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The Role of Financial Inclusion in Income Inequality, Poverty Reduction & Economic Growth in Developing Countries

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Abstract

This study was conducted to examine the role of financial inclusion in economic growth, poverty, and income inequality in developing countries from 2010 to 2020. A panel data consisting of 101 countries for the period 2010 to 2020 was compiled from the World Development Indicators and the Global Financial Inclusion Database (Global Findex Database). The collected data was analyzed using the System Generalized Method of Moments. The study's findings indicate that financial inclusion has a positive impact on improving economic growth and reducing income inequality in developing countries. However, contrary to existing literature, this study found that financial inclusion has a direct relationship with poverty, which can be attributed to the economic peculiarities of developing countries.

Therefore, this study concludes that financial inclusion contributes to improved economic growth and reduced income inequality. Although it may not directly alleviate absolute poverty, it helps reduce poverty through the mechanisms of income inequality and economic growth. It is recommended that policymakers and regulators in respective countries focus on expanding the scope of financial inclusion to enhance economic growth and reduce income inequality.

Keywords: Financial inclusion, Income inequality, Poverty, System generalized method of moments (GMM).

Introduction

The flow of funds from surplus entities to those in need is one of the main purposes of financial intermediaries. The efficient flow of funds through these intermediaries requires a developed financial system aimed at all segments of society. This results in high economic growth and helps reduce income inequality and poverty. In this regard, banks and other financial service providers are considered the forefront financial intermediaries of the financial systems of an economy. These financial intermediaries

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help channelize funds from surplus entities to those in need and help grow the economy of the country. The same holds true for both developed and developing countries. However, when the majority of the developing world population is unbanked, this claim becomes uncertain (Sharma, 2016a).

According to the latest report from the Global Index Database, 31% or 1.7 billion adults do not have access to a bank account. This unbanked adult population is mostly comprised of the developing world. This means that the majority of the population either lacks awareness about the financial system or the financial products and services, or they don't have access to the financial system. This report has highlighted the major problem of financial exclusion and underscored the need for financial inclusion. Leyshon and Thrift (1995) described financial exclusion as the exclusion of individuals and groups from obtaining entrance to the formal financial system. Sinclair (2001) termed financial exclusion as the failure to obtain basic financial products and services in a suitable form by a group of people. Conroy (2005) stressed that financial exclusion is a process that restricts underprivileged social groups from accessing the formal financial system of their countries. Mohan (2006) declared financial exclusion as the inability of some segments of society to access proper, low-cost, and secure financial products and services.

However, financial exclusion can be voluntary or involuntary. T. Beck, Demirguc-Kunt, and Honohan (2009) reported that voluntary financial exclusion could result from a lack of knowledge about financial products and services or financial institutions. Some financial products and services might not be required due to ethical or religious concerns; non-usage in this case can be termed voluntary exclusion. Involuntary financial exclusion can be due to low income, where commercial financial institutions consider a group of households unbankable due to low income. Secondly, discrimination against certain segments of the population based on religious or ethnic grounds can be the reason for involuntary financial exclusion. The cost of reaching a certain group of the population might be too high for financial service providers. Finally, the financial products and services might be costly for a particular segment of the population. All these reasons for involuntary financial exclusion demand the attention of policymakers in order to achieve a financially inclusive financial system.

Financial exclusion can damage the growth of an economy because it is considered a major hurdle in developing the financial infrastructure of the economy. Thus, financial inclusion is the foundation for a developed and sound financial infrastructure, which, in turn, plays a key role in the economic growth of the country and helps reduce income inequality and poverty (Sharma, 2016a).

The World Bank defines financial inclusion as individuals and businesses having access to useful and reasonably priced financial products and services that meet their

needs for day-to-day transactions, payments, savings, credit, and insurance, delivered in a transparent and sustainable way (Demirgüç-Kunt & Klapper, 2012).

Sarma (2008) defined financial inclusion as a process that ensures the financial system is easily accessible, available, and easily usable by all members of society. This definition stresses several aspects of financial inclusion, such as the financial system being accessible to all members of the economy, available according to the needs of the population, and free from barriers, both priced and unpriced, in its usage.

Demirguc-Kunt, Beck, and Honohan (2008) defined financial inclusion as the absence of price and non-price hurdles in the use of financial products and services. However, this does not mean that every individual and business firm should have access to an unlimited amount of credit and insurance coverage. Access to such services is based on the creditworthiness of the individual and business firms (Demirguc-Kunt, Beck, & Honohan, 2008).

Hannig and Jansen (2010) reported that financial inclusion involves bringing the unbanked segments of the population into the mainstream financial system so that they can have access to a wide range of financial products and services. They emphasized that voluntary exclusion and the presence of risky returns may prevent households and firms from using and offering financial services, respectively.

The importance of financial inclusion is widely acknowledged by policymakers and global regulators. The World Bank has highlighted the significance of basic banking accounts, which serve as the initial step towards an inclusive financial system and provide access to other financial services. Access to transaction accounts is the goal of the World Bank Group's Universal Financial Access 2020 initiative. An inclusive financial system has been recognized as a facilitator of 7 out of the 17 Sustainable Development Goals. The G20 countries have shown dedication to advancing the G20 high-level principles of digital financial inclusion worldwide. The World Bank has also emphasized the achievement of the global goal of Universal Financial Access (UFA) by 2020 ("Financial Inclusion," 2018).

According to the World Bank, an inclusive financial system enables the day-to-day businesses of individuals and business firms. In an inclusive financial system, account holders not only conduct their daily transactions but also utilize other financial services such as insurance and credit, which help them establish and develop their businesses. Financial inclusion allows people to manage their funds for education, healthcare, and financial shocks, thereby improving their overall standard of living.

Sarma (2008) reported that financial inclusion enables households and business firms to organize their useful resources efficiently. Moreover, access to proper financial products and services can significantly help in the everyday management of finances, thereby reducing reliance on informal credit sources, which are often exploitative. An

inclusive financial system enhances societal welfare by facilitating the provision of a wide range of efficient financial services.

Demirguc-Kunt et al. (2008) highlighted that financial inclusion has both direct and indirect consequences on the lives of individuals and business firms. Greater financial deepening provides opportunities for households and business firms to leverage surplus funds and secure themselves.

In various developing economies, financial inclusion, as proposed by the World Bank, is seen as a strategy for enhancing economic growth and alleviating poverty. Although it is not the sole remedy for poverty and income inequality, there is significant evidence from studies supporting the notion that financial inclusion can have a significant effect on enhancing economic growth, lowering income inequality, and reducing poverty.

Recently, academic researchers and policymakers have turned their attention to investigating the effects of financial inclusion and determining its relationship with macroeconomic factors such as economic growth, income inequality, and poverty in order to uncover the truth (Demirguc-Kunt et al., 2008; Hannig & Jansen, 2010).

Objectives of the study

There are three main objectives of the study and they are as follows;

- The foremost objective of the study is determining the role of financial inclusion in economic growth in middle income countries from 2010 to 2020.
- The second objective this study to find the relationship of financial inclusion in reducing poverty in middle income countries from 2010 to 2020.
- The third and final objective of the study is to investigate the impact of financial inclusion in lowering income inequality in middle income countries from 2010 to 2020.

Literature Review

Financial inclusion and Economic growth

Since the early 2000s, the concept of financial inclusion has attracted the attention of researchers and academics. Subsequently, researchers have focused on determining the relationship between financial inclusion and various other economic variables such as economic growth, income equality, and poverty. To achieve this, several studies have been conducted.

For instance, Kularatne (2002) investigated the role of financial deepening in long-term economic growth in South Africa over the period of 1954-1992. The study developed two different models and employed the Johansen VECM structure. The

first model examined the direct and indirect effects of the financial system on per capita output through the investment rate. The second model investigated the feedback effects between the financial and real sectors. The study found that financial deepening enhances economic growth in South Africa. However, the use of larger datasets was recommended to ensure robust results.

Similarly, Calderón and Liu (2003) attempted to determine the direction of causality between financial development and economic growth. The study employed the Geweke decomposition test on data from 109 developing and industrial countries spanning the period from 1960 to 1994. The results showed that efficient financial deepening leads to high economic growth. The study revealed a coexistence of causality between financial development and economic growth, indicating that financial deepening contributes to a prosperous economy, while high economic growth drives financial development. The study emphasized the policy implications of increased economic liberty and a liberalized financial system for a prosperous economy.

Agbetsiafa (2004) furthered the debate on the nexus between finance and growth by using proxies more closely related to financial inclusion and financial deepening. The study utilized co-integration tests on data from eight emerging economies in sub-Saharan Africa. The study concluded that financial development and economic growth are co-integrated, calling for additional measures of financial inclusion and financial deepening to further enhance economic growth. Similarly, Valverde and Fernández (2004) also confirmed through their study that financial deepening leads to an increase in economic growth.

Financial inclusion and Income Inequality

After reviewing the literature on the relationship between financial inclusion and economic growth, studies have also been conducted to examine the impact of financial inclusion on income inequality (Burgess & Pande, 2005).

Burgess and Pande (2005) assert that the lack of access to finance is one of the reasons why the poor remain poor. The authors conducted an empirical study on this issue and reported that between 1977 and 1990, the opening of more rural bank branches resulted in a significant reduction in rural poverty and an increase in nonagricultural productivity. This study clearly demonstrates that ensuring access to finance, which is one of the determinants of financial inclusion, helps reduce poverty and promotes equitable distribution of income and opportunities.

Similarly, Liang (2006) claims that financial development has had a strong effect on income distribution in China. The study utilized provincial data from 1986 to 2000 and analyzed it using the Generalized Method of Moments technique. The study yielded results indicating that financial development has helped reduce income

inequality in urban China following financial reforms. The study recommends implementing more effective reforms in the financial sector to accelerate the just distribution of income throughout society.

Furthermore, Claessens and Perotti (2007) identified inequality as an unequal approach to opportunities, a concept that has been underscored in recent evidence. Their paper explores the relationship between finance and income inequality. The authors argue that a better-developed financial system can indirectly reduce income inequality by promoting economic growth. However, ensuring efforts are made to increase access to financial services for everyone will support equal distribution of income and provide equal growth opportunities.

Financial Inclusion and Poverty

Several researchers and economists have focused their attention on analyzing financial inclusion and its role in reducing poverty. Aderibigbe (2001) examined the role of the financial sector and the challenges it faces in poverty alleviation. The author asserted that lack of access to credit facilities is a major cause that hinders poverty alleviation. The study highlighted community-based projects that address the needs of the community. Additionally, the study recommended embracing UNDP strategies, with access to financial services as a central point for poverty reduction in Nigeria. The study concluded by suggesting the provision of feasible and accessible financial services in the area for everyone, and emphasized the role of commercial banks in reaching out to lower-income individuals to mobilize their savings and help stabilize their income.

Similarly, Jalilian and Kirkpatrick (2002) investigated the relationship between financial development, economic growth, and poverty reduction in developing countries. The results from cross-country analysis revealed that financial sector development helps reduce poverty through economic growth. The study concluded by recommending further empirical research on the link between financial sector development and poverty reduction using more micro-level measures, in order to achieve the objective of poverty reduction in lower-income countries.

Additionally, Matin, Hulme, and Rutherford (2002) examined existing literature with the objective of delivering and designing better financial products for the poor. The authors reported numerous opportunities to develop and innovate financial products to assist the poor. The study emphasized that financial products and services help the poor mobilize their savings for a wide range of needs. However, the study noted the importance of delivering financial products and services in a timely and affordable manner to facilitate poverty alleviation.

On the other hand, Weiss, Montgomery, and Kurmanalieva (2003) conducted a review of the existing literature on the impact of microfinance on poverty. The study

acknowledged that many studies have already assessed the relationship, but questions remain regarding how microfinance helps people escape poverty and whether it is cost-effective in poverty alleviation. The authors attempted to address these questions in their study. The review concluded that although microfinance is helpful in reducing poverty, it is not the sole solution for poverty reduction in any region. The study emphasized the need for efforts to ensure proper outreach of microfinance activities to the poor, along with risk assessment of the poor clients.

Furthermore, Honohan (2004) examined the relationship between financial development, economic growth, and poverty. Through cross-country regression analysis, the study found a negative relationship between financial depth and the headcount ratio of poverty. This implies that a more developed financial system is associated with a lower number of people in poverty. The study also highlighted the significance of financial development for sustainable economic growth. It can be clearly inferred from the study that financial development indirectly contributes to poverty reduction. The paper called for more indicators of financial development to empirically test the association.

Data and Methodology

The study employed the System Generalized Method of Moments (GMM) estimation technique, which is a relevant methodology that facilitates the analysis of research objectives in a tentative manner while enhancing the reliability and validity of findings. The study aims to examine the impact of various explanatory variables and indicators of financial inclusion on dependent variables, such as economic growth, income inequality, and poverty. Through a comprehensive analysis of these factors and their interdependencies, the research aims to contribute to the existing literature on the topic and provide a better understanding of the relationships between financial inclusion and economic development.

Population

The term "population" in research refers to the complete set of people, events, services, households, or groups of objects that are the focus of investigation (Ngechu, 2006). As highlighted by Mugenda, the population is similar to a census, as each constituent element holds an equal probability of being included in the final sample. This conceptualization of population serves as a cornerstone of research, providing a means to delineate the boundaries and range of the study and establish a framework for the generalization of findings.

The target population for this study consists of middle-income countries specified by the UN and The World Bank. There are a total of 101 middle-income countries in our sample. These countries were selected because, according to the World Bank, they are relatively critical drivers of the world economy. The sustainable economic growth and

development in these middle-income countries provide encouraging spillover effects to the rest of the world in terms of poverty reduction, international financial stability, and international trade.

Middle-income countries face various challenges such as financial literacy, poverty, social and income inequality, education, trade, tax policy, and urbanization. Similarly, these countries may have different factors affecting economic growth and various causes of poverty and income inequality due to differences in the basic structure of economic and political institutions compared to high-income countries.

Moreover, middle-income countries include all emerging economies except Russia, which is a high-income country. Concentrating on this specific group of countries may potentially reduce the problem of heterogeneity.

Therefore, studying financial inclusion and its effects on economic growth, poverty, and income inequality from the perspective of middle-income countries, which share similar economic characteristics, will have significant importance for both policymakers and researchers.

Sample design

This dissertation has utilized a panel sample from the period of 2004-2016 comprising selected middle-income countries. The selection of countries is purely based on the availability of data.

According to Hsiao (2007), panel data have several advantages over cross-section and traditional time series data. Panel data contain multiple data points, which provide a sufficient degree of freedom and help reduce the chances of endogeneity and multicollinearity among exogenous variables. This also leads to more efficient parameter estimation.

Data collection

In order to analyze the research objectives, this study utilizes secondary data on a yearly basis. The secondary data includes published material collected from the World Development Indicator (WDI) and the Global Financial Inclusion database. According to Cooper, Schindler, and Sun (2006), secondary data is particularly useful in quantitative techniques for evaluating reports, records, government opinions, and government documents. This study employs annual panel data. Data on economic variables such as economic growth, poverty, income inequality, unemployment, secondary school enrollment, population growth rate, inflation, and trade are accessed from the WDI (World Development Indicator). Data on bank branches, depositors, debit cards, accounts, borrowers, and life insurance are obtained from the Global Financial Inclusion database.

Variables description

This section covers the construction of dependent and independent variables, as well as their measures and proxies used, and explores the linkages that determine the impact of various Financial Inclusion Indicators on Economic Growth, Income Inequality, and Poverty.

First, the dependent variables—Economic Growth, Income Inequality, and Poverty—are described, followed by a description of the independent variables, such as indicators of Financial Inclusion.

Economic growth

Samuelson and Nordhaus (1995) described economic growth as the increase and growth of a country's potential GDP or national output. Technically, economic growth occurs when the production possibility frontier (PPF) shifts outward. Economic growth takes place when there is an increase in output per person in an economy, leading to improved living standards for the people of the country. Many countries are interested in the growth in per capita output because it results in higher average incomes and improved living standards.

Gross Domestic Product (GDP) is considered the most comprehensive measure of the total economic output of an economy. GDP represents the value of all goods and services produced in an economy during a one-year period, measured in US dollars. When calculating the dollar value of an economy's output, market prices are used, which can change due to inflation, making it challenging for economists to determine the real value of the total output. To address this issue, GDP is divided into two types: Nominal GDP and Real GDP.

Nominal GDP represents the total output of an economy at current market prices. On the other hand, Real GDP measures the total output of an economy at constant prices and is adjusted for inflation. Real GDP is used to account for the effects of price changes.

In line with previous research studies like D.-W. Kim et al. (2018), J.-H. Kim (2015), and others related to economic growth, this study utilizes GDP growth rate as a proxy measure for economic growth.

Income inequality

Peterson (2017) described income inequality as a measure that reflects an individual's or a group's relative position in society in relation to their income. Sarlo et al. (2017) explained economic inequality as the variation in living standards among individuals,

households, regions, and countries. Living standards can be understood in various ways, but the most commonly used proxy measure is income. The authors argued that one common approach to assessing inequality is by examining income differences between individuals, households, and regions, which is referred to as income inequality.

The Gini coefficient is the most widely used measure of income inequality, and it can be explained with the help of the Lorenz curve. The Lorenz curve represents the percentage of total income received by the population and the percentage of the total population. In a scenario of perfect income distribution, the poorest 25% of the population would receive 25% of the total income, the poorest 60% would earn 60% of the total income, and so on. In this case, the Lorenz curve would coincide with the 45-degree line. However, in the presence of inequality, the Lorenz curve will deviate from the 45-degree line, indicating that income is not equally distributed among the population. For example, the poorest 50% of the population might receive only 20% of the total income, and the poorest 25% might receive just 10% of the total income, and so on.

This study utilizes the Gini Index, similar to the studies of Baiardi and Morana (2017), Denk and Cournède (2015), and Jauch and Watzka (2016), which is estimated by the World Bank, as a proxy measure for income inequality in middle-income countries from 2004 to 2016.

Poverty

Poverty is a global phenomenon and is closely associated with economic deprivation. The meaning and definitions of poverty vary depending on the context in which it is discussed. From an income perspective, a person is considered poor when they fail to meet the maximum income level set by their country. For example, the international poverty standard is earning less than $1 per day. From a material perspective, poverty is characterized by a lack of access to an adequate amount of food, clothing, and shelter. Poverty can also encompass a lack of capabilities, opportunities, and social respect within society (Akindola, 2009; Chambers, 2006; Wagle, 2002).

The Headcount Index is a measure that quantifies the proportion or percentage of the population whose income is equal to or below the poverty line. If x represents the number of households or individuals with income at or below the poverty line in a population of y, the headcount index, denoted as z, is calculated as x/y. This is a straightforward measure of poverty that is easily understandable and communicable. It is also useful for making comparisons between different groups or countries and assessing progress in poverty alleviation over time.

For this study, the author has utilized the Headcount Index provided by the World Bank in the World Development Indicators, similar to previous literature, including studies by Boukhatem (2016), Kappel (2010), and Williams et al. (2017).

Financial inclusion

This section will provide a brief description of the proxy measures related to financial inclusion or the indicators of financial inclusion that have been utilized by various prominent researchers, such as Thorsten Beck, Demirgüç-Kunt, and Honohan (2009); Demirguc-Kunt et al. (2018); Sarma (2008, 2016). Therefore, in line with the aforementioned literature, this study has employed the following indicators to measure financial inclusion.

1. Account numbers at formal financial institutions (%, age 15+) (Account Penetration). This measure simply represents the number of the adult account holders at a formal financial institution. This will tell us about the penetration of a financial product of a formal financial institute.
2. Borrowers from financial institutions in the past year (%, age 15+) (Credit). This study has used borrowers from commercial banks per 1000 adults as a proxy for credit measure in financial inclusion It shows the credit of individuals in financial institutions, a high level of it means the sound financial transactions of individuals and also means a high level of credit from the financial institution.
3. Bank Branches per 100,000 adults. (Penetration rate of financial institutions). This measure will represent the number of formal financial institution in the country which will show how much financial institute has penetrated in the area to offer financial products and services.
4. Depositor with commercial bank per 1000 adults as proxy for saving (the degree of how many people open savings accounts in financial institutions)
5. As one of the most vital financial services for managing risk and maintaining an individual's financial stability, life insurance plays a crucial role in safeguarding against unpredictable events such as accidents, illness, and death. To gauge the level of insurance coverage in a given economy or region, the ratio of life insurance premium volume to GDP can serve as a credible proxy for life insurance. This ratio provides a useful measure of the prevalence of insurance and enables policymakers and researchers to obtain valuable insights into the financial security of households and individuals. The resulting data can be used to inform decision-making processes and shape policies aimed at improving financial stability and reducing vulnerability to risks.

Control variables

In order to capture a true picture of the role of Financial Inclusion in Economic Growth, Income Inequality and Poverty, this study have used a set of control variables for panel dynamic regression like Population Growth Rate, Inflation Rate, Secondary School Enrolment, Percentage of Trade Volume to GDP and Unemployment Rate. These set of control variables have been widely used in the previous studies of (D.-W. Kim et al., 2018; J.-H. Kim, 2016; Neaime & Gaysset, 2018). Therefore, this study too consistent to the literature will use the same set control variables.

Table 1: Summary of Expected Relationship Between Financial Inclusion Variable, Economic Growth and Macroeconomic Variables.

Variables	Description/ Proxy	Expected Effect	Research Support	Data Source
Financial inclusion	Accounts, Borrowers, Bank branches, Depositors, Life Insurance.	Positive	World bank, Sarma 2008), Demirguc-kunt et al. (2008), Ghosh (2011)	WDI, World bank.

Table 2: Expected Relationship Between Income Inequality and Financial Inclusion Variables.

Variables	Description/ Proxy	Expected Effect	Research Support	Data Source
Financial inclusion	Accounts, Borrowers, Bank branches, Depositors, Life Insurance	Negative	Honohan (2008),J.-H. Kim (2016),Neaime and Gaysset (2018)	WDI ,World Bank.

Table 3: Summary of Expected Relationship between Poverty and Financial inclusion measures.

Variables	Description/ Proxy	Expected Effect	Research Support	Data Source
Financial inclusion	Accounts, Borrowers, Bank	Negative	Burgess and Pande (2005),T. Beck, Demirguc-Kunt, and	WDI ,World Bank.

	branches, Depositors, Life Insurance		Honohan (2009),Kappel (2010),Pal and Pal (2014),Park and Mercado (2015),	

Analytical Framework

The main objectives of the study are to investigate the role of financial inclusion in economic growth, income inequality and poverty. Therefore, this study has set of empirical models that are based on theoretical background and set of econometric techniques to estimate these models.

Financial Inclusion and Its Role In Economic Growth, Income Inequality And Poverty

This study is based on the theoretical and research work put forward by The world bank through its various annual research studies related to financial inclusion, the research studies by (Thorsten Beck, Demirgüç-Kunt, et al., 2007; Thorsten Beck, Demirguc-Kunt, et al., 2007; Demirguc-Kunt et al., 2008; Demirgüç-Kunt & Klapper, 2012; Hossain & Knight, 2008; J.-H. Kim, 2016; Levine, 2008; Neaime & Gaysset, 2018). These studies provided different array of models to investigate the role of Financial inclusion in effecting the macroeconomic conditions like economic growth and development, income inequality and poverty. However this study has adopted the econometric model of Neaime and Gaysset (2018). The general econometric model will look like the following.

$$Z_{it} = \alpha_i + \sum_{j=1}^{p} \varphi_j Z_{it-1} + \sum_{j=1}^{N} \gamma_j X_{jit} + \sum_{k=1}^{L} \beta_k Y_{kit} + \varepsilon_{it},$$

Where Z_{it} refers to the dependent variables in the model and they are Economic Growth, Income Inequality and Poverty respectively. Z_{it-1} refers to the lagged values of our dependent variables. X_{it} refers to the measures of financial inclusion and Y_{it} presents set of control variables like population growth rate, inflation, secondary school enrolment, trade and unemployment. The α represents country specific unobserved factors and ε represent the error term.

Model Specification

This study considers a set of five explanatory variables and a set of five control variables that vary across countries over a period of time. For this form of analysis, panel data methodology is used. Panel data provides more effective information by combining time series and cross-sectional observations. It also offers greater degrees

of freedom, increased variability, and reduced multicollinearity between variables. Compared to time series and cross-sectional data, panel data provides more comprehensive empirical results and analysis. Therefore, to estimate the role of financial inclusion in economic growth, income inequality, and poverty, the present study employs dynamic panel data models for Economic growth, Income Inequality, and poverty. This model incorporates lagged dependent variables in the system of equations to control for the dynamics of the process. Many recent studies, such as Neaime and Gaysset (2018), J.-H. Kim (2016), and D.-W. Kim et al. (2018), have followed this approach to investigate the role of financial inclusion. The following specification is based on a dynamic panel data model to examine the role of financial inclusion measures in economic growth, income inequality, and poverty.

$$GDP_{it} = \beta GDP_{it-1} + \gamma' FI_{it} + \delta C_{it} + v_{it} + \epsilon_{it} \quad \ldots\ldots\ldots\ldots \quad (3.2)$$

$$GINI_{it} = \beta GINI_{t-1} + \gamma' FI_{it} + \delta C_{it} + v_{it} + \epsilon_{it} \quad \ldots\ldots\ldots\ldots \quad (3.3)$$

$$Poverty_{it} = \beta Poverty_{t-1} + \gamma' FI_{it} + \delta C_{it} + v_{it} + \epsilon_{it} \quad (3.3)$$

(General equations)

Where

GDP_{it} = is the measure of Economic growth for ith country of time period,t.

GDP_{it-1} = is the lag of the dependent variable of Economic Growth.

$GINI_{it}$ = is the value of income inequality of ith countries for the time period t.

$GINI_{it-1}$ = is the lag of the dependent variable of income inequality.

FI_{it} = is the log values measures of financial inclusion of ith countries for the time period.

C_{it} = is the set of control variable

v_{it} = fixed effect of ith country in time period t.

ϵ_{it} = stands for i.i.d error term

Where $v_{it} = \delta_i + \mu_{it}$

Since GDP_{it} depends on unobservable time invariant individual effect δ_i that's why its lag variable GDP_{it-1} will also be correlate with δ_i. This means GDP_{it-1} is endogenous and we will face so-called dynamic panel data bias when estimating coefficient using OLS technique. The co efficient may be upward or downward biased depending on the relationship between lag dependent variable, GDP_{it-1} and δ_i. The coefficient will be upward biased if the two regressors are positively related to each other.

To remove country specific or any time invariant country specific variable and endogeneity that may be due to the correlation between GDP_{it-1} and v_{it}, Arellano and Bond (1991) developed GMM technique. Whereas, first differencing remove v_{it} country specific effect and produce the equation that may be estimated for explanatory variables.

$\Delta GDP_{ti} = \Delta\beta_o GDP_{it-1} + \Delta\gamma' s\ FI_{it} + \Delta\delta C_{it} + \Delta\epsilon_{it}$….3.4
$\Delta GINI_{ti} = \Delta\beta_o GINI_{it-1} + \Delta\gamma' s\ FI_{it} + \Delta\delta C_{it} + \Delta\epsilon_{it}$….3.5
$\Delta Poverty_{ti} = \Delta\beta_o Poverty_{it-1} + \Delta\gamma' s\ FI_{it} + \Delta\delta C_{it} + \Delta\epsilon_{it}$….3.6
Where $i = 1$ ……,N, $t = 1$,……T_i
Cit represent the set of macroeconomic variable While $\boldsymbol{\beta_i}$,$\boldsymbol{\gamma_i}$,$\boldsymbol{\delta_i}$ are the parameter to estimate using GMM technique.

Econometric Methodology

Types of panel models

There are various types of panel data estimation techniques like pooled OLS, Fixed effect model and Random effect model, IVLS, PCSE, FGLS and GMM etc.

Estimation technique

Since our study is based on annual panel data, which has a time series dimension, we have used the estimation technique that is best and frequently used for panel data. The most commonly used models, such as the fixed effects model (FEM), random effects model (REM), and pooled OLS, are used to estimate the coefficients of variables. However, these methods face a problem in providing efficient and consistent estimates in the presence of potential endogeneity caused by reverse causality. In such situations, the best available option is to use the Two Stage Least Squares (2SLS) technique. However, in the presence of heteroscedasticity, 2SLS does not provide efficient estimates, which may affect the significance pattern of the parameter estimates. Additionally, 2SLS is a static technique that does not allow for including the lag of the dependent variable as a regressor to correct for the problem of autocorrelation.

A prominent econometric technique to address the aforementioned problems of endogeneity, reverse causality, heteroscedasticity, and autocorrelation is the Generalized Method of Moments (GMM). GMM is an extension of the Instrumental Variable (IV) technique. The basic advantage of the GMM approach is that the model to be estimated does not necessarily need to be homoscedastic and serially independent (Blundell & Bond, 2000). Thus, GMM produces consistent and efficient estimates even in the presence of heteroskedasticity (Perera & Lee, 2013). For dynamic panel data modeling, GMM has been primarily used by Arellano and Bond (1991), followed by Arellano and Bover (1995). Later, Blundell and Bond (2000) specifically used GMM to address the problem of endogeneity in the production function. To avoid the problems of endogeneity and reverse causality, this study favors the use of the system GMM technique.

Results and Discussions

Descriptive Statistics Analysis

This section consists of descriptive statistics of Financial Inclusion Variables, Economic Growth and Income Inequality. Additionally, it also presents summary statistics of our control variables which are shown here in table 4.

Table 4: Summary Statistics.

Variables	**Obs.**	**Mean**	**St.Deviation**	**Min.**	**Max.**	**Skew**	**Kurtosis**
Year	1313	2010	3.743	2004	2016	0	1.785
Country	1313	51	29.165	1	101	0	1.79
Eco. Growth	1313	4.694	6.612	-62.07	123.139	4.98	98.71
Inc. Inequality	1313	13.538	19.70476	16.2	64.8	0.914	2.133
Poverty	1313	2.561	7.021113	0	64.4	4.566	29.271
Accounts	1313	4.311	14.333	0.404	92.280	3.67	16.40
Borrowers	1313	75.495	129.083	0.629	872.807	2.60	11.89
Depositors	1313	441.682	523.263	0.368	3379.808	1.55	6.68
Bnk.Branches	1313	13.457	13.090	0.486	92.173	1.99	9.56
Life Insuranc	1313	.6367	1.439	0	12.220	4.56	28.94
Inflation	1313	6.131	10.128	-18.10	254.948	13.35	294.72
Population	1313	1.342	1.175	-1.666	9.109	0.68	5.39
Unemployment	1313	8.356	7.124	0.1599	38.04	1.31	4.73
Sec.School Enr.	1313	8.356	7.124	18.747	126.054	-0.28	1.44
Trade	1313	80.413	39.127	0.167	245.996	-0.05	3.14

The table of descriptive statistics shows that all middle-income countries grow with a mean of around 4.694 and a standard deviation of 6.612.

The financial inclusion variable "Accounts," which measures the percentage of account holders at a formal financial institution, has a mean of 4.311 and a standard deviation of 14.33. The statistics related to the measure of borrowers, representing the usage of formal financial institutions for credit purposes, have a mean of 75.495 and a standard deviation of 129.083. The mean of the variable "Depositors," used to measure the number of depositors per 1000 adults, is 441.68, while its standard deviation is 523.263. The mean of the "Bank branches" variable shows that there are 13.457 bank branches per 100,000 adults, with a variation of 13.090.

Similarly, the descriptive statistics related to income inequality reveal that the mean Gini index of middle-income countries is 13.538, with a standard deviation of 19.704. The descriptive statistics of poverty show that, on average, there is a poverty headcount ratio of 2.56, with a standard deviation of 7.02.

Correlation Matrix

In the pursuit of examining the presence of multicollinearity within the model, the ensuing table exhibits the intercorrelations between the independent variables. Multicollinearity, which may lead to the inefficiency of parameter estimates and the development of large standard errors, has the potential to threaten the dependability and validity of the results. Furthermore, the integration of numerous independent variables with substantial correlation may not provide supplementary information to the model and may obscure the authentic influence of each variable on the dependent variable. Thus, it is crucial to identify and mitigate the issue of multicollinearity to guarantee precise and resilient findings (Andersen, 2008). Hair, Black, Babin, Anderson, and Tatham (2006) argued that correlation coefficient below 0.9 may not cause serious multicollinearity problem. However Malhotra (2007) stated that multicollinearity problems exists when the correlation coefficient among variables be greater than 0.75. Hence, Correlation of each variable with itself gives the value of 1. The higher values indicate higher correlation the lower value specifies lower correlation.

The first table show the correlation matrix of our Economic growth model, the 2nd table show the correlation matrix of our Poverty model while the 3rd table shows the correlation matrix of our income inequality model. It can be witnessed in all of our three models that none of the variables exceeds the correlation of 0.75 with any other variable. This indicates that no such problem of multi collinearity exists among our explanatory variables in all of the three models. As Malhotra

(2007) identified that multi-collinearity problems can be serious when the correlation coefficient among variables is greater than 0.75.

Table 5: Correlation Matrix Model 1, Economic Growth.

	Eco.Growth	Accounts	Borrowers	Depositors	Bnk.Branch	Life.Insurance	Inflation	Population	Unemployment	Sec.School Enrol.	Trade
Eco.Growth	1										
Accounts	-0.0205	1									
Borrowers	-0.0569	0.1633	1								
Depositors	-0.1054	0.1370	0.3446	1							
Bnk.Branch	-0.1003	0.1184	0.2843	0.2668	1						
Life Insurance	-0.0423	0.0705	0.0163	0.0980	-0.0288	1					
Inflation	-0.0034	0.0323	-0.0724	-0.0018	-0.0666	-0.0445	1				
Population	0.1491	-0.0443	-0.0970	-0.1343	-0.3096	-0.0777	0.0386	1			

Unemployment	-0.0469	0.0356	0.1295	0.1503	0.1284	0.2176	-0.0040	-0.0706	1	
Sec.School.Enrl	-0.902	0.0737	0.1432	0.1721	0.3000	0.0993	0.0186	-0.3094	0.0710	1
Trade	-0.0459	0.0153	0.0492	0.1112	0.1117	0.0528	-0.0702	0.0212	0.0418	-0.0894	1

Table 6: Correlation Matrix of Model 2 Poverty.

	Poverty	**Accounts**	**Borrowers**	**Depositors**	**Bnk.Branch**	**Life.Insuran**	**Inflation**	**Population**	**Unemployment**	**Sec.School Enrol.**	**Trade**
Poverty	1										
Accounts	-0.0257	1									
Borrowers	0.0161	0.1633	1								
Depositors	-0.0346	0.1370	0.3446	1							

Bnk.Branch	-0.0981	0.1184	0.2843	0.2668	1						
Life Insurance	0.0289	0.0705	0.0163	0.0980	-0.0288	1					
Inflation	0.0139	0.0323	-0.0724	-0.0018	-0.0666	-0.0445	1				
Population	0.0607	-0.0443	-0.0970	-0.1343	-0.3096	-0.0777	0.0386	1			
Unemployment	-0.0059	0.0356	0.1295	0.1503	0.1284	0.2176	-0.0040	-0.0706	1		
Sec.School. Enrl	-0.0194	0.0737	0.1432	0.1721	0.3000	0.0993	0.0186	-0.3094	0.0710	1	
Trade	-0.0413	0.0153	0.0492	0.1112	0.1117	0.0528	-0.0702	0.0212	0.0418	-0.0894	1

Volume 2, No. 2 / Jul-Dec 2021

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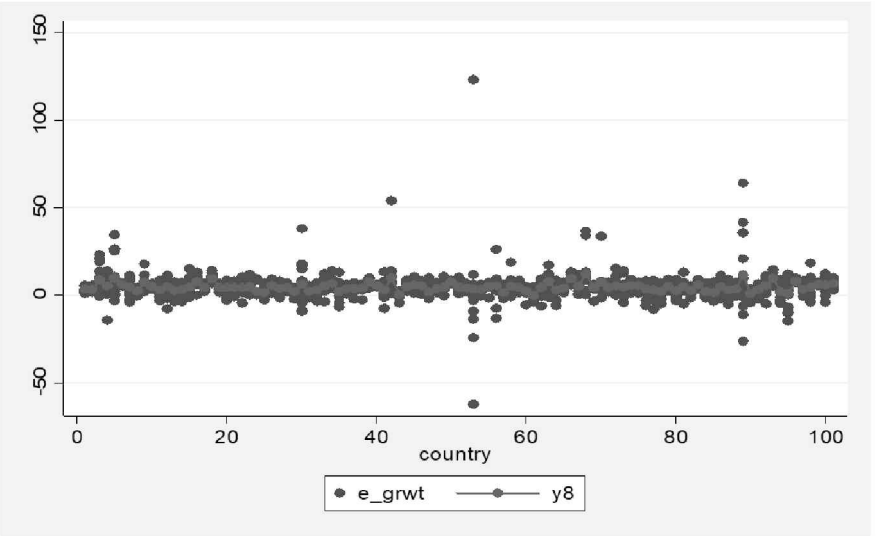
Table 7: Correlation Matrix of Model 3, Income Inequality.

	Inc.Inequality	**Accounts**	**Borrowers**	**Depositors**	**Bnk.Branch**	**Life.Insuranc**	**Inflation**	**Population**	**Unemployment**	**Sec.School Enrol.**	**Trade**
Inc.Inequality	1										
Accounts	0.0999	1									
Borrowers	0.2764	0.1633	1								
Depositors	0.1442	0.1370	0.3446	1							
Bnk.Branch	0.1018	0.1184	0.2843	0.2668	1						
Life Insuranc	-0.0095	0.0705	0.0163	0.0980	-0.0288	1					
Inflation	0.0146	0.0323	-0.0724	-0.0018	-0.0666	-0.0445	1				

Population	-0.1586	-0.0443	-0.0970	-0.1343	-0.3096	-0.0777	0.0386	1		
Unemployment	-0.0268	0.0356	0.1295	0.1503	0.1284	0.2176	-0.0040	-0.0706	1	
Sec.School.Enrl	0.2234	0.0737	0.1432	0.1721	0.3000	0.0993	0.0186	-0.3094	0.0710	1
Trade	0.0176	0.0153	0.0492	0.1112	0.1117	0.0528	-0.0700	0.0212	0.0418	-0.0894	1

Test of Heterogeneity of Economic Growth (Cross Sectional)

The graphs below show the visual inspection of cross-sectional heterogeneity analysis across the group (cross sections) of selected nations from middle-income countries. The red line represents the mean value of economic growth, while the blue dots represent the value of economic growth for each nation. The movement of the red line, with its ups and downs, indicates the presence of cross-sectional heterogeneity to some extent. However, on average, the cross-sectional heterogeneity is minimal. If the red line is straight, it indicates the absence of cross-sectional heterogeneity. Since we have 101 different nations from these middle-income countries, the size of economic growth varies on average in each country compared to others, but the difference is minor.



Graph Shows Heterogeneity (Cross section)

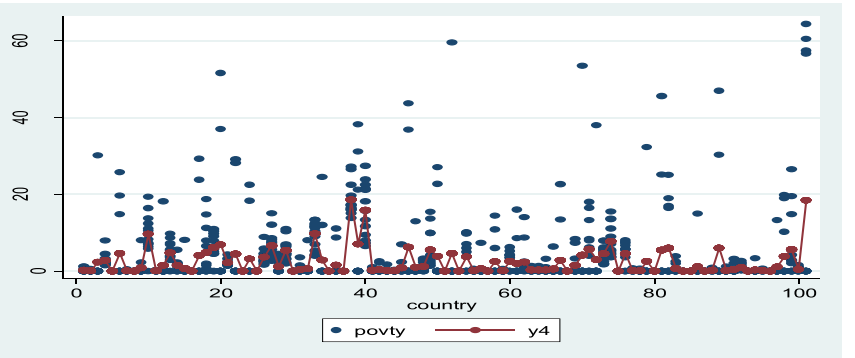
Test of Heterogeneity of Economic Growth (Overtime)

Now, we have examined heterogeneity over a period of time. It is possible that each nation may have a different value of economic growth over different periods of time. The graph below demonstrates that, on average, every country from the middle-income countries has a distinct value of economic growth over varying time periods.

Graph shows Heterogeneity (Over Time Period)

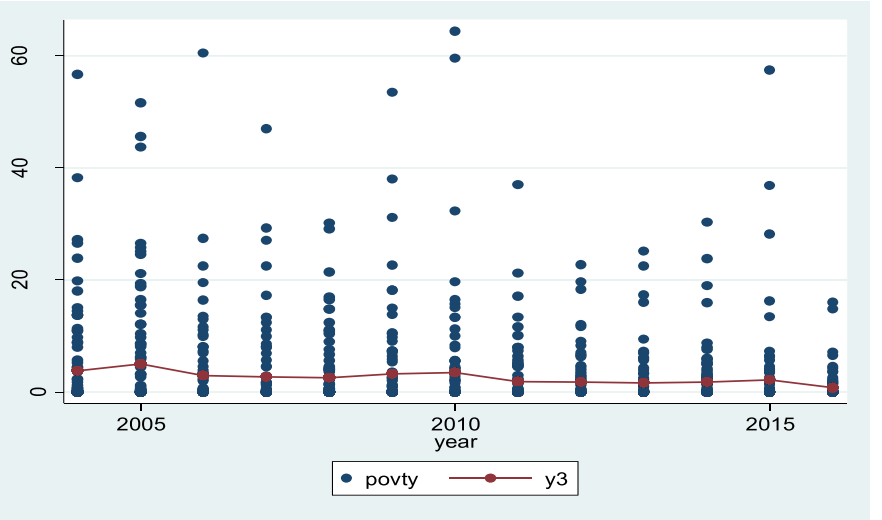
Test of Heterogeneity of Poverty (Cross Sectional)

The graphs below show the visual inspection of cross-sectional heterogeneity analysis over a group (cross sections) of selected nations from middle-income countries. The red line represents the mean value of the poverty measure, i.e., the poverty headcount ratio, while the blue dots represent the value of poverty (poverty headcount ratio) for each nation. The movement of the red line indicates the presence of cross-sectional heterogeneity. If the red line is straight, then there is no cross-sectional heterogeneity. Since we have 101 different nations from these middle-income countries, the level of poverty varies significantly from one country to another.



Test of Heterogeneity of Poverty (Overtime)

Now, we have examined the heterogeneity of poverty over a period of time. There is a possibility that every nation may have a different level of poverty during different periods of time. The graph below shows that, on average, each country from the middle-income countries has a varying level of poverty over different time periods.



Estimation Results and Discussions

This section covers the empirical analysis of the role of Financial Inclusion In Economic Growth, Income Inequality and Poverty. The estimation of the study is divided into 3 models. The model no.1 explain the role of financial inclusion in economic growth while model 2 and model 3 estimate the effect of financial inclusion in income inequality and poverty respectively.

Effect of Financial Inclusion Variables on Economic Growth

To investigate the effect of macroeconomic variables on fiscal deficit, the following results associated with macroeconomic variables are given in the following table. We did some econometric data tests pre-estimating models using GMM techniques.

Table 8: Effect effect of financial inclusion variables on economic growth

Variables	*Coefficients*	*Standard Errors*	*P values*
Lag Eco.Growth	***0.4453196***	***0.0391242***	***0.000****
Accounts	***0.0175432***	***0.0061954***	***0.006****
Borrowers	***0.002302***	***0.0015875***	***0.150***
Depositors	***0.0012323***	***0.0004957***	***0.015****
Bnk.Branch	***0.1013903***	***0.0207981***	***0.000****
Life Insuranc	***0.4620676***	***0.2312168***	***0.048****
The Arellano-Bond AR (1) of serial correlation	$z = -0.78$ $Pr > z = 0.435$		
Sargan-Hansan test of (Over identification)	$chi^2(123)=2491.29$ $Prob>chi^2 = 0.000$		
Sargan test for (Endogenity)	$chi^2(61)=86.98$ $Prob>chi^2 = 0.016$		
No. of Observation	***1212***		

- *GMM estimates.*
- *Robust standard errors are given*
- *Arellano- Bond AR (1) test is for instruments validity under the null hypothesis that instruments are valid.*
- *Hansen test used for exogeneity under the null hypothesis that instrument as a group are exogenous.*
- *Statistical significance at 1%, 5% and 10% are denote by *, ** and *** respectively.*

The results of the study indicate that all the indicators of financial inclusion variables are highly significant at a 5% significance level, except for the variable of borrowers, which represents the number of account holders using their accounts for credit purposes. All the variables have a significantly positive impact on economic growth.

The financial inclusion measure, accounts, representing the percentage of adult account holders at a formal financial institution, has a positive effect on economic growth. On average, a 1% increase in adult account holders leads to a 1.754% increase

in economic growth. This suggests that having a bank account with a formal financial institution contributes to wealth accumulation, thereby boosting the country's economic growth, all else being equal.

The depositor indicator of financial inclusion, measuring the number of depositors or the number of adults per 1000 adults with bank accounts for savings or depositing surplus money, is also positively and significantly related to economic growth. On average, holding other factors constant, a 1.00 increase in the number of depositor account holders per 1000 adults leads to a 1% growth in the economy. This can be justified by the fact that surplus money in banks is utilized by those in need, which can contribute to economic growth.

Furthermore, the risk management factor of an individual, as measured by the financial inclusion variable, significantly affects economic growth in a positive manner. On average, a 1% increase in the premium to GDP ratio results in a 46.20% boost in economic growth, while holding other variables constant. This highlights that an increase in the usage of formal financial products and services for productive purposes can ultimately lead to economic growth.

Effect of Financial Inclusion Variables on Income Inequality Model 02

This section cover the estimation results of our empirical model which shows the role of financial inclusion in poverty reduction which is represented by our Model No.2 in our analysis. The results are given in the following table.

Table 9: Effect of Financial Inclusion Variables on Income Inequality Model 2.

Poverty	*Coefficients*	*Standard Errors*	*P values*
Poverty D2	***0.1704822***	***0.0095168***	***0.000****
Accounts	***0.0049887***	***0.0105624***	***0.637***
Borrowers	***0.0027428***	***0.001208***	***0.023****
Depositors	***0.0006621***	***0.0002875***	***0.021****
Bnk.Branch	***0.0370994***	***0.0101857***	***0.000****
Life Insuranc	***0.5514003***	***0.0969549***	***0.000****
The Arellano-Bond AR (1) of serial correlation	$z = -1.16$ $Pr > z = 0.245$		
Sargan-Hansan test of (Over identification)	$chi^2(925)=1669.24$ $Prob>chi^2 = 0.000$		
Sargan test for	$chi^2(455)=891.07$		

(Endogenity)	***Prob>chi^2 = 0.000***		
No. of Observation	***1287***		

- *GMM estimates.*
- *Robust standard errors are given.*
- *Arellano- Bond AR (1) test is for instruments validity under the null hypothesis that instruments are valid.*
- *Hansen test used for exogeneity under the null hypothesis that instrument as a group are exogenous.*
- *Statistical significance at 1%, 5% and 10% are denote by *, ** and *** respectively.*

The System GMM results for our model related to the role of financial inclusion in poverty indicates that all the financial inclusion indicators are significantly positively related to the poverty measure of Headcount ratio except the indicator of accounts, which is not significant in this case. This means that indicators of financial inclusion have a direct relationship with poverty and does not help in the reduction of poverty.

The Arellano-Bond AR (2) test for model 02 is 0.855 which is high enough, presenting that we cannot reject the null hypothesis and concludes the instruments are valid. Moreover null hypothesis based on Hansen test states the instruments as group are exogenous. Reported chi-square value for Hansen test is 0.279 showing that instruments as a group are exogenous. This result is consistent with Gontila et al, (2013).

Effect of Financial Inclusion Variables on Income Inequality, Model 3

This section covers the results related to model measuring the impact of financial inclusion in lowering income inequality. The system GMM yields the following results.

Table 10: Effect of Financial Inclusion Variables on Income Inequality, Model 3.

Income Inequality	*Coefficients*	*Standard Errors*	*P values*
Income inequality D1	***-0.1742033***	***0.0820373***	***0.036****
Accounts	***-0.1030212***	***0.0352184***	***0.004****
Borrowers	***-0.046119***	***0.0102902***	***0.000****
Depositors	***-0.0066468***	***0.0023402***	***0.005****
Bnk.Branch	***-0.3159515***	***0.0987401***	***0.002****

Life Insuranc	***-0.7940822***	***0.4737***	***0.097******
The Arellano-Bond AR (1) of serial correlation	***z = -5.05*** ***Pr > z = 0.842***		
Sargan-Hansan test of (Over identification)	***chi^2(123)=1116.40*** ***Prob>chi^2 = 0.000***		
Sargan test for (Endogenity)	***chi^2(61)=78.67*** ***Prob>chi^2 = 0.064***		
No. of Observation	***1212***		

- *GMM estimates.*
- *Robust standard errors are given.*
- *Arellano- Bond AR (1) test is for instruments validity under the null hypothesis that instruments are valid.*
- *Hansen test used for exogeneity under the null hypothesis that instrument as a group are exogenous.*
- *Statistical significance at 1%, 5% and 10% are denote by *, ** and *** respectively*

The above table show that all of the financial inclusion indicators have significantly negative relationship with income inequality. The financial inclusion indicator, accounts which measure the percentage of adults having an account with formal financial institution, on average will result in reduction of unequal income distribution by 10.3% if its number is increased by 1% citrus paribus. Similarly on average borrowers will help reduce income inequality by 4.6% if borrowers from formal financial institutions are increased by 1%, citrus paribus. The results shows that as the number of bank branches are increased by 1 per 100,000 adults, on average it will reduce income inequality by 31.5%, citrus paribus. The result of life insurance is no different. The above table shows that on average if life insurance premium to GDP ratio is increased by 1%, the income inequality will be reduced by 79.4% citrus paribus at 10% significance level.

Comparison of Model 1,2,3 (Effect of Financial Inclusion Variables on Economic Growth, Poverty and Income Inequality).

Variables	*Model 1 (Economic Growth)*	*Model 2 (Poverty)*	*Model 3 (Income Inequality)*
Lag dependent	***0.4453196*** ***(0.0391242)***	***0.1704822*** ***(0.0095168)***	***-0.1742033**** ***(0.0820373)***

Accounts	***0.0175432* (0.0061954)***	***0.0049887 (0.0105624)***	***-0.1030212* (0.0352184)***
Borrowers	***0.002302 (0.0015875)***	***0.0027428** (0.001208)***	***-0.046119* (0.0102902)***
Depositors	***0.0012323* (0.0004957)***	***0.0006621** (0.0002875)***	***-0.0066468* (0.0023402)***
Bnk.Branch	***0.1013903 (0.0207981)****	***0.0370994* (0.0101857)***	***-0.3159515* (0.0987401)***
Life Insuranc	***0.4620676 (0.2312168)****	***0.5514003* (0.0969549)***	***-0.7940822*** (0.4737)***
The Arellano-Bond AR (1) of serial correlation	***z = -0.78 Pr > z = 0.435***	***z = -1.16 Pr > z = 0.245***	***z = -5.05 Pr > z = 0.842***
Sargan-Hansan test of (Over identification)	***chi^2(123)=2491.29 Prob>chi^2 = 0.000***	***chi^2(925)=1669.24 Prob>chi^2 = 0.000***	***chi^2(123)=1116.40 Prob>chi^2 = 0.000***
Sargan test for (Endogenity)	***chi^2(61)=86.98 Prob>chi^2 = 0.016***	***chi^2(455)=891.07 Prob>chi^2 = 0.000***	***chi^2(61)=78.67 Prob>chi^2 = 0.064***
No. of Observation	***1212***	***1287***	***1212***

- *GMM estimates.*
- *Robust standard errors are given in paranthesis*
- *Arellano- Bond AR (1) test is for instruments validity under the null hypothesis that instruments are valid.*
- *Hansen test used for exogeneity under the null hypothesis that instrument as a group are exogenous.*
- *Statistical significance at 1%, 5% and 10% are denote by *, ** and *** respectively.*

Summary and Conclusion

The results of the study indicate that all of the indicators of financial inclusion variables are highly significant at a 5% significance level, except for the variable of

borrowers, which represents the number of account holders using their accounts for credit purposes. All the variables have a significantly positive impact on economic growth.

The financial inclusion measure, accounts, representing the percentage of adult account holders at a formal financial institution, has a positive effect on economic growth. On average, a 1% increase in adult account holders leads to a 1.754% increase in economic growth. This suggests that having a bank account with a formal financial institution contributes to wealth accumulation, thereby boosting the country's economic growth, all else being equal.

The depositor indicator of financial inclusion, measuring the number of depositors or the number of adults per 1000 adults with bank accounts for savings or depositing surplus money, is also positively and significantly related to economic growth. On average, holding other factors constant, a 1.00 increase in the number of depositor account holders per 1000 adults leads to a 1% growth in the economy. This can be justified by the fact that surplus money in banks is utilized by those in need, which can contribute to economic growth.

Furthermore, the risk management factor of an individual, as measured by the financial inclusion variable, significantly affects economic growth in a positive manner. On average, a 1% increase in the premium to GDP ratio results in a 46.20% boost in economic growth, while holding other variables constant. This highlights that an increase in the usage of formal financial products and services for productive purposes can ultimately lead to economic growth.

In terms of poverty reduction, the results of the study are contrary to expectations, showing that measures of financial inclusion have a positive effect on poverty and do not help in reducing it. This could be explained by the need for not only an inclusive financial system but also an efficient one to effectively reduce poverty. The study suggests that lower-cost financial products and transparent access to them may lead to a reduction in poverty levels, emphasizing the importance of a developed financial system alongside financial inclusion.

It is worth mentioning that while financial inclusion indicators may not directly contribute to reducing poverty according to this study, they indirectly support poverty reduction by promoting economic growth and lowering income inequality.

Regarding income inequality, the study finds that various indicators of financial inclusion are negatively related to the unequal distribution of income in middle-income countries. This can be justified by the fact that as financial products and services become more accessible, they provide equal opportunities for all segments of

society, thereby helping to reduce income inequality. Additionally, the increased penetration and usage of financial products and services empower lower-income individuals to earn more and engage in productive activities, fostering entrepreneurship and further reducing income inequality.

The study conducted regression analysis using the Generalized Method of Moments (GMM) and gathered data from the World Development Indicators. The findings of the study align with previous research conducted by Calderón and Liu (2003), Agbetsiafa (2004), Demirgüç-Kunt and Levine (2008), Morgan and Pontines (2014), Sharma (2016a), and D.-W. Kim et al. (2018) in exploring the role of financial inclusion in the economic growth of countries.

Overall, the study sheds light on the relationship between financial inclusion and economic factors such as growth, poverty, and income inequality in middle-income countries.

Policy Recommendations and Future Research

- Measures to increase financial literacy and awareness about the financial system, its products, and services will help increase financial inclusion.
- In order to build an inclusive financial system, it is suggested that a sound and sustainable financial system be established, taking hindrances to financial services into account.
- Removing price and non-price barriers can help financial inclusion in reducing income inequality and thus contribute to economic growth.
- Policy makers should implement policies that ensure greater competition in providing banking services to all, which will, in turn, help achieve equitable distribution of income and lower income inequality.
- Unnecessary government intervention should be reduced. Encouraging privatization and deregulation can help the economy grow, reduce income inequality, and alleviate poverty.
- Provisioning pensions and old age benefits through banking services will help broaden access to financial services for the elderly population.
- A quality institutional framework will also help broaden access to financial services, including a strong rule of law and enforcement of financial contracts, which will reduce involuntary financial exclusion.
- Availability of credit and relaxed requirements for obtaining credit will help reduce poverty.
- Addressing the concerns of lower-income individuals and assisting them in accessing financial products and services will lower income inequality.

- Financial innovation and the use of electronic means such as internet banking and mobile banking will enhance financial inclusion and ensure greater access to financial products and services.
- Institutional reforms and the elimination of bureaucratic practices among financial service providers will also help broaden access to financial services and products.
- For further research, a more comprehensive measure of financial inclusion is needed, which includes additional indicators to capture a more accurate picture. This will also enable researchers to explore its role in other economic aspects of an economy.
- Including populations beyond middle-income countries, such as lower-income countries, would help determine the role of financial inclusion in the economy of the region.

REFERENCES

Acaravci, A., Ozturk, I., & Acaravci, S. K. (2007). Finance-growth nexus: Evidence from Turkey.

Aderibigbe, J. (2001). The role of the financial sector in poverty reduction. CBN Economic and Financial Review, 39(4), 135-158.

Agbetsiafa, D. (2004). The finance growth nexus: evidence from Sub-Saharan Africa. Savings and Development, 271-288.

Akindola, R. B. (2009). Towards a definition of poverty: poor people's perspectives and implications for poverty reduction. Journal of Developing Societies, 25(2), 121-150.

Amaghionyeodiwe, L. A., & Osinubi, T. S. (2004). Poverty reduction policies and pro-poor growth in Nigeria. Brazilian Electronic Journal of Economics, 6(1).

Ambarkhane, D., Singh, A. S., & Venkataramani, B. (2016). Measuring financial inclusion of Indian states. International Journal of Rural Management, 12(1), 72-100.

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

Ardic, O., Heimann, M., & Mylenko, N. (2011). Access to financial services and the financial inclusion agenda around the world: a cross-country analysis with a new data set.

Ardic, O. P., & Damar, H. E. (2006). Financial sector deepening and economic growth: Evidence From Turkey.

Atkinson, A. (2017). Monitoring global poverty: Report of the commission on global poverty. World Bank, Washington.

Ayyagari, M., Beck, T., & Hoseini, M. (2013). Finance and poverty: Evidence from India.

Babajide, A. A., Adegboye, F. B., & Omankhanlen, A. E. (2015). Financial inclusion and economic growth in Nigeria. International Journal of Economics and Financial Issues, 5(3), 629-637.

Bae, K., Han, D., & Sohn, H. (2012). Importance of access to finance in reducing income inequality and poverty level. International Review of Public Administration, 17(1), 55-77.

Barajas, M. A., Chami, M. R., & Yousefi, M. R. (2013). The finance and growth nexus re-examined: Do all countries benefit equally? : International Monetary Fund.

Beck, T., Demirguc-Kunt, A., & Honohan, P. (2009). Access to Financial Services: Measurement, Impact, and Policies. The World Bank Research Observer, 24(1), 119-145. doi:10.1093/wbro/lkn008

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

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

Bellù, L. G., & Liberati, P. (2005). Impacts of policies on poverty. Absolute poverty lines.

Bhandari, A. K. (2009). Access to banking services and poverty reduction: a state-wise assessment in India.

Boukhatem, J. (2016). Assessing the direct effect of financial development on poverty reduction in a panel of low- and middle-income countries. Research in International Business and Finance, 37, 214-230. doi:10.1016/j.ribaf.2015.11.008

Bruhn, M., & Love, I. (2014). The real impact of improved access to finance: Evidence from Mexico. The Journal of Finance, 69(3), 1347-1376.

Burgess, R., & Pande, R. (2005). Do rural banks matter? Evidence from the Indian social banking experiment. American Economic Review, 95(3), 780-795.

Calderón, C., & Liu, L. (2003). The direction of causality between financial development and economic growth. Journal of Development Economics, 72(1), 321-334.

Callen, T. (2017, July 29,2017). Gross Domestic Product: An Economy's All. Retrieved from http://www.imf.org/external/pubs/ft/fandd/basics/gdp.htm

Chakravarty, S. R., & Pal, R. (2013). Financial inclusion in India: An axiomatic approach. Journal of Policy Modeling, 35(5), 813-837. doi:10.1016/j.jpolmod.2012.12.007

Chambers, R. (2006). What is poverty? Who asks? Who answers?

Charles-Coll, J. A. (2011). Understanding income inequality: concept, causes and measurement. International Journal of Economics and Management Sciences, 1(3), 17-28.

Chibba, M. (2009). Financial Inclusion, Poverty Reduction and the Millennium Development Goals. The European Journal of Development Research, 21(2), 213-230. doi:10.1057/ejdr.2008.17

Claessens, S., & Perotti, E. (2007). Finance and inequality: Channels and evidence. Journal of Comparative Economics, 35(4), 748-773.

Conroy, J. (2005). APEC and financial exclusion: missed opportunities for collective action? Asia Pacific Development Journal, 12(1), 53-80.

Corrado, G., & Corrado, L. (2017). Inclusive finance for inclusive growth and development. Current Opinion in Environmental Sustainability, 24, 19-23.

Coudouel, A., Hentschel, J. S., & Wodon, Q. T. (2002). Poverty measurement and analysis. A Sourcebook for poverty reduction strategies, 1, 27-74.

De Maio, F. G. (2007). Income inequality measures. Journal of Epidemiology & Community Health, 61(10), 849-852.

Demirguc-Kunt, A., Beck, T., & Honohan, P. (2008). Access to Finance and Development: Theory and Measurement. Finance for All.

Demirgüç-Kunt, A., & Klapper, L. (2012). Measuring financial inclusion: The global findex database.

Demirguc-Kunt, A., Klapper, L., & Randall, D. (2014). Islamic Finance and Financial Inclusion: Measuring Use of and Demand for Formal Financial Services among Muslim Adults. Review of Middle East Economics and Finance, 10(2). doi:10.1515/rmeef-2013-0062

Demirguc-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution: The World Bank.

Demirgüç-Kunt, A., Klapper, L. F., Singer, D., & Van Oudheusden, P. (2015). The global findex database 2014: Measuring financial inclusion around the world.

Demirgüç-Kunt, A., & Levine, R. (2008). Finance and economic opportunity.

Estrada, G., Park, D., & Ramayandi, A. (2010). Financial development and economic growth in developing Asia.

Ghosh, S. (2011). Does financial outreach engender economic growth? evidence from indian states. Journal of Indian Business Research, 3(2), 74-99.

Green, C. J., Kirkpatrick, C. H., & Murinde, V. (2006). Finance for small enterprise

growth and poverty reduction in developing countries. Journal of International Development: The Journal of the Development Studies Association, 18(7), 1017-1030.

Green, D. (2008). From Poverty to Power: How Active Citizens and Effective States Can Change the World, Oxfam International: Oxford, UK.

Green, R. F. (2002). The Gini Index and Other Measures of Inequality. Retrieved from

Hamori, S., & Hashiguchi, Y. (2012). The effect of financial deepening on inequality: Some international evidence. Journal of Asian Economics, 23(4), 353-359.

Hannig, A., & Jansen, S. (2010). Financial inclusion and financial stability: Current policy issues.

Hardwick, P., & Khan, B. (1994). An introduction to modern economics. Retrieved from

Helena Afonso, M. L. a. D. A. (2015, October 21,2015). Inequality Measurement. Retrieved from https://www.un.org/development/desa/dpad/publication/no-2-inequality-measurement/

Hinson, R. E. (2011). Banking the poor: The role of mobiles. Journal of Financial Services Marketing, 15(4), 320-333.

Honohan, P. (2004). Financial development, growth and poverty: how close are the links? Financial development and economic growth (pp. 1-37): Springer.

Honohan, P. (2008). Cross-country variation in household access to financial services. Journal of Banking & Finance, 32(11), 2493-2500.

Honohan, P., & King, M. (2012). Cause and effect of financial access: cross-country evidence from the Finscope surveys. Banking the world: empirical foundations of financial inclusion, 45-84.

Imai, K. S., Arun, T., & Annim, S. K. (2010). Microfinance and household poverty reduction: New evidence from India. World Development, 38(12), 1760-1774.

Jalilian, H., & Kirkpatrick, C. (2002). Financial development and poverty reduction in developing countries. International journal of finance & economics, 7(2), 97-108.

Kai, H., & Hamori, S. (2009). Globalization, financial depth and inequality in Sub-Saharan Africa. Economics Bulletin, 29(3), 2025-2037.

Kappel, V. (2010). The effects of financial development on income inequality and poverty.

Karlan, D., & Morduch, J. (2010). Access to finance Handbook of development economics (Vol. 5, pp. 4703-4784): Elsevier.

Kawachi, I., & Kennedy, B. P. (1997). The relationship of income inequality to mortality: does the choice of indicator matter? Social science & medicine, 45(7), 1121-1127.

Kendall, J., Mylenko, N., & Ponce, A. (2010). Measuring financial access around the world.

Kim, D.-W., Yu, J.-S., & Hassan, M. K. (2018). Financial inclusion and economic growth in OIC countries. Research in International Business and Finance, 43, 1-14. doi:10.1016/j.ribaf.2017.07.178

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.

Kularatne, C. (2002). An Examination of the Impact of Financial Deepening on Long-Run Economic Growth: An Application of a VECM Structure to a Middle-Income Country Context. South African Journal of Economics, 70(4), 300-319.

Kumar, C., & Mishra, S. (2011). Banking outreach and household level access: analyzing financial inclusion in India. Paper presented at the 13th Annual Conference on Money and Finance in the Indian Economy.

Kuznets, S. (1973). Modern economic growth: findings and reflections. The American economic review, 63(3), 247-258.

Law, S. H., & Tan, H. B. (2009). The role of financial development on income inequality in Malaysia. Journal of Economic Development, 34(2), 153.

Leyshon, A., & Thrift, N. (1995). Geographies of financial exclusion: financial abandonment in Britain and the United States. TRANSACTIONS-INSTITUTE OF BRITISH GEOGRAPHERS, 20, 312-312.

Liang, Z. (2006). Financial development and income distribution: A system GMM panel analysis with application to urban China. Journal of Economic Development, 31(2), 1.

Matin, I., Hulme, D., & Rutherford, S. (2002). Finance for the poor: from microcredit to microfinancial services. Journal of International Development, 14(2), 273-294.

McKay, A. (2002). Inequality Briefing. Briefing Paper, 1, 1-6.

Mohan, R. (2006). Economic growth, financial deepening, and financial inclusion. Dynamics of Indian Banking: Views and Vistas, 92-120.

Morduch, J. (2006). Concepts of poverty. Handbook on poverty statistics: Concepts, methods and policy use, 23-50.

Morgan, P., & Pontines, V. (2014). Financial stability and financial inclusion.

Nazmi, N. (2005). Deregulation, financial deepening and economic growth: The case of Latin America. The Quarterly Review of Economics and Finance, 45(2-3), 447-459.

Neaime, S., & Gaysset, I. (2018). Financial inclusion and stability in MENA: Evidence from poverty and inequality. Finance Research Letters, 24, 230-237. doi:10.1016/j.frl.2017.09.007

Nikoloski, Z. (2013). Financial sector development and inequality: is there a financial Kuznets curve? Journal of International Development, 25(7), 897-911.

Nzotta, S. M., & Okereke, E. J. (2009). Financial deepening and economic development of Nigeria: An Empirical Investigation.

Okoye, L. U., Erin, O., & Modebe, N. J. (2017). Financial Inclusion as a Strategy for Enhanced Economic Growth and Development. The Journal of Internet Banking and Commerce, 1-14.

Pal, R., & Pal, R. (2014). Income related inequality in financial inclusion and role of banks: evidence on financial exclusion in India.

Park, C.-Y., & Mercado, R. (2015). Financial inclusion, poverty, and income inequality in developing Asia.

Peterson, E. (2017). Is Economic Inequality Really a Problem? A Review of the Arguments. Social Sciences, 6(4), 147.

Quach, M. H. (2005). Access to finance and poverty reduction: an application to rural Vietnam. University of Birmingham.

Ravallion, M. (2016). The Economics of Poverty. History, Measurement. Policy.

Rousseau, P. L., & Wachtel, P. (2005). Economic growth and financial depth: is the relationship extinct already?

Samuelson, P. A., & Nordhaus, W. D. (1995). Economics: International Edition. New York. McGraw-Hill Inc.

Sarlo, C., Clemens, J., & Emes, J. (2017). Income Inequality Measurement Sensitivities. Towards a Better Understanding of Income Inequality in Canada, 25.

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

Sarma, M. (2016). Measuring financial inclusion using multidimensional data. World Economics, 17(1), 15-40.

Sen, A. (1973). On Economic Inequality. Oxford: Clarendon Press.

Sen, A. (1999). Freedom as development: Oxford: Oxford University Press.

Shahbaz, M., & Islam, F. (2011). Financial development and income inequality in Pakistan: an application of ARDL approach.

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.

Sinclair, S. P. (2001). Financial exclusion: An introductory survey: CRSIS, Edinburgh College of Art/Heriot Watt University.

Spicker, P. (2007). Definitions of poverty: twelve clusters of meaning. Poverty: an international glossary, 229-243.

Tita, A. F., & Aziakpono, M. J. (2017). The effect of financial inclusion on welfare in sub-Saharan Africa: Evidence from disaggregated data. Retrieved from

Touray, M. (2016, Jul 29,2016). Definitions and Measures of Poverty. Retrieved from http://devinit.org/post/definitions-and-measures-of-poverty/

Townsend, P. (2006). What is poverty?: an historical perspective. Poverty in focus, 9(Decemb), 5-6.

Valverde, S. C., & Fernández, F. R. (2004). The finance-growth nexus: a regional perspective. European Urban and Regional Studies, 11(4), 339-354.

Wagle, U. (2002). Rethinking poverty: definition and measurement. International Social Science Journal, 54(171), 155-165.

Wajdi Dusuki, A. (2008). Banking for the poor: the role of Islamic banking in microfinance initiatives. Humanomics, 24(1), 49-66.

Weiss, J., Montgomery, H., & Kurmanalieva, E. (2003). Micro finance and poverty reduction in Asia: what is the evidence?

Williams, H. T., Adegoke, A. J., & Dare, A. (2017). Role of Financial Inclusion in Economic Growth and Poverty Reduction in A Developing Economy. International Journal of Research in Finance and Marketing, 7(4), 175-182.

Zheng, B. (1997). Aggregate poverty measures. Journal of Economic Surveys, 11(2), 123-162.

Agbetsiafa, D. (2004). The finance growth nexus: evidence from Sub-Saharan Africa. Savings and Development, 271-288.

Bhandari, A. K. (2009). Access to banking services and poverty reduction: a state-wise assessment in India.