

Financial Inclusion and Economic Growth: A Global Perspective

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Abstract:

There is a bulk of studies available that deals with the determinants of economic growth with different perspectives. However, no serious attempt has been made yet that considers financial inclusion as an indicator of economic growth. For this purpose, financial inclusion is measured by bank accounts, bank branches, auto teller machines and life insurance premium where economic growth is taken as growth of per capita GDP. For this objective panel data set of 185 countries has been used covering the period from 1996 to 2015. Fixed effect model based on Hausman test is being used to identify the association between financial inclusion and economic growth. Furthermore, two stage least squares (2SLS) method is applied to control the possible problem of endogeneity. The econometric results indicate that financial inclusion has positive impact on economic growth. It implies that excavating financial inclusion through providing credit facilities at disaggregate level is a route to economic growth.

Keywords: Financial Inclusion, Economic Growth, Panel Data Analysis

1. Introduction

Since the development of Economics dated back to Adam Smith in 17th century, economic growth remains a concern for researchers and policy makers. In real term, growth is fundamental factor that plays vital role in the development of nations. Different regions and countries around the world are facing different levels of well-being and this is due to significant level of divergence in economic growth and different levels of per capita growth. Different determinants of economic growth have been explored since the 17th century as economic growth has great importance for addressing different macro level issues such as unemployment, poverty, illiteracy and hunger.

Stable economic growth plays a role of spin for every competitive economy and leads to high level of standard of living and sustainable economic development. Due to importance of stable economic growth, strong evidence from past decades, the concept of financial inclusion has become imperative for economists and policy makers throughout the world. Financial inclusion can be defined as “the process of availability and ensuring access to financial services, such as bank deposit, credits, and insurance for all participants in an economy, timely and sufficient credit at an affordable cost.” In other words, the level of exclusion in a financial society means

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the circumstances in which most of an economy's participants are not able of using formal financial systems to gain benefit from financial services.

According to Global Findex 2017 report, around 1.7 billion adults lack the access to transaction account and are excluded from financial system¹. Keeping in view the importance of financial inclusion is mentioned as 7th goal in sustainable development goals. There is a broad census that high level of access to financial services boosts economic growth (Alfaro et al., 2004; King & Levine, 1993; Levine, 1999; Patrick, 1966; Siddique & Majeed, 2015; Majeed & Noreen, 2018). Moreover, the recognition of positive impact of financial inclusion and economic growth not only intensifies the importance of examining this connection but also stresses the importance of exploring the determinants of financial inclusion.

Financial inclusion is the provision of financial services to every individual of the economy in a broader sense. Financial inclusion can help eradicate hurdles that has overwhelmed the limitations of some collective groups and individuals that include the poor and underprivileged. They can get access to fair means of financial services such as deposits, credit insurance and payments at lower cost (Carbo, Gardener, & Molyneux, 2007; Conroy, 2005; Leyshon & Thrift, 1995).

In both developing and developed countries, the issue of financial inclusion has become the area of interest for policy makers and researchers. The financial restore of the 1980s and 1990s in most economies were expected to grow financial depth and the use of services such as loans, savings, payment services, and so on. However, the length of access to financial services is still very low.

A mounting body of research has dedicated attention to valuable effects for individuals that promote financial inclusion with the provision of economic, political foundation for government policies. Notably, the use of bank accounts is making evidence more convincing. Bank account raises savings, consumption and productive investment of entrepreneurs (Dupas, Green, Keats, & Robinson, 2012). Further, inclusive finance lessens the impact of macroeconomic shocks on households, small and medium-sized enterprises. Studies show that inclusive finance, in the absence of limitations helps firms to access external funds to meet their liquidity needs both in

¹ Universal Financial Access - Measuring Progress towards Financial Inclusion - World Bank Group. (2017).

normal and distressed time. An improved financial access allows households to smooth consumption and protect them to fall into poverty.

Financial inclusion is a multidimensional phenomenon. It is well recognized that performance of financial system significantly differs across different dimensions, across geographical regions and over time (Beck et al., 2007; Chakravarty & Pal, 2013; Honohan, 2008).

Although for sustainable development, financial inclusion has become contemporary on the global policy agenda, economic literature on financial inclusion is still in its early stages. No standard method has yet been introduced to measure financial inclusion. Subsequently, current studies propose different measures of financial inclusion.

This paper contributes to the existing literature by providing an insight that how financial inclusion can accelerate economic activity by using four measures of financial inclusion that are a number of bank branches, a number of accounts, a number of ATMs and life insurance premium. The empirical analysis includes seven regions including South Asia, Europe and Central Asia, East Asia & Pacific, North America, which Middle East & North Africa, Latin America & Caribbean and Sub-Saharan Africa. We have done our analysis on panel data set using fixed effects and random effect models.

Paper consists of the following subsections. Section 2 of the paper represents the brief review of financial inclusion and economic growth and Section 3 includes the methodological framework of the study, Section 4 provides the description of the data, Sections 5 and 6 describe the statistical results obtained from econometric technique and conclusion, respectively.

2. Literature Review

Previous literature on finance and growth generally focused on financial liberalization and financial development. There is an on-going debate whether there is a positive relationship between economic growth and financial liberalization or negative (Andersen & Tarp, 2003; Gibson & Tsakalotos, 1994). Buman et al. (2013) found that there is a direct but weak association between financial liberalization and economic growth. This conclusion suggests that only financial liberalization is not

enough for economic growth, but it can be fruitful if it is combined with fiscal or monetary policies or other institutional measures for regulation of financial markets (Claessens, Kose, & Terrones, 2010). Similarly, studies such as Bittencourt (2012) and Majeed and Malik (2016), find that financial development and economic growth are positively associated.

Financially developed countries get benefit from FDI, but it plays an uncertain role in economic growth (Alfaro et al., 2004). Literature suggests that better local financial markets are needed to get maximum benefits from FDI (Hermes & Lensink, 2000; Majeed, 2017b). In financial development and economic growth, causal correlation is examined as international evidence by Jung (1986). Financial development in LDCs has a supply-leading causality pattern more repeatedly than a demand-following pattern while in developed countries reverse causality is being observed.

In present study, literature highlights the importance of financial inclusion as financial inclusion has become important policy measure in recent years after current financial crisis. Preceding literature provides evidence that financial inclusion has a positive impact on economic development and well-being of people.

Financial inclusion is a multidimensional phenomenon which varies across different countries. For example in UK, access to banking, credit and face to face money advice are used as the dimensions of financial inclusion (Chakravarty & Pal, 2013). Countries with open capital accounts have a larger rise in financial depth and economic growth as compared to countries not having open capital accounts. OECD countries have greater access to open accounts as compared to non-OECD countries and thus have better financial development which results in faster economic growth (Klein & Olivie, 2008).

Countries with greater income per capita, low level of income inequality, developed infrastructure and higher literacy level tend to be more financially inclusive. Sarma and Pais (2008), in a cross-country analysis, concluded that financial exclusion is linked with social exclusion. Banking sector variables suggest that interest rate and government ownership have insignificant impact on the financial inclusion. Increase in capital asset ratio and foreign ownership in the banking sector leads to financial exclusion.

Financial integration is a causal factor to financial volatility in MENA, financial inclusion is positively related to financial stability. However, financial integration has negatively contributed to financial stability. Enhancement in financial inclusion and population directly contributes to financial stability. Expansion in the use of banking services can have a straight effect on income distribution (Neaime & Gaysset, 2018).

Recent financial crisis shows that financial revolution can have overwhelming systemic influences. Financial inclusion causes risks at the institutional level, but institutions are scarcely systemic in nature. Literature shows that low-income investors and mortgagors tend to retain compact financial behavior during financial calamities, keeping credits in a secure position and repaying their loans. They discuss that more financial inclusion provides chances to boost financial constancy. In adding up, risks predominant at the levels of institutions are adaptable with recognized sensible tackle and more efficient consumer protection. The possible costs of financial inclusion are recompensed for by important dynamic assistances that increase financial constancy by time over a deeper and more expanded financial system.

By using axiomatic measure, Chakravarty and Pal (2013) study financial inclusion in India and find that social-banking policy contributed a vital role to promote financial inclusion across states. There is broad disparity in terms of financial inclusion across the states and over time in India. Financial inclusion has been adversely affected in six states of India due to eradication of social banking program.

Account ownership increases with economic development in developing countries. Country level characteristics show that probability of owing an account and account to save is less in those countries where cost of opening an account is higher while bank account frequency is negatively linked to cost of accounts. Financial inclusion is highly connected to more political stability and strong legal rights.

Fungacova and Weill (2015) analyze the financial inclusion in China by comparing it with other BRICS countries. Three main indicators have been focused e.g. formal account, formal saving and formal credit. It's been found that financial

inclusion is higher in China followed by greater use of formal use of account and formal saving as compared to BRIC countries. However, the use of formal credit is less in China as compared to BRICS. Credit is being obtained through borrowing from family or friends in BRICS countries as compared to China. Financial inclusion is not a main problem in case of China, but inadequate use of formal credit can cause a problem for more economic development.

The effect of different factors on the progress of financial inclusion shows that economic growth and financial inclusion are jointly correlated with each other. But the important point is that growth of population has inverse effect on economic growth (Kabakova & Plaksenkov, 2018). It is indicated that financial inclusion is a vital factor for economic growth. Econometric results indicate that in OIC countries financial inclusion has a direct impact on economic growth (Kim, Yu, & Hassan, 2018). In a recent study, Sethi and Acharya (2018) found positive impact of financial inclusion on economic growth in a sample of developed and developing countries. Findings of Sethi and Acharya (2018) cannot be generalized globally as sample size of their study is limited to only 31 countries from 2004 to 2010.

In the light of above discussion, it can be concluded that financial inclusion in developed countries has become the part of policies and strategies to enhance the economic growth. As financial inclusion is the lay of financial institutions and aggregation of the financial services that widens the financial sector to bring the financially excluded persons in financial net. Access to financial services improves the economic growth through credit making and increasing capital accumulation hence improving the level of investment and economic activity.

Our study aims to highlight the importance of financial inclusion in boosting economic growth. We'll see that how financial inclusion can bring stirred economic prosperity among people by including them into financial net.

3. Research Methodology

If we start with the earlier studies of economic growth or development, they took land, labor and capital as key features for economic growth. But the important factor "finance" has been ignored by earlier researchers. It was because of efficient market hypothesis and Modigliani-Miller theorem. But modern theories of development have strong advocacy for finance and consider it as an important factor

for growth. In many theories it has been found that development in financial sector and easy entrance to financial services speed up the economic growth with a decrease of poverty and income inequality (Kakwani & Pernia, 2000).

Studies show that for the economic activities at micro level, individual firm, or at aggregate level, overall economy, are also in need of finance, which can be provided through formal channels. Most of studies also argued that financial inclusion is significant because the level of the poor's access to financial services is measured as a useful tool that can help to increase economic activities and that in return increases the economic growth by involving all member of economy.

Taking financial inclusion as function of economic growth, we measured economic growth in terms of per capita GDP constant at 2010.

Panel equation for economic growth and financial inclusion (F.I) is as following:

$$Y_{i,t} = \alpha_{i,t} + \alpha_1 FI_{i,t} + \alpha_2 X_{i,t} + \mu_{i,t} \quad (1)$$

If we take data at level form without any transformation, data become extremely skewed from the mean and median. The solution for this problem is taking natural log of the data. After taking the data in transformation (natural log), mean and median values of growth rate become similar and level of skewness also become moderate. Now we can write the above equations in natural log form because many standard studies have used model in log form.

Panel equation for economic growth and financial inclusion (FI) with natural log

$$\ln.Y_{i,t} = \alpha_{i,t} + \alpha_1 FI_{i,t} + \alpha_2 X_{i,t} + \mu_{i,t} \quad (2)$$

By adding measures of financial inclusion to above equation

$$\ln.Y_{it} = \alpha_{it} + \alpha_1 \ln.BA_{it} + \alpha_2 \ln.GFCC_{it} + \alpha_3 \ln.INF_{it} + \alpha_4 LFP_{it} + \alpha_5 POPG_{it} + \alpha_6 SS_{it} + \alpha_7 TR_{it} + \mu_{it} \quad (3)$$

$$\ln.Y_{it} = \alpha_{it} + \alpha_1 \ln.BA_{it} + \alpha_2 \ln.GFCC_{it} + \alpha_3 \ln.INF_{it} + \alpha_4 LFP_{it} + \alpha_5 POPG_{it} + \alpha_6 SS_{it} + \alpha_7 TR_{it} + \mu_{it} \quad (4)$$

$$\ln.Y_{it} = \alpha_{it} + \alpha_1 \ln.ATM_{it} + \alpha_2 \ln.GFCC_{it} + \alpha_3 \ln.INF_{it} + \alpha_4 LFP_{it} + \alpha_5 POPG_{it} + \alpha_6 SS_{it} + \alpha_7 TR_{it} + \mu_{it} \quad (5)$$

$$\ln.Y_{it} = \alpha_{it} + \alpha_1 LIP_{it} + \alpha_2 \ln.GFCC_{it} + \alpha_3 \ln.INF_{it} + \alpha_4 LFP_{it} + \alpha_5 POPG_{it} + \alpha_6 SS_{it} + \alpha_7 TR_{it} + \mu_{it} \quad (6)$$

The last measure of financial inclusion which is life insurance premium is not taken in log form because it is already in the percentage form of GDP. Whereas Number of Bank Branches (BB), Number of Bank Accounts (BA) and Number of Auto teller Machines (ATM). The last measure of financial inclusion which is life

insurance premium (LIP) is not taken in log form because it is already in the percentage form of GDP.

Panel data have become popular due to its flexibility of estimating N cross sections up to T periods of time. It allows estimation in time as well as space dimensions. In panel data we start with basic idea of having same parameters in all cross sections called pooling assumption. If this assumption is fulfilled then use of panel data have many advantages, from which one is that one can increase the sample size and obtain efficient results (Baltagi, 2008). The problem of omitted variables yields biased results, but panel data regressions tackle this problem well.

Now at first step, we start with simple Ordinary least square technique, named as Pooled OLS, after that we will apply fixed effects and random effects. But selection between random effects and fixed effect is made on Hausman test. If in our model a few or all explanatory variables are endogenous then OLS estimators will be biased and inconsistent. The next step is choosing suitable instrumental variable technique to solve the problem of endogeneity in our model.

$$\text{Cov}(\text{financial inclusion},) \neq 0$$

In this case there is strong evidence for endogeneity, so we move to instrumental variable technique such as two stage least square (2SLS) because the estimators in presence of endogeneity are biased and not efficient. To tackle this problem using the instrument variable „z“ is best approach and lags of independent variables have been used as instruments.

3.1 Procedure

This study exploits the global data set of financial inclusion for all countries. However, some of countries do not have the series for financial inclusion. Therefore, final available sample was limited to 185 countries. The time period of this study spans over 1996-2015 based on the availability of the data. Economic growth that is outcome variable is constructed using natural log of GDP per capita.

Financial inclusion indicates that within an economy how many economic agents, individually or firms use formal financial services. Statistics of financial services usage is the important key measure of financial inclusion like accounts ownership, credit, saving, insurance among others. Choice of good measures of financial inclusion and evaluation of its impact on economic growth is critical. In the

light of existing literature four measures of financial inclusion namely „number of bank branches“, „number of accounts“, „number of A Ms“ and „life insurance premium“ are used (Kim et al., 2018; Neaime & Gaysset, 2018):

Number of Bank Branches: First indicator for financial inclusion is no. of commercial bank branches per 100,000 for adults as proxy for financial institutions penetration rate, that shows financial services access. Through this measure of bank branches, we can assume the level of existence of financial institutions in that country.

Number of Bank Accounts: Number of deposit accounts at commercial banks is the second measure, which calculates number of accounts per 1000 adults. This proxy is used for the saving accounts as it can measure degree of saving accounts opened by people at financial institution.

Number of ATMs: Using auto teller machines (ATM) by 100,000 adults shows the number of account holders. It quantifies the number of people that have account at financial institution. The best way to measure this variable is that count the number of accounts of firms or people, but data is limited to 2011 at World Bank, therefore we measure this variable by using ATM cards as a proxy for account holders because, usually financial institutions issue either ATM card or debit card to their account holder. So, ATM card holding rate indirectly is counting the number of account holders.

Table 1: Summary Statistics of Model Variables

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Ln. GDP per capita	3530	8.38	1.52	4.81	11.88
Ln. No. of Bank Branches	1961	2.34	1.21	-2.12	5.67
Ln. No. of Bank Accounts	953	5.54	1.46	-.89	8.12
Ln. No. of ATM	1778	2.84	1.63	-3.91	5.67
Life Insurance Premium	2610	1.40	2.23	.00	15.78
Ln. Capital	2650	22.58	2.17	17.37	28.56
Inflation	3179	8.34	22.73	.128	279.4
Labor	2047	59.91	10.10	26.37	94.30
Population Growth	3695	1.461	1.358	-1.21	7.87
Secondary School Enroll.	2484	76.45	30.14	5.21	163.93
Trade	3352	91.53	59.34	.03	860.80

Life Insurance Premium: For measuring the proxy of insurance, we used life insurance premium volume to GDP. Insurance is known as the most important risk

minimizer financial service. That can be used to protect a person from unpredicted accident and financial instability. Therefore, taking life insurance premium to GDP is an appropriate proxy for measuring the degree of insurance. For this variable data is taken from Sigma report (Swiss Re.) and WDI.

Gross fixed capital formation (constant 2010 US dollars) is our first control variable. Capital plays important role in production as well as economic growth. An increase in capital stock raises the investment which in return increases the level of GDP. We have used natural log of gross fixed capital formation and it is our independent variable.

Annual percentage change in the prices of basket of goods and services and it is measured by consumer price index. Labor plays a fundamental role in production. It is an engine to lead the gross domestic product and directly raises economic growth. Labor force participation rate (% of total population age 15+) is used to measure the labor force.

Table 2: Summary of Model Variables and Data Sources

Dependent Var.	Variable	Notation	Source	Measurement	Transformation	
Focused variables	Economic Growth	Y	WDI	Numerical	Ln	
	Financial Inclusion	No. of Bank Branches	BB	GFI	Numerical	Ln
		No. of Bank Accounts	BA	GFI	Numerical	Ln
		No. of Auto teller Machines	ATM	GFI	Numerical	Ln
		Life insurance premium	LIP	GFI	Numerical	Level
		Gross Fixed Capital Formation	GFCC	WDI	Numerical	Ln
	Macroeconomics Variables	Inflation	INF	WDI	Numerical	Level
		Labor Force Participation rate	LFP	WDI	Numerical	Level
		Population Growth	POPG	WDI	Numerical	Level
		Secondary School Enrollment	SS	WDI	Numerical	Level
Trade		TR	WDI	Numerical	Level	
Control Variables						

WDI = World development indicators (2017)

GFI = Global Financial Inclusion (2017)

Trade plays vital role in the course of economic growth (Majeed, 2016). Past literature has confirmed the positive relation between trade and economic growth. According to Heckscher-Ohlin theory, trade openness is more beneficial between two countries so we use trade openness which is in current US dollars. Human Capital is measured by gross percentage of secondary school enrollment regardless of age. Secondary school enrollment gives fundamental reading and writing skills

along with essential understanding with subject like mathematics, social sciences, natural sciences and history etc. The data of secondary school enrollment is taken from World Development Indicators (2017).

4. Data Analysis

Results of pooled OLS, fixed effects and random effects analysis and instrumental technique are being discussed in this section. Cross section as well as panel data sets are used to assess the empirical linkages between economic growth and financial inclusion.

We have used variety of proxies for financial inclusion. Column 1 of Table 3 shows the estimated coefficient where we add four measures of financial inclusion one by one. According to the CS OLS results there is positive and statistically significant relationship between financial inclusion and economic growth.

Table 3: CS OLS: Regression Analysis of Financial Inclusion on Economic Growth				
Regressors	Economic Growth			
	(1)	(2)	(3)	(4)
Ln. Bank branches	.4930*** (.0847)			
Ln. of Bank A/c		.2630** (.1040)		
Ln. ATM			.5920*** (.0625)	
Life Ins. Premium				.1330*** (.0456)
Capital	-.1520 (.1930)	.0420 (.2320)	-.3400** (.1710)	-.0136 (.2150)
Inflation	-.0010 (.0027)	-.0001 (.0031)	-.0024 (.0024)	-.0016 (.0032)
Labor	.0166*** (.0040)	.0101* (.0057)	.0057 (.0038)	.0144*** (.0047)
Population Growth	.1840*** (.0661)	.1300 (.1040)	.2140*** (.0593)	.0048 (.0700)
Secondary School Enroll.	.0155*** (.0030)	.0171*** (.0047)	.01260*** (.0027)	.01850*** (.0030)
Trade	.0063*** (.0014)	.0090*** (.0021)	.0052*** (.0012)	.0076*** (.0016)
_cons	5.630*** (.569)	4.381*** (.779)	6.407*** (.501)	6.070*** (.629)
N	156	93	154	163
R ²	.720	.607	.780	.624
Adj. R ²	.707	.575	.769	.607
F	54.32	18.79	73.86	36.68

Standard errors in parentheses: * $p < .1$, ** $p < .05$, *** $p < .01$

The coefficient of number of bank branches shows 1 percent increase in number of branches increases economic growth by .493 percent. These results are supported by the studies (Kim et al., 2018). Second measure which is number of bank accounts also shows that 1 percent increase will bring .263 percent increase in economic growth and consistent with (Kim et al., 2018; Sarma & Pais, 2008). Numbers of auto teller machines also make access to financial services which have also positive impact on economic growth by .592 percent. These findings are supported by Babajide et al. (2015) and Kim et al. (2018). The last indicator is life insurance premium is also showing significant and positive impact on growth and has support from the study of (Kim et al., 2018).

Table 4: Pooled OLS: Regression Analysis of Financial Inclusion on Economic Growth

Regressors	Economic Growth			
	(1)	(2)	(3)	(4)
Ln. Bank Branches	.4080*** (.0270)			
Ln. of Bank A/c		.1490** (.0604)		
Ln. ATM			.4200*** (.0269)	
Life Ins. Premium				.0167* (.0090)
Capital	.2660*** (.0122)	.3280*** (.0292)	.2120*** (.0136)	.2610*** (.0141)
Inflation	-.0126*** (.0036)	-.0076 (.0061)	-.0146*** (.0035)	-.0093*** (.0020)
Labor	.0231*** (.0021)	.0134*** (.0034)	.0136*** (.0022)	.0157*** (.0020)
Population Growth	.1040*** (.0140)	.80*** (.0195)	.1240*** (.014)	.0972*** (.0149)
Secondary School Enroll.	.0241*** (.0012)	.0282*** (.0025)	.0199*** (.0014)	.0304*** (.0010)
Trade	.0048*** (.0004)	.0044*** (.0010)	.0049*** (.0004)	.0055*** (.0004)
_cons	-2.3410*** (.2930)	-3.6430*** (.6280)	-.4750 (.3270)	-1.1950*** (.3430)
N	919	328	884	1324
R ²	.808	.759	.803	.737
Adj. R ²	.806	.753	.801	.736
F	547.0	143.7	509.3	527.6

Standard errors in parentheses: * $p < .1$, ** $p < .05$, *** $p < .01$

Column 1 of Table 4 gives the estimated coefficients where we regress the economic growth on natural log of financial inclusion where life insurance premium is taken without natural log. This Table includes four variables of financial inclusion and utilizes some macro level variables to control economic growth. If there is

significant cross sectional or significant temporal effect, we cannot assume a constant intercept for all the countries and years. This restriction of having same intercept requires inclusion of fixed effects and random effects method in panel estimations. Column (1) of Table 4 indicates that 1 percent increase in number of bank branches brings about .408 percent increase in economic growth. If we talk about number of bank accounts, its estimated coefficient also shows that 1 percent increase in number of accounts leads to .149 percent increase in economic growth. Furthermore, coefficients of number of ATMs and life insurance premium indicate that 1 percent increase in these variables foster economic growth by .4200 and .167 percent respectively.

The intuition behind these results could be that as financial inclusion brings financially excluded people into financial net which in turn leads to poverty alleviation and make enable them to participate in economic development which results in high economic growth (Kim et al., 2018; Swamy, 2013).

Table 5: Panel Fixed Effects: Economic Growth and Financial Inclusion

Regressors	Economic Growth			
	(1)	(2)	(3)	(4)
Ln. Bank Branches	.0383*** (.0107)			
Ln. of Bank A/c		.0782*** (.0156)		
Ln. ATM			.1050*** (.0060)	
Life Ins. Premium				.0042 (.0045)
Capital	.3160*** (.0178)	.2460*** (.0295)	.2090*** (.0178)	.5020*** (.0190)
Inflation	-.0008 (.0006)	-.0010 (.0009)	-.0022*** (.0005)	-.0041*** (.0004)
Labor	.0031*** (.0007)	.0004 (.0010)	.0022*** (.0007)	.0033*** (.0008)
Population Growth	.0262*** (.0044)	.0196*** (.0051)	.0246*** (.0039)	.0314*** (.0065)
Secondary School Enroll.	.0030*** (.0004)	.0024*** (.0006)	.0012*** (.0004)	.0016*** (.0005)
Trade	.0005** (.0002)	-.0002 (.0005)	.0008*** (.0002)	.0021*** (.0002)
_cons	1.0940*** (.3980)	2.1400*** (.6270)	3.5670*** (.4050)	-3.1970*** (.4270)
N	919	328	884	1324
R ²	.503	.579	.628	.608
Adj. R ²	.424	.458	.566	.569
F	114.5	49.85	182.2	266.9

Standard errors in parentheses: * $p < .1$, ** $p < .05$, *** $p < .01$

In column 1 of Table 5 the parameter of number of bank branches showing positive and significant impact implying that 1 percent increase in number of bank branches will increase economic growth by .04 percent. Capital has positive and significant relationship with economic growth and inflation has negative and insignificant relation with economic growth. Results are consistent with Kim et al. (2018), Majeed (2017a), and Majeed and Ayub (2018).

Fixed effects model estimates the parameters for each unit including dummy variable for each relevant factor which are ignored. In this way there is loss of degree of freedom and reduces the power of model and increases the standard error of the coefficients estimated. To avoid this problem, it is appropriate to use random effects model which do not involve the dummies and it expresses as ignorance through error term.

Table 6: Panel: Random Effects: Economic Growth and Financial Inclusion

Regressors	Economic Growth			
	(1)	(2)	(3)	(4)
Ln. Bank Branches	.0554*** (.0118)			
Ln. of Bank A/c		.0856*** (.0172)		
Ln. ATM			.1040*** (.0068)	
Life Ins. Premium				.0047 (.0047)
Capital	.3360*** (.0173)	.2720*** (.0289)	.2610*** (.0174)	.4780*** (.0177)
Inflation	-.0010 (.0007)	-.0012 (.0011)	-.0022*** (.0006)	-.0041*** (.0004)
Labor	.0027*** (.0008)	.00002 (.0011)	.0018** (.0008)	.0032*** (.0009)
Population Growth	.0253*** (.0049)	.0217*** (.0056)	.0255*** (.0045)	.0314*** (.0068)
Secondary School Enroll.	.0034*** (.0005)	.0027*** (.0007)	.0016*** (.0004)	.0024*** (.0005)
Trade	.0008*** (.0002)	.00039 (.0005)	.0010*** (.0002)	.0023*** (.0002)
_cons	.2330 (.3820)	1.1540* (.6130)	1.9580*** (.3930)	-2.9800*** (.3930)
N	919	328	884	1324
R ²	.5011	.5759	.6242	.6066
Adj. R ²	918.71	363.98	1238.59	1904.09
F	.0000	.0000	.0000	.0000

Standard errors in parentheses: * $p < .1$, ** $p < .05$, *** $p < .01$

In all columns of Table 6, estimated coefficients of financial inclusion which are bank branches, bank accounts and ATM machines are positively and significantly related to economic growth. The only measure which is life insurance premium is positively related to economic growth, but its impact is not significant due to small share of GDP as found by Kim et al. (2018).

Hausman test is employed now to confirm which model is appropriate either random or fixed model. The null hypothesis is that the difference in coefficients is not systematic and the alternative hypothesis is that the fixed effect model is appropriate. Rejection of null hypothesis leads us to selection of fixed model as suitable model.

Table 7: Hausman Test of Financial Inclusion

	Model 1		Model 2		Model 3		Model 4	
	Chi 2	Prob.	Chi 2	Prob.	Chi 2	Prob.	Chi 2	Prob.
Ln. Bank Branches	20.82	.004						
Ln. Bank A/c			3.22	.864				
Ln. ATM					167.28	.000		
Life Ins. Premium							33.75	.000

The main purpose of using two-stage least squares method is to handle the problem of reverse causality. For this, we used lagged values of variables as internal instruments and regional dummies as external dummies to remove the problem of endogeneity. To check the validity of instruments we applied Sargan test against the null hypothesis of instruments are exogenous. The results of this test show that instruments are valid as probability value is greater than .10 which leads to the acceptance of null hypothesis.

The estimated results of financial inclusion for 2SLS model are given in Table 8. These results clearly indicate that financial inclusion has positive and significant impact on economic growth irrespective of proxies used in all cases. All the proxies used for financial inclusion are significant at 1% level of significant. All the proxy measures are in favor of our hypothesis that financial inclusion has positive and significant impact on economic growth. This has also been found by Kim (2018) and San (2011).

Table 8: Panel: 2SLS Model Economic Growth and Financial Inclusion

Regressors	Economic Growth			
	(1)	(2)	(3)	(4)
Ln. Bank Branches	1.8860*** (.1260)			
Ln. of Bank A/c		6.4700** (2.9280)		
Ln. ATM			1.8900*** (.1210)	
Life Ins. Premium				4.0440** (1.7590)
Capital	.1920*** (.0269)	-.8880 (.5850)	-.0552 (.0348)	-3.1070** (1.4800)
Inflation	.0242*** (.0086)	-.1480** (.0726)	.0070 (.0075)	.1450** (.0719)
Labor	.0407*** (.0050)	.0224 (.0189)	-.0010** (.0050)	-.0391 (.0354)
Population Growth	.1220*** (.0319)	.4450** (.1740)	.2350*** (.0311)	-.0024 (.1960)
Secondary School Enroll.	.0033 (.0031)	-.1340* (.0758)	-.0196*** (.0040)	.0155 (.0145)
Trade	.0023*** (.0008)	-.0206 (.0128)	.00003 (.0010)	-.0532** (.0261)
_cons	-4.0100*** (.6590)	.0378 (3.8590)	5.8010*** (.8310)	79.7900** (35.6100)
N	782	323	878	1270
Sargan test	.2966	.0487	.1052	.0993
Basmann test	.3021	.0506	.1067	.1001

Standard errors in parentheses: * $p < .1$, ** $p < .05$, *** $p < .01$

5. Conclusion and Recommendations

Financial inclusion is an emerging and challenging issue of the world. At global level, many countries have valuable resources, but they are not extracting them due to the heavy cost of exploration. Some of them have resources of finance and enough capacity to control these issues but they are not playing effective role in this field due to different reasons. In this study, we have tried to untangle economic growth through financial inclusion. We have done our analysis on panel data set using fixed effect and random effect model. For economic growth analysis, data of 185 countries from seven regions for the time period of 1996-2015 are used.

Our empirical results clearly suggest that financial inclusion has significantly positive impact on economic growth. The results of random effects and fixed effects are the same within panel estimations. Results imply that economies with high level of financial inclusion will have more accelerated economic growth. This argument is

strengthened by our empirical results of all the indicators of financial inclusion except life insurance premium. Though it has positive impact on economic growth but not significant as it contributes a very small portion in GDP. So, it can be concluded that financial inclusion is closely associated with higher economic growth and has favorable impact. This paper will help in formulating policies that will foster financial inclusion in the region which in turn will accelerate the economic growth.

Our empirical findings have important policy implications:

- Instead of focusing only on macro level (financial development) government, should focus on micro (financial inclusion) level for the economic growth.
- Inclusive finance can increase the government efficiency for payment of social safety net transfers and new financial innovation reduces transaction cost and can bring more private sector involvement in economic development.
- To cope with the issue of informal economy financial inclusion can be used as a tool by providing formal financial services to non-users for reduction in poverty and to bring economic growth.

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