects. *International Journal for Multidisciplinary Research*, 6(2): 1-11.

Hall, J. 2024. *The mobile money ecosystem, Africa*. Interledger Foundation. Available at: http://interledger.org/news/mobile-money-ecosystem-africa -:~:text=In%20charting%20mobile%20money%2C%20GSMA,%2444.9%20billion%20volume%20in%20payments [Accessed: 17 February 2025].

Hamadeh, N., Van Rompaey, C. & Metreau, E. 2023. *World Bank Group country classifications by income level for FY24 (July 1, 2023 – June 30, 2024)*. World Bank. Available at: https://blogs.worldbank.org/en/opendata/new-world-bank-group-country-classifications-income-level-fy24#:~:text=The%20World%20Bank%20Group%20assigns,of%20the%20previous%20calendar%20year [Accessed: 30 April 2024].

Hasell, J. & Roser, M. 2023. Measuring inequality: What is the Gini coefficient? Available at: https://ourworldindata.org/what-is-the-gini-coefficient [Accessed: 10 December 2023].

Hassan, A.S. & Meyer, D.F. 2020. Financial development – income inequality nexus in South Africa: A non-linear analysis. *International Journal Of Economics And Finance Studies*, 12(2): 335-351.

Honohan, P. 2008. Cross-country variation in household access to financial services. *Journal of Banking and Finance,* 32(11): 2493-2500.

Honohan, P. & Beck, T. 2007. *Making finance work for Africa.* Washington DC: World Bank.

Housing Finance Africa_Eritrea. 2021. *Africa Housing Finance Yearbook 2021*. Available at: https://housingfinanceafrica.org/app/uploads/2021/11/Eritrea.pdf [Accessed: 12 March 2025].

Huang, Y. & Zhang, Y. 2020. Financial inclusion and urban-rural income inequality: Long-run and short-run relationships. *Emerging Markets Finance and Trade*, 56(2): 457-471. Doi: https://doi.org/10.1080/1540496X.2018.1562896 [Accessed: 12 December 2023].

Hurlin, C. & Mignon, V. 2007. *Second generation panel unit root tests*. Working Paper No. halshs-00159842. Available at: https://halshs. archives-ouvertes.fr/halshs-00159842 [Accessed: 11 April 2025].

Im, K.S., Pesaran, M.H. & Shin, Y. 2003. Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115(1): 53-74.

International Labour Office. 2020. *Report on employment in Africa (Re-Africa)*. Geneva: ILO. Available at: https://www.ilo.org/africa/information-resources/publications/WCMS_753300/lang--en/index.htm [Accessed: 12 December 2023].

International Monetary Fund. 2014. *Fiscal policy and income inequality*. International Monetary Fund Policy Paper, Washington. Available at: https://www.imf.org/external/np/pp/eng/2014/012314.pdf [Accessed: 9 January 2024].

International Monetary Fund. 2022. *Income inequality: Introduction to inequality*. Available at: https://www.imf.org/en/Topics/Inequality/introduction-to-inequality#:~:text=Inequality%20can%20be%20viewed%20from,evenly%20distributed%20within%20a%20population [Accessed: 2 November 2023].

International Monetary Fund. 2023. *Republic of Madagascar: Selected issues*. IMF Country Report No. 23/118. doi: https://doi.org/10.5089/9798400236495.002 [Accessed: 2 January 2025].

International Monetary Fund. 2024. *Financial Access Survey*. Available at: https://data.imf.org/?sk=e5dcab7e-a5ca-4892-a6ea-598b5463a34c [Accessed: 27 November 2024].

International Fund for Agricultural Development & World Bank. 2015. *The use of remittances and financial inclusion*. A report prepared by the International Fund for Agricultural Development and the World Bank Group to the G20 global partnership for financial inclusion. Available at: https://www.ifad.org/en/web/knowledge/-/publication/the-use-of-remittances-and-financial-inclusi-1 [Accessed 14 April 2023].

Islam, S.N. 2015. *Inequality and environmental sustainability*. DESA Working Paper No. 145 ST/ESA/2015/DWP/145, Department of Economic and Social Affairs, New York, NY.

Jaffee, D.M. 1989. *Credit Rationing*. In: Eatwell, J., Milgate, M. & Newman, P. (Eds.) *Money. The New Palgrave*. Palgrave Macmillan, London. Available at: https://doi.org/10.1007/978-1-349-19804-7_10 [Accessed: 4 April 2024].

Jaumotte, F., Lall, S. & Papageorgiou, C. 2013. Rising income inequality: Technology, or trade and financial globalization? *IMF Economic Review*, 61(2): 271-309.

Kakwani, N.C. 1980. *Income inequality and poverty: methods of estimation and policy applications.* Report No 10092. A World Bank Research Publication.

Kamande, A. & Hallum, C. 2025. *Africa's Inequality Crisis and the Rise of the Super-Rich*. OXFAM International. Available at: https://www.oxfam.org/en/research/africas-inequality-crisis-and-rise-super-rich [Accessed: 18 March 2026].

Kanaan, T.H. (Ed). 1997. *The Social Effects of Economic Adjustment on Arab Countries*. Washinton DC: International Monetary Fund.

Kapingura, F.M. 2017. Financial sector development and income inequality in South Africa. *African Journal of Economic and Management Studies*, 8(4): 420-432.

Kaufmann, D., Kraay, A., & Mastruzzi, M. 2010. *The worldwide governance indicators: Methodology and Analytical Issues*. Policy Research Working Paper, World Bank.

Kazemikhasragh, A. & Pineda, M.V.B. 2022. Financial inclusion and education: An empirical study of financial inclusion in the face of the pandemic emergency due to COVID-19 in Latin America and the Caribbean. *Review of Development Economics*, 26(3): 1785-1797.

Kebede, J., Naranpanawa, A. & Selvanathan, S. 2023 Financial inclusion and income inequality nexus: A case of Africa. *Economic Analysis and Policy*, 77(2023): 539-557. Available at: https://doi.org/10.1016/j.eap.2022.12.006 [Accessed: 28 December 2023].

Keefer, P. & Knack, S. 2002. Polarisation, politics and property rights: Links between inequality and growth. *Public Choice*, 111(2002): 127-154. Available at: https://doi.org/10.1023/A:1015168000336 [Accessed: 10 September 2024].

Kempson, E. & Whyley, C. 1999. *Kept out or opted out? Understanding and combating financial exclusion.* University of Bristol: Policy Press. Available at: http://books.google.com/books?id=eLsdAAAACAAJ&pgis=1 [Accessed: 6 February 2022].

Khan, I. & Khan, I. 2023. Financial inclusion matter for poverty, income inequality and financial stability in developing countries: New evidence from public good theory. *International Journal of Emerging Markets*, Volume ahead of print:1-21. doi: 10.1108/IJOEM-10-2021-1627 [Accessed: 12 December 2023].

Khan, I., Khan, I., Sayal, A.U. & Khan, M.Z. 2022. Does financial inclusion induce poverty, income inequality, and financial stability: Empirical evidence from the 54 African countries? *Journal of Economic Studies*, 49(2): 303-314. doi: 10.1108/JES07-2020-0317 [Accessed: 27 July 2023].

Kim, J.-H. 2016. A study on the effect of financial inclusion on the relationship between income inequality and economic growth. *Emerging Markets Finance and Trade*, 52(2): 498-512. Available at: https://doi.org/10.1080/1540496X.2016.1110467 [Accessed: 18 October 2022].

Klapper, L., Laeven, L. & Rajan, R. 2006. Entry regulation as a barrier to entrepreneurship. *Journal of Financial Economics*, 82(3): 591-629.

Kling, G., Pesqué-Cela, V., Tian, L. & Lou, D. 2022. A theory of financial inclusion and income inequality. *The European Journal of Finance*, 28(1): 137-157. Available at: https://doi.org/10.1080/1351847X.2020.1792960 [Accessed: 25 March 2023].

Koenker, R. 2005. *Quantile Regression. Econometric Society Monograph Series*. Cambridge Univ. Press, Cambridge

Koenker, R. & Bassett, G. 1978. Regression Quantiles. *Econometrica,* 46(1): 33-50.

Koomson, I., Villano, R.A. & Hadley, D. 2020. Effect of financial inclusion on poverty and vulnerability to poverty: Evidence using a multidimensional measure of financial inclusion. *Social Indicators Research*, 149(2): 613-639. Available at: https://doi.org/10.1007/s11205-019-02263-0 [Accessed: 20 July 2023].

Kumar, N. 2013. Financial inclusion and its determinants: Evidence from India. *Journal of Financial Economic Policy*, 5(1): 4-19.

Kuznets, S. 1955. Economic growth and income inequality. *The American Economic Review*, 45(1): 1-28.

Lal, T. 2018. Impact of financial inclusion on poverty alleviation through cooperative banks. *International Journal of Social Economics*, 45(5): 808-828.

Le, Q.C., Ho, H.L. & Mai, N.C. 2019. The impact of financial inclusion on income inequality in transition economies. *Management Science Letters*, 9(2019): 661-672.

Lee, J.W. & Lee, H. 2018. *Human capital and income inequality*. ADBI Working Paper No. 810. Asian Development Bank Institute (ADBI), Tokyo. Available at:

https://hdl.handle.net/10419/190231 [Accessed: 11 November 2024].

Levin, A. & Lin, C.-F. May. 1992. *Unit root tests in panel data: asymptotic and finite-sample properties*. UC San Diego, Working Paper 92-23.

Levin, A., Lin, C.F. & Chu, C.S.J. 2002. Unit root tests in panel data: asymptotic and finite sample properties. *Journal of Economics*, 108(1): 1-24.

Leyshon, A. & Thrift, N. 1995. Geographies of financial exclusion: Financial abandonment in Britain and the United States. *The Royal Geographical Society* (with the Institute of British Geographers), 20(3): 312-341. Available at: https://doi.org/10.2307/622654 [Accessed: 23 March 2024].

Liao, T.F. 2016. Evaluating distributional differences in income inequality. *Socius: Sociological Research for A Dynamic World*, 2(2016): 1-14. doi: 10.1177/2378023115627462 [Accessed: 12 October 2023].

Libya Herald. 2022. *Banks: Libya*. Available at: https://libyaherald.com/libya-guide/banks/ [Accessed: 7 March 2025].

Lim, G.C. & McNelis, P.D. 2014. *Income inequality, trade and financial openness*. Melbourne Institute Working Paper No. 7/14, Fordham University Schools of Business Research Paper No. 2425068. Available at: http://dx.doi.org/10.2139/ssrn.2425068 [Accessed: 2 February 2023].

Livingston, E.H. 2004. The mean and standard deviation: What does it all mean? *Journal of Surgical Research*, 119(2): 117-123.

Loury, G.C. 1981. Intergenerational transfers and the distribution of earnings. *Econometrica*, 49(4): 843-867. Available at: http://links.jstor.org/sici?sici=0012-9682%28198107%2949%3A4%3C843%3AITATDO%3E2.0.CO%3B2-C [Accessed: 10 December 2023].

Lui, D., Zhang, Y., Hafeez, M. & Ullah, S. 2022. Financial inclusion and its influence on economic-environmental performance: demand and supply perspectives. *Environmental Science and Pollution Research*, 29(2022): 58212-58221. Available at: https://doi.org/10.1007/s11356-022-18856-1 [Accessed: 25 October 2023].

Mada-Books. 2024. Banks: Madagascar. Available at: https://www.mada-books.com/banques [Accessed: 13 March 2025].

Maddala, G.S. & Wu, S. 1999. A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics*, 61(S1): 31-652.

Maity, S. & Sahu, T.N. 2023. Bank branch outreach and access to banking services toward financial inclusion: An experimental evidence. *Rajagiri Management Journal*, 17(2): 170-182.

Marques, J.S. 2012. *Mozambique social protection assessment: Review of social assistance programs and social protection expenditures*. Social protection and labour. World Bank discussion paper No. 1408. Available at: https://documents1.worldbank.org/curated/en/422151468338395896/pdf/889980NWP0P13200Box385260B00PUBLIC0.pdf [Accessed: 2 January 2025].

Md Jamil, A.R., Law, S.H., Khair-Afham, M.S. & Trinugroho, I. 2024. Financial inclusion and income inequality in developing countries: The role of aging populations. *Research in International Business and Finance*, 67(Part A): 1-20.

Menyelim, C.M., Babajide, A.A., Omankhanlen, A.E. & Ehikioya, B.I. 2021. Financial inclusion, income inequality and sustainable economic growth in Sub-Saharan African countries. *Sustainability*, 13(4): 1-15.

Ministry of Education and Sports. 2022. *Skills development in Uganda*. Available at: https://www.education.go.ug/wp-content/uploads/2022/06/ToR-for-end-of-Project-Evaluation-USDP-Revised-to-suit-Consultancy-firm.pdf [Accessed: 6 December 2024].

Ministry of Gender, Labour and Social Development. 2015. *The national social protection policy: Income security and dignified lives for all*. Available at: https://socialprotection.go.ug/wp-content/uploads/2016/07/National-Social-Protection-Policy-uganda.pdf [Accessed: 6 December 2024].

Moon, H.R. & Perron, B. 2004. *Asymptotic local power of pooled t-ratio tests for unit roots in panels with fixed effects*. Mimeo, University of Montréal.

Muriu, P. 2020. *Role of institutional quality in promoting financial inclusion*. Research Paper No. 384. Nairobi: African Economic Research Consortium.

Murtazashvili, I. & Wooldridge, J.M. 2008. Fixed effects instrumental variables estimation in correlated random coefficient panel data models. *Journal of Econometrics*, 142(1): 539-552.

Mushtaq, R. & Bruneau, C. 2019. Microfinance, financial inclusion, and ICT: Implications for poverty and inequality. *Technology in Society*, 59(2019): 1-36. Available at: https://doi.org/10.1016/j.techsoc.2019.101154 [Accessed: 3 March 2023].

Naceur, S.B. & Zhang, R. 2016. *Financial development, inequality and poverty: Some international evidence*. International Monetary Fund Working Paper 16/32.

Naceur S.B., Chami, R. & Trabelsi, M. 2020. *Do remittances enhance financial inclusion in low and middle-income countries and in fragile states?* International Monetary Fund Working Papers, WP/20/66.

Náñez Alonso, S.L., Jorge-Vazquez, J., Arias, L.G. & del Nogal, N.M. 2024. What factors are limiting financial inclusion and development in Peru? Empirical Evidence. *Economies*, 12(4): 93. Available at: https://doi.org/10.3390/economies12040093 [Accessed: 23 March 2024].

National Bank of Ethiopia. 2024. *List of banks*. Available at: https://web.archive.org/web/20110714160907/http:/www.nbebank.com/financial/banks.htm [Accessed: 12 March 2025].

National Bank of Rwanda. 2025. *"List of supervised banks"*. Available at: https://www.bnr.rw/documents/LIST_OF_SUPERVISED_BANKS.pdf [Accessed: 10 March 2025].

National Treasury. 2020. *An inclusive financial sector for all*. Financial inclusion policy paper. Available at: http://www.treasury.gov.za/comm_media/press/2020/Financial%20Inclusion%20Policy%20-%20An%20Inclusive%20Financial%20Sector%20For%20All.pdf [Accessed: 01 August 2022].

Ncube, M., Anyanwu, J. & Hausken, K. 2013. *Inequality, economic growth, and poverty in the Middle East and North Africa (MENA)*. African Development Bank Group. Working Paper No 195. Available at: https://www.afdb.org/sites/default/files/documents/publications/working_paper_195_-_inequality_economic_growth_and_poverty_in_the_middle_east_and_north_africa_mena.pdf [Accessed: 12 December 2024].

NCR. 2017. *The role of the ATM in driving financial inclusion worldwide*. Available at: https://www.ncr.com/content/dam/ncrcom/content-type/white_papers/17fin8384_financial_inclusion_wp_v1_3.pdf [Accessed: 2 July 2023].

Ndoricimpa, A. 2017. *Threshold effects of inflation on economic growth in Africa: Evidence from a dynamic panel threshold regression approach*. Working Paper Series No 249. African Development Bank. Abidjan: Côte d'Ivoire.

Neaime, S. & Gaysset, I. 2018. Financial inclusion and stability in MENA: Evidence from poverty and inequality. *Finance Research Letters*, 24(2018): 230-237. Available at: https://doi.org/10.1016/j.frl.2017.09.007 [Accessed: 30 May 2022].

Nel, P. 2018. Inequality in Africa. The Routledge Handbook of African Development. London: Routledge.

Nguyen, T.T.H. 2021. Measuring financial inclusion: A composite FI index for the developing countries. *Journal of Economics and Development*, 23(1): 77-99.

Nielsen, L. 2011. *Classifications of countries based on their level of development: How it is done and how it could be done*. International Monetary Fund Working Paper, WP/11/31. Available at: https://www.imf.org/external/pubs/ft/wp/2011/wp1131.pdf [Accessed at: 30 April 2024].

Nikoloski, Z. 2012. Financial sector development and inequality: Is there any financial Kuznets curve? *Journal of International Development*, 25(7): 897-911.

Ninno, C.D. & Tamiru, K. 2012. A*frica social safety net and social protection assessment series: Cameroon social safety nets, social protection and labour*. World Bank discussion paper No. 1404. Available at: https://documents1.worldbank.org/curated/ar/365921468012066393/pdf/889950NWP0P132085256B00PUBLIC001404.pdf [Accessed: 30 December 2024].

Nissanke, M. & Thorbecke, E. 2007. *Globalisation, growth, and poverty in Africa*. UNU-WIDER Blog. Available at: https://www.wider.unu.edu/publication/globalization-growth-and-poverty-africa [Accessed: 10 September 2024].

Nkuna, O., Lapukeni, A., Kaude, P. & Kabango, G. 2018. The role of commercial banks on financial inclusion in Malawi. *Open Journal of Business and Management*, 6(4): 812-832. doi: 10.4236/ojbm.2018.64061 [Accessed: 17 August 2023].

Nsiah, A.Y. & Tweneboah, G. 2023. Determinants of Financial Inclusion in Africa: Is Institutional Quality Relevant? *Cogent Social Sciences*, 9(1): 1-23. Available at: https://doi.org/10.1080/23311886.2023.2184305 [Accessed: 2 September 2024].

Nutassey, V.A., Sibanda, M. & Nomlala, B.C. 2023. The role of regulation in the relationship between financial development and inclusive finance in Sub-Saharan Africa. *Cogent Business & Management*, 10(3): 1-20. Available at: https://doi.org/10.1080/23311975.2023.2285283 [Accessed: 2 September 2024].

Nyantakyi, B.E. & Sy, M. 2015. The banking system in Africa: Main facts and challenges. African Development Bank Group, *Africa Economic Brief*, 6(5): 1-16.

Odhiambo, N.M. 2020. Financial development, income inequality and carbon emissions in Sub-Saharan African countries: A panel data analysis. *Energy Exploration & Exploitation*, 38(5): 1914-1931.

Odusola, A. 2017. *Fiscal policy, redistribution and inequality in Africa*. UNDP Africa Reports 267032, United Nations Development Programme (UNDP).

Office of the Prime Minister. 2020. *Voluntary national review report on the implementation of the 2030 agenda for sustainable development*. The Republic of Uganda. Available at: file:///C:/Users/khole/Downloads/undp-ug-VNR-Report_FINAL-JULY-2020.pdf [Accessed: 6 December 2024].

Omar, M.A. & Inaba, K. 2020. Does financial inclusion reduce poverty and income inequality in developing countries? A panel data analysis. *Journal of Economic Structures*, 37(2020): 1-25. Available at: https://doi.org/10.1186/s40008-020-00214-4 [Accessed: 27 July 2023].

Organisation for Economic Co-operation and Development. 2005. *Improving financial literacy: Analysis of issues and policie*s. OECD Publishing. Paris. Available at: https://doi.org/10.1787/9789264012578-en [Accessed: 29 July 2024].

Organisation for Economic Co-operation and Development. 2013. *Financial literacy and inclusion: Results of OECD/INFE survey across countries and by gender*. Available at: https://www.oecd.org/daf/fin/financial-education/TrustFund2013_OECD_INFE_Fin_Lit_and_Incl_SurveyResults_by_Country_and_Gender.pdf [Accessed: 26 March 2024].

Organisation for Economic Co-operation and Development. 2016. *Index and estimations techniques, in OECD regions at Glance 2016.* OECD Publishing. Paris. Available at: https://doi.org/10.1787/reg_glance-2016-50-en. [Accessed: 8 January 2024].

Organisation for Economic Co-operation and Development. 2020a. *Boosting access to credit and ensuring financial inclusion for all in Costa Rica*. Available at: https://doi.org/10.1787/86037778-en [Accessed: 6 November 2024].

Organisation for Economic Co-operation and Development Legal Instruments. 2020b. *Recommendation of the council on financial literacy*. Available at: https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0461 [Accessed: 31 July 2024].

Organisation for Economic Co-operation and Development. 2024a. *Financial education*. Available at: https://www.oecd.org/en/topics/sub-issues/financial-education.html [Accessed: 31 July 2024].

Organisation for Economic Co-operation and Development. 2024b. *Inequality: Income inequality*. Available at: https://www.oecd-ilibrary.org/social-issues-migration-health/income-inequality/indicator/english_459aa7f1-en#:~:text=The%20Palma%20ratio%20is%20the,with%20the%20lowest%20disposable%20income [Accessed: 6 November 2024].

Organisation for Economic Co-operation and Development, African Development Bank, United Nations Economic Commission for Africa and United Nations Development Programme. 2011. *African economic outlook 2011: Africa and its emerging partners*. OECD Publishing. Paris. Available at: https://www.oecd.org/en/publications/african-economic-outlook-2011_aeo-2011-en.html [Accessed: 5 September 2024].

Oshora, B., Desalegn, G., Gorgenyi-Hegyes, E., Fekete-Farkas, M. & Zeman, Z. 2021. Determinants of financial inclusion in small and medium enterprises: Evidence from Ethiopia. *Journal of Risk and Financial Management* 14(7): 1-19. Available at: https://doi.org/10.3390/jrfm14070286 [Accessed: 26 October 2023].

Ostry, J.D., Berg, A. & Tsangarides, C. 2014. *Redistribution, inequality, and growth*. International Monetary Fund (IMF) Staff Discussion Note 14/02, Washington.

Ouechtati, I. 2020. The contribution of financial inclusion in reducing poverty and income inequality in developing countries. *Asian Economic and Financial Review*, 10(9): 1051-1061. doi: 10.18488/journal.aefr.2020.109.1051.1061 [Accessed: 12 December 2023].

Ozili, P.K. 2018. Impact of digital finance on financial inclusion and stability. *Borsa Instabul Review*, 18(4): 329-340.

Ozili, P.K. 2020. Theories of financial inclusion. In Özen, E. & Grima, S. (Eds.). *Uncertainty and Challenges in Contemporary Economic Behaviour*. Emerald Publishing Limited: Bingley, 89-115. Available at: https://doi.org/10.1108/978-1-80043-095-220201008 [Accessed: 1 July 2022].

Panizza, U. 2002. Income inequality and economic growth: Evidence from American data. *Journal of Economic Growth*, 7(2002): 25-41. Available at: https://doi.org/10.1023/A:1013414509803 [Accessed: 20 June 2022].

Park, C-Y. & Mercado, R. 2015. *Financial inclusion, poverty, and income inequality in developing Asia*. Asian Development Bank Economics Working Paper Series No. 426.

Park, C-Y. & Mercado, R.V. 2016. *Does financial inclusion reduce poverty and income inequality in developing Asia*? Palgrave Studies in Impact Finance. In Sasidaran Gopalan, S. & Kikuchi, T. (Eds.), *Chapter 3: Financial Inclusion in Asia*. Palgrave Macmillan, 61-92.

Park, C-Y. & Mercado, R. 2018. Financial inclusion, poverty, and income inequality. *The Singapore Economic Review*, 63(1): 185-206.

Persson, T. & Tabellini, G. 1994. Is inequality harmful for growth? Theory and evidence. *American Economic Review*, 84(3): 600-621.

Pesaran, M.H. 2004**.** *General diagnostic tests for cross-sectional dependence in panels*. CESifo Working Paper Series No. 1229, and IZA Discussion Paper No. 1240.

Pesaran, M.H. 2021. General diagnostic tests for cross-sectional dependence in panels. *Empirical Economics*, 60(2021): 13-50.

Petscher, Y., & Logan, J. A. R. 2014. Quantile regression in the study of developmental sciences. *Child Development*, 85(3): 861-881.

Piketty, T. 1993. *Imperfect Capital Markets and Persistence of Initial Wealth Inequalities*. Working Paper Sticerd-Lse, No. TE92255.

Piketty, T. 1997. The dynamics of the wealth distribution and the interest rate with credit rationing. *Review of Economics Studies*, 64(2): 173-189.

Phillips, P.C.B. 1987. Time series regression with a unit root. *Econometrica*, 55(2): 277-301.

Phillips, P.C.B. & Perron, P. 1988. Testing for a unit root in time series regression. *Biometrika,*

75(2): 335-346.

Privacy Shield Framework. 2025. *Chad - US banks and local correspondent banks*. Available at: https://www.privacyshield.gov/ps/article?id=Chad-US-Banks-and-Local-Correspondent-Banks [Accessed: 12 March 2025].

Raihanath, M. & Pavithran, K. 2014. Role of commercial banks in the financial inclusion programme. *Journal of Business Management and Social Sciences Research*, 3(5): 1-10.

Raju, D. & Younger, S.D. 2021. *Social assistance programs and household welfare in Eswatini*. World Bank social protection & jobs discussion paper No. 2106. Available at: https://thedocs.worldbank.org/en/doc/266201cdedf8f28c6406e3674e00f01c-0380022021/original/2106.pdf [Accessed: 30 December 2024].

Ratha, D. 2007. Leveraging remittances for development. *Policy Brief,* 3(11): 173-309.

Ratnawati, K. 2020. The impact of financial inclusion on economic growth, poverty, income inequality, and financial stability in Asia. *Journal of Asian Finance, Economics and Business*, 7(10): 073-085.

Ray, K., Das, R.C. & Das, U. 2016. *Convergence aspect of capital formation: A study of major countries*. In book*: Handbook of Research on global indicators of economic and political convergence,* 51-66. doi: 10.4018/978-1-5225-0215-9.ch003 [Accessed: 30 April 2024].

Rehman, H., Khan, S. & Ahmad, I. 2008. Income distribution, growth and financial development: A cross countries analysis. *Pakistan Economic and Social Review*, 46(1): 1-16.

Remessa Online. 2025. *"Resultado de bancos com códigos SWIFT/BIC em Sao Tome and Principe"*. Available at: https://www.remessaonline.com.br/codigo-swift/paises/Sao%20Tome%20and%20Principe [Accessed: 10 March 2025].

République du Cameroun - Ministere des finances. 2025."Secteur financier au 30 septembre 2023". Available at: https://dgtcfm.cm/secteur-financier/liste-des-bureaux-de-change/ [Accessed: 6 March 2025].

Reserve Bank of Malawi. 2025. *List of banks and other financial institutions*. Available at: https://www.rbm.mw/Supervision/BankSupervision/?activeTab=BASURegisteredBanks Accessed: 5 March 2025].

Reserve Bank of Zimbabwe. 2024. *AFC Commercial Bank Limited*. "Consolidated Banking Institutions' Information as at 30 June 2024". Available at: https://www.rbz.co.zw/documents/BLSS/Supervision%20Publications/Consolidated_Banking_Institutions_Information_as_at_30_June_2024.pdf [Accessed: 11 March 2025].

Rowell, D. & Connelly, L.B. 2012. A history of the term moral hazard. *The Journal of Risk and Insurance*, 79(4): 1051-1075.

Sahay, R., Čihák, M., N'Diaye, P., Barajas, A., Mitra, S., Kyobe, A., Mooi, Y.N. & Yousef, S.R. 2015. *Financial inclusion: can it meet multiple macroeconomic goals?* IMF Staff Discussion Notes 15/17, International Monetary Fund. Available at: https://www.imf.org/external/pubs/ft/sdn/2015/sdn1517.pdf [Accessed: 1 June 2022].

Saoudi, H. & Loius-Sarbib, J. 2023. *Fighting inequalities: A major challenge and an essential prerequisite for inclusive and sustainable growth in Africa*. Emerging Markets Forum. Books & Reports, Policy Center for the New South, number 50, October.

Sarma, M. 2008. *Index of financial inclusion*. Indian Council for Research on International Economic Relations. Working Paper No. 215.

Sarma, M. 2016. *Measuring financial inclusion for Asian economies*. In *Financial Inclusion in Asia*. UK, London: Palgrave Macmillan, 3-34.

Sawadogo, R. & Semedo, G. 2021. Financial inclusion, income inequality, and institutions in sub-Saharan Africa: Identifying cross-country inequality regimes. *International Economics*, 167(2021): 15-28. Available at: https://doi.org/10.1016/j.inteco.2021.05.002 [Accessed: 27 July 2023].

Segning, B.A., Djiogap, C.F., Piabuo, S.M. & Noupie, E.N. 2023. Financial inclusion and income inequality in sub-Saharan Africa: Taking socio-cultural particularities into account. *Journal of the Knowledge Economy*, (2023): 1-24. Available at: https://doi.org/10.1007/s13132-023-01207-x [Accessed: 27 July 2023].

Seifelyazal, M., Salaheldin, A. & Assem, M. 2023. The impact of financial inclusion on income inequality. *Open Journal of Social Sciences,* 11(2023): 255-274. doi: 10.4236/jss.2023.116018 [Accessed: 6 September 2023].

Seven, U. & Coskun, Y. 2016. Does financial development reduce income inequality and poverty? Evidence from emerging countries. *Emerging Markets Review*, 26(2016): 34-63.

Sharma, D. 2016. Nexus between financial inclusion and economic growth: Evidence from the emerging Indian economy. *Journal of Financial Economic Policy*, 8(1): 13-36.

Shimeles, A. & Nabassaga, T. 2018. Why is inequality high in Africa? *Journal of African Economies*, 27(1): 108-126. Available at: http://dx.doi.org/10.1093/jae/ejx035 [Accessed: 12 December 2023].

Sinclair, S.P. 2001. *Financial exclusion: An introductory survey*. Report of Centre for Research in Socially Inclusive Services. Heriot-Watt University, Edinburgh.

Sohn, J., Lee, J. & Kim, N. 2020. Going green inside and out: Corporate environmental responsibility and financial performance under regulatory stringency. *Sustainability*, 12(9): 1-23.

South African Reserve Bank. 2020. *SA registered banks and representative offices*. Available at: https://www.resbank.co.za/en/home/what-we-do/Prudentialregulation/sa-registered-banks-and-representative-offices [Accessed: 12 March 2025].

South African Reserve Bank. 2024. *SA registered of co-operative banks*. Available at: https://www.resbank.co.za/content/dam/sarb/what-we-do/prudential-regulation/pa-registered-co-ops/Register%20of%20Co-ops%20Banks-Membership%20and%20deposits_November%202024.pdf [Accessed: 12 March 2025].

Statista. 2024a. *Share of economic sectors in GDP in Sub-Saharan Africa 2010-2023*. Available at: https://www.statista.com/statistics/1322302/share-of-economic-sectors-in-gdp-in-sub-saharan-africa/ [Accessed: 10 September 2024].

Statista. 2024b. *Unemployment rate in Africa from 2012 to 2024 by gender*. Available at: https://www.statista.com/statistics/1319852/unemployment-rate-in-africa-by-gender/ [Accessed: 11 September 2024].

Statista. 2024c. *20 countries with the biggest inequality in income distribution worldwide in 2023, based on the Gini index*. Available at: https://www.statista.com/statistics/264627/ranking-of-the-20-countries-with-the-biggest-inequality-in-income-distribution/#:~:text=Gini%20Index%20%2D%20countries%20with%20the%20biggest%20inequality%20in%20income%20distribution%202023&text=South%20Africa%20had%20the%20highest,neighbor%20Namibia%20followed%20in%20second [Accessed: 22 May 2024].

Statista. 2025. *Mobile money in Africa*. Available at: https://www.statista.com/study/78312/mobile-money-in-africa/ [Accessed: 17 February 2025].

Statistics South Africa. 2019. *Sustainable development goals country report 2019: South Africa*. Available at: https://www.statssa.gov.za/MDG/SDGs_Country_Report_2019_South_Africa.pdf [Accessed: 21 November 2024].

Steiger, J.H. 1979. *Factor indeterminacy in the 1930s and the 1970s: some interesting parallels.* University of British Columbia, 44(2): 157-167. Available at: https://doi.org/10.1007/BF02293967 [Accessed: 3 July 2025].

Sukmana, R. & Ibrahim, M.H. 2018. Financial access and inequality: A quantile assessment. *International Journal of Economics and Management,* 12(2): 551-557.

Tadei, F. 2024. *Income inequality in colonial Africa: Methods and history*. In Frankema, E. Ellen Hillbom, E.E. Kufakurinani, U. & Selhausen, F.M. (Eds.), *The History of African Development: An Online Textbook for a New Generation of African Students and Teachers.* African Economic History Network E-Book.

Takmaz, S., Sari, E. & Alatas, S. 2022. Financial inclusion in Turkey: Unpacking the provincial inequality and its determinants. *Applied Economics Letters*, (2022): 1-9. doi: 10.1080/13504851.2022.2141442 [Accessed: 19 December 2023].

Tebaldi E, Mohan R. 2010. Institutions and poverty. *The Journal of Development Studies*, 46(6):1047-1066.

Tchamyou, V.S. 2020. Education, lifelong learning, inequality, and financial access: Evidence from African countries. *Contemporary Social Science*, 15(1): 7-25.

Tchamyou, V.S., Erreygers, G. & Cassimon, D. 2019. Inequality, ICT, and financial access in Africa. *Technological Forecasting and Social Change*, 139(C): 169-184.

Tita A.F. & Aziakpono, M.H. 2017. The relationship between financial inclusion and income inequality in sub-Saharan Africa: Evidence from disaggregated data. *African Review of Economics and Finance*, 9(2): 30-65.

Todaro, M.P. & Smith, S.C. 2012. *Economic Development,* 11th Edition. Boston: Person.

Tok, Y.W. & Heng, D. 2022. *Fintech: Financial inclusion or exclusion?* Publisher: International Monetary Fund, Working Paper No.2022/080. Pages: 1-35. doi: https://doi.org/10.5089/9798400208645.00 [Accessed: 15 August 2024].

Townsend, R. & Ueda, K. 2006. Financial deepening, inequality, and growth: A model-based quantitative evaluation. *The Review of Economic Studies*, 73(1): 251-293. Available at: https://doi.org/10.1111/j.1467-937X.2006.00376.x [Accessed: 6 September 2023].

Toxopeus, H.S. & Lensink, R. 2008. *Remittances and financial inclusion in development*. In: Addison, T. and Mavrotas, G. (Eds.), *Development Finance in the Global Economy. Studies in Development Economics and Policy.* Palgrave Macmillan, London.

Trade Finance Africa. 2025. *Equatorial Guinea LC confirmation fees*. Available at: "Equatorial Guinea LC Issuing Bank Confirming Bank Charges 2024" [Accessed: 12 March 2025].

Tsouli, D. 2022. Financial inclusion, poverty, and income inequality: Evidence from high, middle, and low-income countries. *Scientific Annals of Economics and Business*, 69(1): 69-98. doi: 10.47743/saeb-2022-0005 [Accessed: 20 October 2022].

Tsouli, D. 2022. Financial inclusion, poverty, and income inequality: Evidence from European countries. *Ekonomika*, 101(1): 37-61. Available at: https://doi.org/10.15388/Ekon.2022.101.1.3 [Accessed: 20 October 2022].

Turégano, D.M. & García-Herrero, A. 2018. Financial inclusion, rather than size, is the key to tackling income inequality. *The Singapore Economic Review*, 63(1): 167-184. doi: 10.1142/S0217590818410047 [Accessed: 4 May 2023].

United Nations. 2015a. *Inequality measurements*. Available at: https://www.un.org/en/development/desa/policy/wess/wess_dev_issues/dsp_policy_02.pdf [Accessed: 23 March 2024].

United Nations. 2015b. *Transforming our world: The 2030 agenda for sustainable development*. Available at: https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf [Accessed: 1 November 2024].

United Nations. 2020. *Inequality – Bridging the divide*. Available at: https://www.un.org/en/un75/inequality-bridging-divide [Accessed: 22 March 2024].

United Nations. 2021. *Global research on governance and social protection: Case studies on Mauritius and Fiji*. Available at: https://social.desa.un.org/sites/default/files/migrated/22/2021/04/Mauritius-and-Fiji_SP-Governance.pdf [Accessed: 2 January 2025].

United Nations. 2024a. *About Us*. Available at: https://www.un.org/en/about-us [Accessed: 1 November 2024].

United Nations. 2024b. *Reduce inequality within and among countries*. Available at: https://sdgs.un.org/goals/goal10#targets_and_indicators [Accessed: 1 November 2024].

United Nations Children's Fund. 2022. *Social Protection: Burundi Budget analysis 2022-2023*. Available at: https://www.unicef.org/burundi/media/2876/file/5_ENG_ProtectionSociale_BudgetBrief%202022-2023.pdf%20.pdf [Accessed: 11 December 2024].

United Nations Development Programme. 2013. *The Gambia National Social Protection Policy 2015-2025*. Available at: https://www.unicef.org/gambia/media/606/file/The-Gambia-National-Social-Protection-Policy-2015-2025.pdf [Accessed: 30 December 2024].

United Nations Development Programme. 2024. *The Sustainable Development Goals in action*. Available at: https://www.undp.org/sustainable-development-goals [Accessed: 1 November 2024].

United Nations Economic Commission for Africa. 2024a. *Chapter 1: Recent economic, social, and climate developments*. Economic Report on Africa 2024. Available at: https://www.un-ilibrary.org/content/books/9789213589373c008 [Accessed: 18 March 2026].

United Nations Economic Commission for Africa. 2024b. *Despite challenges, Southern Africa has improved financial inclusion with the adoption of digital financial services*. Available at: https://www.uneca.org/stories/despite-challenges%2C-southern-africa-has-improved-financial-inclusion-with-adoption-of [Accessed: 18 March 2025].

UNU-WIDER: World Income Inequality Database. 2024. Available at: https://www.wider.unu.edu/database/world-income-inequality-database-wiid#WIIDcomp [Accessed: 29 October 2024].

Van der Hoeven, R. & Saget, C. 2004. *Labour market institutions and income inequality: What are the new insights after the Washington consensus?* In Cornia, G.A. (Ed.) *Inequality growth and poverty in an era of liberalisation and globalisation*. *Chapter 8*. Available at: https://doi.org/10.1093/0199271410.003.0008 [Accessed: 26 October 2023].

Van de Walle, N. 2009. The institutional origins of inequality in sub-Saharan Africa. *Annual Review of Political Science*, 12(2009): 307-327.

Verma, A. & Giri, A.K. 2022. Does financial inclusion reduce income inequality? Empirical evidence from Asian economies. *International Journal of Emerging Markets*, Volume and issue ahead-of-print: 1-18. Available at: https://doi.org/10.1108/IJOEM-02-2022-0271 [Accessed: 22 February 2024].

Volscho Jr, T.W. 2005. Minimum wages and income inequality in the American States, 1960–2000. *Research in Social Stratification and Mobility*, 23(2005): 343-368.

Williams, T.H., Grace, O.I., Ayodele, T.D., Olasupo, S.F. & Aladejebi, M.O. 2023. Do illiteracy and unemployment affect financial inclusion in the rural areas of developing countries? *Investment Management and Financial Innovations*, 20(2): 89-101.

Wong, Z.Z.A., Badeeb, R.A. & Philip, A.P. 2023. Financial inclusion, poverty, and income inequality in ASEAN Countries: Does financial innovation matter? *Social Indicators Research*, 169(2023): 471-503. Available at: https://doi.org/10.1007/s11205-023-03169-8 [Accessed: 12 December 2023].

World Bank. 2010. *Worldwide Governance Indicators for 2010*. Available at: https://www.worldbank.org/en/publication/worldwide-governance-indicators [Accessed: 22 June 2022].

World Bank. 2012a. *Getting to know the World Bank*. Available at: https://www.worldbank.org/en/news/feature/2012/07/26/getting_to_know_theworldbank#:~:text=The%20World%20Bank%20is%20an,of%20living%20of%20their%20people [Accessed: 31 July 2024].

World Bank. 2012b. *Productive social safety net project (APL I): Tanzania*. Available at: https://documents.worldbank.org/pt/publication/documents-reports/documentdetail/704091468122078480/tanzania-productive-social-safety-net-project [Accessed: 29 December 2024].

World Bank. 2012c. *The World Bank's social protection and labor strategy 2012–2022: resilience, equity, and opportunity*. Washington, DC: World Bank Group. Available at: https://documents1.worldbank.org/curated/pt/443791468157506768/pdf/732350BR0CODE200doc0version0REVISED.pdf [Accessed: 14 November 2024].

World Bank. 2012d. *The Republic of Rwanda for a support to the social protection system I (SSPS-I)*. Report No. 64346 – RW. Available at: https://documents.worldbank.org/en/publication/documents-reports/documentdetail/933071468307140860/rwanda-support-to-social-protection-system-project-ssps-i [Accessed: 2 January 2025].

World Bank. 2013a. *Igniting innovation in financial access – Webcast*. Available at: https://www.worldbank.org/en/events/2013/09/30/igniting-innovation-in-financial-access#1 [Accessed: 31 July 2024].

World Bank. 2013b. *Universal financial access is vital to reducing poverty, innovation key to overcoming the enormous challenge, says President Jim Yong Kim*. Available at: https://www.worldbank.org/en/news/press-release/2013/10/11/universal-financial-access-vital-reducing-poverty-innovation-jim-yong-kim [Accessed: 31 July 2024].

World Bank. 2013c. *Achieving universal financial access by 2020 requires the world bank group to 'think about what we need to do differently*. Available at: https://www.worldbank.org/en/news/feature/2013/11/07/achieving-universal-financial-access-by-2020-requires-the-wbg-to-think-about-what-we-need-to-do-differently [Accessed: 31 July 2024].

World Bank. 2013d. *Botswana social protection assessment*. Available at: https://documents1.worldbank.org/curated/en/421451468199469145/pdf/860090WP0P1274090Box382163B00PUBLIC00ACS.pdf [Accessed: 11 December 2024].

World Bank. 2013e. *Congo, Republic of Lisungi: Safety nets project (P145263)*. Available at: https://documents.worldbank.org/en/publication/documents-reports/documentdetail/939321468025765941/congo-republic-of-lisungi-safety-nets-project [Accessed: 30 November 2024].

World Bank. 2013f. *Environmental and social systems assessment of the Kenya national safety net program for results*. World Bank, Washington DC. Available at: https://documents1.worldbank.org/curated/zh/860201468048849025/pdf/E42020REV0Keny0110201300Box377337Bl.pdf [Accessed: 2 January 2025].

World Bank. 2013g. *Financial Inclusion plays vital role in reduction of poverty, inequality and stimulation of job creation*. Available at: https://www.worldbank.org/en/news/press-release/2013/05/29/financial-inclusion-plays-vital-role-in-reduction-of-poverty-inequality-and-stimulation-of-job-creation [Accessed: 19 March 2026].

World Bank. 2014. *Financial inclusion. Global financial report*. Available at: https://documents1.worldbank.org/curated/en/225251468330270218/pdf/Global-financial-development-report-2014-financial-inclusion.pdf [Accessed: 26 March 2024].

World Bank. 2015. *Overview: National Financial Inclusion Strategies*. Available at: Overview: National Financial Inclusion Strategies (worldbank.org) [Accessed: 23 September 2024].

World Bank. 2018. *Poverty and shared prosperity 2018: Piecing together the poverty puzzle*. Washington, DC: World Bank Group.

World Bank. 2019. *BI-social safety nets (Merankabandi) (P151835)*. Available at: https://documents1.worldbank.org/curated/en/898921559848918759/pdf/Disclosable-Version-of-the-ISR-BI-Social-Safety-Nets-Merankabandi-P151835-Sequence-No-04.pdf [Accessed: 11 December 2024].

World Bank. 2021a. *South Africa: Social assistance programs and systems review*. Policy brief. Available at: https://www.sassa.gov.za/newsroom/Documents/South Africa Social Assistance Programs and Systems Review Policy Brief.pdf [Accessed: 22 January 2025].

World Bank. 2021b. *Progress and obstacles: Financial inclusion in Africa. Regional Note 2021 edition*. Available at: https://thedocs.worldbank.org/en/doc/d6a96c32453175806ed5633e924db6de-0050062025/original/SSA-Progress-and-Obstacles-Note.pdf [Accessed: 8 September 2025].

World Bank. 2022a. *National financial inclusion strategies resource center*. Available at: https://www.worldbank.org/en/topic/financialinclusion/brief/financial-inclusion-strategies-resource-center [Accessed: 29 July 2024].

World Bank. 2022b. *Botswana social protection programs and systems review.* Available at: https://documents1.worldbank.org/curated/en/099645103062256866/pdf/P1721750af4ddb0ce098d30b331412b0ab8.pdf [Accessed: 21 November 2024].

World Bank. 2022c. *Global Financial Development Database*. Available at: https://www.worldbank.org/en/publication/gfdr/data/global-financial-development-database [Accessed: 28 June 2023].

World Bank. 2024a. *The Global Findex Database 2021: Financial inclusion, digital payments, and resilience in the age of COVID-19*. Available at: https://www.worldbank.org/en/publication/globalfindex [Accessed: 31 July 2024].

World Bank. 2024b. *Theil index*. Available at: https://databank.worldbank.org/metadataglossary/lac-equity-lab/series/3.0.TheilInd1 [Accessed: 23 March 2024].

World Bank. 2026. *Overview: Defining Digital Financial Services*. Available at: https://digitalfinance.worldbank.org/topics/dfs-overview [Accessed: 16 March 2026]

World Bank Group. 2013. *Shared prosperity: A new goal for a changing world*. Available at: https://www.worldbank.org/en/news/feature/2013/05/08/shared-prosperity-goal-for-changing-world [Accessed: 14 November 2024].

World Bank Group. 2018. *UFA2020 Overview: Universal Financial Access by 2020 October 1, 2018*. Available at: https://www.worldbank.org/en/topic/financialinclusion/brief/achieving-universal-financial-access-by-2020 [Accessed: 29 July 2024].

World Bank Group. 2019. *Doing business 2020: OECD high-income economies remain global benchmarks on most doing business indicators*. Available at: https://www.worldbank.org/en/news/press-release/2019/10/24/doing-business-2020-oecd-high-income-economies-remain-global-benchmarks-on-most-doing-business-indicators [Accessed: 31 July 2024].

World Bank Group. 2022a. *Financial Inclusion Support Framework (FISF)*. The World Bank. Available at: https://www.worldbank.org/en/topic/financialinclusion/brief/financial-inclusion-support-framework [Accessed: 25 August 2023].

World Bank Group. 2022b. *Global Financial Development Database*. https://www.worldbank.org/en/publication/gfdr/data/global-financial-development-database [Accessed: 16 October 2024].

World Bank Group. 2024a. *Financial inclusion in Sub-Saharan Africa—Overview*. Available at: https://www.worldbank.org/en/publication/globalfindex/brief/financial-inclusion-in-sub-saharan-africa-overview#:~:text=In%2016%20of%20the%2036,percent)%20(figure%201 [Accessed: 28 August 2024].

World Bank Group. 2024b. *Inequality and shared prosperity*. Available at: https://www.worldbank.org/en/topic/isp/overview [Accessed: 14 November 2024].

World Bank Group. 2024c. *Data from the Global Findex 2021: The impact of mobile money in Sub-Saharan Africa*. Available at: https://www.worldbank.org/en/publication/globalfindex/brief/data-from-the-global-findex-2021-the-impact-of-mobile-money-in-sub-saharan-africa [Accessed: 14 February 2025].

World Bank Group. 2025a. *Financial Inclusion: Financial inclusion is a key enabler to reducing poverty and boosting prosperity*. Available at: https://www.worldbank.org/en/topic/financialinclusion/overview [Accessed: 17 August 2025].

World Bank Group. 2025b. *Income share held by highest 10%*. Available at: https://databank.worldbank.org/metadataglossary/world-development-indicators/series/SI.DST.10TH.10 [Accessed: 26 February 2025].

World Development Indicators. 2024. Available at: https://databank.worldbank.org/source/world-development-indicators# [Accessed: 16 October 2024].

World Development Indicators. 2025. Available at: https://databank.worldbank.org/source/world-development-indicators# [Accessed: 16 June 2025].

World Inequality Database. 2023a. *What's new about inequality in the Middle East and North Africa in 2023?* Available at: https://wid.world/news-article/2023-wid-update-mena/ [Accessed: 28 September 2024].

World Inequality Database. 2023b. *Income inequality: Palma ratio (before tax)*. Available at: https://ourworldindata.org/grapher/palma-ratio-s90s40-ratio [Accessed: 23 March 2024].

World Inequality Database. 2024. Available at: https://wid.world/data/ [Accessed: 28 September 2024].

World Inequality Database. 2025. Available at: https://wid.world/data/. [Accessed 28 May 2025].

World Inequality Report. 2022a. *Chapter 2. Global inequality from 1820 to now: the persistence and mutation of extreme inequality*. Available at: https://wir2022.wid.world/www-site/uploads/2021/12/WorldInequalityReport2022_Full_Report.pdf [Accessed: 14 November 2024].

World Inequality Report. 2022b. *Country appendix: glossary*. Available at: https://wir2022.wid.world/category/glossary/ -:~:text=The%20bottom%2050%25%20share%20is,wealth%20lies%20below%20the%20median. [Accessed: 26 February 2025].

World Inequality Report. 2022c. *Global economic inequality: Insights*. Available at: https://wir2022.wid.world/chapter-1/ [Accessed: 18 March 2026].

Xu, Z. 2024. Irregular stock data prediction performance optimisation based on the simple linear interpolation. *In proceedings of the 1st International Conference on E-commerce and Artificial Intelligence (ECAI 2024)*: 398-406.

Yeboua, K. 2024. *Manufacturing*. Published online at futures.issafrica.org. Available at: https://futures.issafrica.org/thematic/07-manufacturing/ [Accessed: 10 September 2024].

Yussuf, Y.C. 2022. Cointegration test for the long-run economic relationships of East Africa community: Evidence from a meta-analysis. *Asian Journal of Economics and Banking*, 6(3): 314-336. doi: 10.1108/AJEB-03-2021-0032 [Accessed: 27 June 2025].

Zhang, Q. & Posso, A. 2019. Thinking inside the box: A closer look at financial inclusion and household income. *The Journal of Development Studies,* 55(7): 1616-1631.

Zins, A. & Weill, L. 2016. The determinants of financial inclusion in Africa. *Review of Development Finance*, 6(1): 46-57.

Appendices

Table 2. 7: African countries with National Financial Inclusion Strategies

Country	With a National Financial Inclusion Strategy Link	No Financial Inclusion Strategy
Angola	Not available in the public domain	
Botswana	Financial Inclusion Strategies Resource Center (worldbank.org)	
Burundi	https://www.afi-global.org/publications/republic-of-burundi-national-financial-inclusion-strategy/#:~:text=Preparing%20the%20National%20Financial%20Inclusion,all%20categories%20of%20the%20population.	
Egypt		formulating
Eswatini	Financial Inclusion Strategies Resource Center (worldbank.org)	
Gambia	Not available in the public domain	
Kenya	Not available in the public domain	
Madagascar	Financial Inclusion Strategies Resource Center (worldbank.org)	
Morocco		formulating
Mozambique	https://thedocs.worldbank.org/en/doc/469371468274738363-0010022016/original/MozambiqueNationalFinancialInclusionStrategy20162022.pdf	
Namibia	Financial Inclusion Strategies Resource Center (worldbank.org)	
Nigeria	Financial Inclusion Strategies Resource Center (worldbank.org)	
Rwanda	Not available in the public domain	
South Africa	https://www.fsca.co.za/Documents/FSCA%20Financial%20Inclusion%20Strategy.pdf	
Sudan		formulating
Tanzania	Financial Inclusion Strategies Resource Center (worldbank.org)	
Tunisia	Not available in the public domain	
Uganda	https://www.afi-global.org/wp-content/uploads/2023/12/Signed_2023_2028_National-Financial-Inclusion-Strategy_1.pdf	

Source: Compiled by the author using information from the World Bank Group and AFI sites.

Note: Algeria, Cameroon, Congo Republic and Mauritius have no information about the National Financial Inclusion Strategies and its formulation at the time this research was conducted.

Table 5. 2: African countries' Gini coefficient by range based on the year 2022

Range of the Gini coefficient	**Countries**
Medium: 40 to 50	Guinea, Mauritania
Moderately high: 51 to 60	Algeria, Burundi, Cameroon, Egypt, The Gambia, Ghana, Kenya, Lesotho, Madagascar, Mauritius, Morocco, Seychelles, Tanzania
High: 61 to 80	Botswana, Congo Republic, Eswatini, Mozambique, Namibia, Rwanda, South Africa, Uganda, Zambia, Zimbabwe

Source: Compiled by the author based on pre-tax Gini coefficient from the World Inequality Database (2025)

Table 6. 24: The list of African countries included in the study

Sub-region	**Country**
North Africa	Algeria, Egypt, Mauritania and Morocco
Southern Africa	Botswana, Lesotho, Madagascar, Mauritius, Mozambique, Namibia, South Africa, Eswatini, Zambia and Zimbabwe
East Africa	Burundi, Kenya, Rwanda, Seychelles, Tanzania and Uganda
West Africa	The Gambia, Ghana and Guinea
Central Africa	Cameroon and Republic of Congo

Source: Classification according to the African Development Bank (2013)