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THE FINANCIAL DEVELOPMENT AND POVERTY NEXUS: The Role of the Institutions

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Abstract

This study contributes to the literature by providing an interactive impact of financial development and institutions on poverty for a panel of 35 developed and 79 developing countries over the period 1984-2013 using two-stage least squares, system generalized method of moments, and simultaneous equations approach. The results show that financial development and institutions mitigate poverty, with the latter being more efficient than the former. The institutions strengthen the ability of the financial system to alleviate poverty. Further, the empirics state that both access (outreach) and depth (credit extension) of the financial sector matter for poverty reduction.

Keywords: Financial Development, Institutions, Poverty, System GMM.
JEL Classification: D63, E02, E51, I32.

I. Introduction

Poverty is a state of being deprived of basic life necessities and it is the leading cause of economic backwardness. According to the World Bank's Global Monitoring Report (2014), 1.01 billion people live below the absolute poverty line (i.e. $1.25/day). Although the World Bank (2014) shows a steady improvement in poverty reduction since the 1990's declaration of millennium development goals (MDGs), the progress has been uneven. East Asian and South Asian countries have shown a decline in poverty rates to a bit of extent; reverse has occurred in Sub-Saharan Africa, which contains about 80 per cent of the world's poor poverty stats.

For decades, economic growth has been considered a powerful force for reducing poverty. Poverty can be reduced by increasing economic activities, creating jobs, and

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rising per capita incomes of the poor [Dollar and Kraay (2002), Adams (2004) and Kraay (2006)]. Although growth prospects remain bust, poverty reduction remains a challenging goal and requires more than economic growth. Understanding the true causes of poverty is important to reduce poverty globally.

According to the World Bank, Major causes of poverty include failure to access credit and poor quality of institutions, among others. Many people remain poor because they cannot save and invest in productive purposes to raise their living standard [Khan and Majeed (2018b)]. In the absence of self-finance, a fundamental source of credit is financial institutions for the poor. Financial sector development in developing countries is part of strategies to promote growth and reduce poverty. It is the set of institutions, markets and instruments that permit transactions through the extension of credit.

Stiglitz (1998) called the financial system the 'brain' of the economy because it promotes growth by mobilizing and pooling savings, allocating resources and facilitating risk management. Further, it reduces inequality and poverty by broadening poor access to finance and investment and reducing their vulnerability to shocks. Finance affects the poor, both directly and indirectly, through its contribution to economic growth. As suggested by King and Levine (1993), a higher level of financial development is positively and significantly associated with a higher level of economic growth, while some studies suggested that sustainable growth is suitable for the poor [Dollar and Kraay (2002), Jalilian and Krickpatrick (2007)] King and Levine (1993)].

Apart from financial development, concern regarding the importance of sound institutions in reducing poverty is also getting attention in recent years. Institutions influence poverty by removing market inefficiencies and misallocation of recourses. Political authorities can use their legal power for illegitimate rewards, thereby creating market inefficiencies. On the other hand, sound institutions enforce property rights, justice, equity and economic efficiency. Good quality institutions lead towards higher levels of economic growth and provide a fertile ground for equal distribution of income.

FIGURE 1

Relationship between Financial Development, Institutions and Poverty

Given its direct impact on poverty, institutions can also reduce poverty indirectly by affecting financial development. The differences in the quality of institutions determine differences in the quality of finance [Demetriades and Law (2006)]. For example, improvements in financial development may not necessarily cause poverty reduction due to corruption in the banking and political arrangements, which may divert resources from the poor towards the rich or towards unproductive purposes. On the other hand, good institutions ensure that benefits of financial development reach the poor and productive activities. Given this close relationship between finance, institutions and poverty, no attempt has been made to examine the interactive impact of financial development and institutions on poverty. The purpose of this study is to fill this gap in the literature and to test the hypothesis that apart from their independent effects on poverty, whether the interaction between financial development and institutional quality has a negative influence on poverty separately?

In addition, we try to explore a link between financial development and poverty using a new measure called 'financial accesses'. Financial access can be defined as the amount of access that the financial system provides to the people. This access could be measured in the form of an increase in the number of bank branches, and the link is important because increased banks coverage helps optimal credit and financial services delivery to the poor [Jeanneney and Kpodar (2011), Gul, et al. (2018)]. This new relationship has been given little attention due to data unavailability. However, this study uses the limited available data to determine the link between financial access, depth and poverty.

Finally, the study estimates the indirect effects of institutions and financial sector quality using a system of equations. To determine the indirect effect, a system of semantical three equations model (8, 9 and 10) is specified where institutions and financial development directly influence growth and inequality and indirectly affect poverty outcomes through growth and inequality. This approach is helpful as it takes cares of the simultaneity between poverty, growth and inequality.

To achieve the objectives of the study, we use 2SLS and system GMM on a sample of 114 countries during the period 1984-2013. This study emphasizes the importance of sound institutions in the finance-poverty nexus. We find that institutions have a positive impact on poverty reduction and they reinforce the ability of financial development to reduce poverty. Our results indicate that financial development has a greater effect on poverty reduction when the financial system is embedded in a strong institutional framework. While mainly focusing on developing countries, we find that institutions are much stronger than financial development in reducing poverty in these countries. Another finding drawn from this study is that both the outreach and depth of the financial sector work together to alleviate poverty. The increase in the number of bank branches improves financial development, which is suitable for poverty reduction—finally, institutions and the financial sector help reduce poverty by boosting growth and lowering income inequality. Therefore, insti-

tutions and the financial sector directly help reduce poverty and indirectly through economic growth and income inequality.

The paper is arranged systematically. Section II summaries the literature on financial development, institutions and poverty. The empirical model, data sources and estimation methods are describe in Section III. The results present and interprets empirical of the studies are discussed in Section IV, while the study is concluded in Section V.

II. Literature Review

1. Relationship between Financial Development and Poverty

According to the theory, financial development can contribute to poverty reduction in numerous ways. First, a fundamental cause of poverty is a moral hazard or market failures that prevent the poor from borrowing and making productive investments. Financial markets remove these failures by providing an efficient way of saving, mobilizing and allocating resources [Stiglitz (1998)]. Second, besides increasing the poor's access to credit, financial markets provide them with risk-averse insurance services, which strengthen and enhance the productivity of their financial assets, thereby improving their livelihood [Jalilian and Krickpatrick (2007)]. Following this theory, many studies emphasize the positive association between financial development and poverty reduction. Using time-series data, Quartey (2005), Odhiambo (2010), Inoue and Hamori (2011), Khan, et al. (2012) and Uddin, et al. (2014) confirm the negative relationship of financial development with poverty.

Similarly, Honohan (2004) found that financial sector development is negatively associated with poverty. Beck, et al. (2007)[1] also investigated that financial development reduces inequality, increases the income share of the poorest and is strongly associated with poverty reduction. Using a sample of 65 developing countries from 1970 to 2008, Majeed (2015) found poverty reduction as financial development through remittances.

Besides having a direct impact on poverty reduction, financial development may also reduce poverty indirectly through its positive impacts on economic growth [Majeed and Ayub, (2018)]. For example, Jalilian and Kirkpatrick (2007) investigated a threshold level of economic development only up to which financial development reduced poverty indirectly through its positive impact on economic growth and concluded that financial development reduces poverty in developing countries. Jeanneney and Kpodar (2011) and Daly and Akhter (2009) concluded that financial development is good for the poor, but financial instability hurt them.

Contrarily, Rewilak (2013) suggests that the relationship between finance and poverty is less general than the literature suggests. By following Dollar and Kraay's

[1] Similar findings are drawn in Beck, et al. (2004).

methodology, they found out that financial development is helpful in reducing poverty, but its impacts are not universal. The analysis suggests that financial development reduces poverty only in South Asia; the reverse is true for Latin American and Caribbean countries, which is detrimental to the poor. Thus, the overwhelming body of literature supports the importance of financial development in poverty reduction.

2. Relationship between Institutions and Poverty

Since few years, the literature has begun to explore the association between institutions and poverty reduction, which is just the tip of the ice-burg; a detailed analysis has to be done as yet. The major difficulty in conducting empirical studies on the topic is limitations and complexity in defining and measuring institutions [Tebaldi and Mohan (2010)]. A lot of definitions have been presented to explain the concept of institutions. For example, according to North (1990), `institutions are the rules of the game in a society…humanly devised constraints that structure political, economic and social interactions. Institutions comprise state or formal institutions such as provision and protection of property rights, contract enforcement, and the rule of law, governance and financial markets. They also include non-state or informal institutions like social value, norms and habits. Engerman and Sokoloff (1997) argue that 'institutions should be interpreted as to encompass not only the political and legal structure but the culture as well'.

Sala-i-Martin (2002) interprets institutions as the set of rules and attributes according to which society works in modern capitalism. According to him, the measures of quality of institutions are control of corruption, property rights, effective judicial system, transparency of public administration, and pro/free market regulations. In this study, we closely follow Sala-i-Martin (2002), Glaeser, et al. (2004) and Knack and Keefer (1995) and measure institutions through control of corruption, the rule of law, political stability, bureaucratic quality, and democratic accountability. Broadly we interpret institutions as an aggregate index of all these measures.

Cross country analysis has shown that institutions and their quality matter for economic growth and development [Scully (1998), Acemoglu, et al. (2001), Knack and Keefer (1995)]. Institutions affect economic growth by causing the fair and efficient distribution of limited available resources. The studies show that higher quality of institutions has better investment, economic growth, inequality and poverty. Chong and Calderon (2000) and Chong and Gradstein (2007) demonstrate that institutions play a vital role in reducing poverty because good quality institutions ensure equal income distribution.

Chong and Calderon (2000) study the impact of five alternative measures of institutional quality on a degree (headcount ratio), severity (poverty gap) and incidence (Foster-Greer-Thorbecke index) of poverty. The authors report that all three measures of poverty are negatively correlated to institutional quality. Their findings also suggest

that institutional measures like law and order, corruption in government and repudiation of a contract are not significant and robust in alleviating poverty. While the low risk of expropriation and bureaucratic quality are highly significant, suggesting that improvement in the overall quality of institutions reduce poverty.

Another study by Hasan, et al. (2007) explores whether governance, ease of doing business, and alternative institutions matter for cross country economic growth and poverty reduction. The authors find that different measures of governance are not equally important for poverty reduction. When measured by the rule of law, governance has a strong direct and indirect (through economic growth) influence on poverty. In the same vein, Tebaldi and Mohan (2010) investigate the impact of institutions on poverty for a cross-section of developing countries. The estimates from the 2SLS method show that institutions help in reducing corruption and providing effective government, thereby boosting growth, minimizing income disparities and reducing poverty.

3. Relationship between Financial Development, Institutions and Poverty

The finance-poverty and institutions-poverty nexus are well developed (although very few studies on the latter), still no empirical study has investigated the interactive impact of financial development and institutional quality on poverty. However, few studies have highlighted the importance of institutional quality in the finance-growth relationship. For example, Demetriades and Law (2006) added to the literature by examining the interactive impact of financial development and institutional quality on economic growth. They provide evidence that financial development accompanied by a strong institutional structure is positively associated with economic growth. Using alternative data samples according to income levels, they found that financial development has a more significant impact on economic growth when embedded in a strong institutional structure.

The study by Law, et al. (2013) uses the threshold regression approach to explore the nonlinear relationship between finance, institutions and growth. They found a certain threshold institutional quality level only after which financial development contributes to economic growth; below that, institutional threshold level and financial development have an insignificant impact on growth.

III. Model, Data and Estimation

1. Model

The empirical Model follows Dollar and Kraay (2002), Tebaldi and Mohan (2010), and Jeanneney and Kpodar (2011). They model poverty as a real functional GDP per capita and some other variables, which in our case incorporate finance and

indicators related to the quality of institutions. Poverty is measured using two indicators, the share of the population earning less than $1.25 a day, and the poverty gap, which consider the distance of the poor from the poverty line. These two measures have been widely used in the empirical literature on poverty. In the empirical literature, aggregate poverty is also measured by the average per capita income of the poorest 20 per cent of the population; however , this measure is not used in this study.

To consider the impact of economic growth on poverty, we closely follow the existing literature on poverty. Some studies use the logarithm of average per capita income measured in the same year as the poverty indicator. Most research studies disagree about using average income to capture the impact of economic growth on poverty and suggest using the average GDP per capita growth rate. Some studies favour the first because average income already captures information on past growth episodes over a relatively long period, which is relevant when assessing the impact of long-term growth on poverty reduction. Moreover, average income considers the initial level of income, thus allowing us to control for the initial level of poverty. We test both approaches and the results remain the same; however, we mainly focus on average GDP per capita growth rate as it is widely used in the literature [Jalilian and Kirkpatrick (2007), Majeed (2017), Khan and Majeed (2018a)]. Different measures of GDP per capita are used depending on the indicator. We use GDP per capita, PPP (constant 2011 international $) as provided by the World Bank.

The literature on poverty determinants generally used a single equation model [Dollar and Kraay (2002), Jalilian and Kirkpatrick (2007), Tebaldi and Mohan (2010) and Jeanneney and Kpodar (2011)]. Following mainstream studies on poverty determinants, we initially specify a single equation model and later also consider the simultaneous equation model. Following the literature, the Model is extended in its simplest form to include five alternative measures of institutional quality as follows Model (1):

$$Pv_{it} = \alpha_0 + \alpha_1 GINI_{it} + \alpha_2 EG_{it} + \alpha_3 FD_{it} + \alpha_4 INS_{it} + \alpha_5 X_{it} + \varepsilon_{it} \quad (1)$$

Pv is defined as the percentage of the population living below the $1.25 poverty line. The income inequality index *GINI* is introduced as an independent variable to determine the role of income inequality, *EG* (Economic growth) is measured as growth rate of GDP per capita, *FD* measures level of financial development and include credit paid by commercial banks to the private sector, *INS* is an aggregate index of five alternative measures of institutions. The five measures used in this study are control of corruption (CC), government stability (GS), law and order (LO), democratic accountability (DA), and bureaucratic quality (BQ). These all measures are normalized between 0-1 and then averaged to generate the common index. The variable *X* includes other covariates of poverty to test robustness of the results; which are inflation (CPI), government consumption (GC) as a percentage of GDP, the sum of

export and imports as a percentage of GDP (trade), population growth (population) and primary school enrollment as an indicator of human development (HD).

Financial development can affect poverty in different ways depending on the quality of institutions. This idea can be formulated by including an interaction term which is the product of financial development and institutional quality. To examine how the introduction of institutions changes the relationship of finance with poverty, we extend our Model (1) to include interaction term as Model (2):

$$Pv_{it} = \alpha_0 + \alpha_1 GINI_{it} + \alpha_2 EG_{it} + \alpha_3 FD_{it} + \alpha_4 FD*INS_{it} + \alpha_5 X_{it} + \varepsilon_{it} \quad (2)$$

If the interaction term were omitted, then the impact of financial development on poverty would be solely determined by α_3. With the inclusion of the interaction term, however, the `net marginal impact' of financial development on poverty depends on the level of institutional quality obtained as:

$$\frac{\partial lnPov_{it}}{\partial Financialdevlopment_{it}} = \alpha_3 + \alpha_4 Institutionalquality_i \quad (a)$$

In addition, we investigate that how an increase in the number of bank branches (an outreach of the financial sector) affects the poor. First, we examine the impact of depth and access of the financial sector on the poverty ratio using equation Model (3). Then, we include interaction term to examine how the access to banking sector reinforces the impact of financial depth on poverty. The Equation Model (3 and 4) can be written as:

$$Pv_{it} = \beta_0 + \beta_1 GINI_{it} + \beta_2 EG_{it} + \beta_3 FD_{it} + \beta_4 BB_{it} + \varepsilon_{it} \quad (3)$$

$$Pv_{it} = \beta_0 + \beta_1 GINI_{it} + \beta_2 EG_{it} + \beta_3 FD_{it} + \beta_4 FD_{it} * BB_{it} + \varepsilon_{it} \quad (4)$$

where *BB* refers to commercial bank branches per 100,000 adults.

In addition, to estimate the direct effects of financial development and quality of institutions on poverty, we separate growth and inequality effects by regressing them on financial development, quality of institutions and other control variables. In this way, we estimate the indirect impacts of finance and institutions on poverty. To model it empirically, we use simulations equations model (5 to 7) as follows:

$$Pv_{it} = \alpha_0 + \alpha_1 GINI_{it} + \alpha_2 EG_{it} + \alpha_3 (GINI_{it} * FD_{it}) + \varepsilon_{it} \quad (5)$$

$$EG_{it} = \alpha_0 + \alpha_1 GINI_{it} + \alpha_2 FD_{it} + \alpha_3 INS_{it} + \alpha_4 X_{it} + \varepsilon_{it} \quad (6)$$

$$GINI_{it} = \alpha_0 + \alpha_1 EG_{it} + \alpha_2 FD_{it} + \alpha_3 INS_{it} + \alpha_4 X_{it} + \varepsilon_{it} \quad (7)$$

Model (5) indicates that inequality, economic growth and their interactive term directly affect poverty. The expected effect of inequality on poverty is positive, while the expected effect of economic growth on poverty is negative. The interactive effect can be positive or negative depending upon the relative strength of growth and inequality effects on poverty.

The poverty reduction effect of financial development can depend on the quality of institutions. This idea can be formulated by including an interactive term of financial development and institutional quality. To model it empirically, we use another simulations equations model (8-10) as follows:

$$Pv_{it} = \alpha_0 + \alpha_1 GINI_{it} + \alpha_2 EG_{it} + \alpha_3 (GINI_{it} * FD_{it}) + \varepsilon_{it} \quad (8)$$

$$EG_{it} = \alpha_0 + \alpha_1 GINI_{it} + \alpha_2 FD_{it} + \alpha_3 (FD_{it} * INS_{it}) + \alpha_4 X_{it} + \varepsilon_{it} \quad (9)$$

$$GINI_{it} = \alpha_0 + \alpha_1 EG_{it} + \alpha_2 FD_{it} + \alpha_3 (FD_{it} * INS_{it}) + \alpha_4 X_{it} + \varepsilon_{it} \quad (10)$$

2. Data

The entire data set, except institutional measures, were retrieved from WDI (2014). The analysis is carried out using a panel of 79 developing and 35 developed countries over the period 1984-2013. Institutional quality is defined by taking an average of alternative measures of institutions. The measures include: (i) control of corruption (ranging from 0-6), (ii) government stability (ranging from 0-12), (iii) law and order (ranging from 0-6), (iv) democratic accountability (ranging from 0-6), and (v) bureaucratic quality (ranging from 0-4). The range 0 to 4/6/12 implies that the quality of institutions is improving. The data on institutional measures are collected from PRS' International Country Risk Guide (2013).

Table 1 shows the correlation matrix of the important variables used in the regression analysis. All the coefficients in relation to poverty have expected signs. Particularly, financial development and all measures of institutional quality have negative signs as predicted by theory. Table 2 shows summary statistics. Table 3 provides a correlation matrix among the institutional measures. It is observed that correlation among most institutional measures is greater than 50 per cent, indicating they share some common information and can aggregate to generate a single index.

Before embarking on the path of estimation, it is useful to understand the relationship of financial development and institutional quality with poverty using graphs. The pictorial analysis below helps to infer the results which are expected to be drawn from this study. It is evident from Figures 2 and 3 that there is a negative correlation between financial development measures and poverty, indicating that a higher level

TABLE 1

Correlation Matrix of Important Variables

	HCR 1.25	GINI	Growth	Credit/ GDP	BB	CC	LO	DE	BQ	GS
HCR 1.25	1									
GINI	0.594	1								
Growth	-0.027	-0.121	1							
Credit/ GDP	-0.462	-0.284	-0.19	1						
BB	-0.52	-0.164	-0.034	0.672	1					
CC	-0.241	-0.225	-0.279	0.56	0.411	1				
LO	-0.512	-0.581	-0.031	0.572	0.347	0.541	1			
DE	-0.247	0.007	-0.206	0.439	0.526	0.486	0.303	1		
BQ	-0.415	-0.226	-0.273	0.679	0.617	0.675	0.521	0.586	1	
GS	-0.011	-0.159	0.185	-0.027	-0.111	-0.017	0.076	-0.372	-0.185	1

Source: Authors' estimation.

of financial development is beneficial to the poor. Similarly, from Figures 4-7, alternative measures of institutional quality have negative slopes indicating that higher quality of institutions leads to lower poverty rates.

TABLE 2

Summary Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
HCR 1.25	868	1.173267	2.108667	-4.60517	4.540525
GINI	933	40.57723	10.51722	16.23	74.33
Economic Growth	3128	0.018669	0.057167	-0.6503	0.916728
Pvt. Credit/GDP	3093	3.275217	1.015229	-1.86913	5.739995
BB	940	2.300385	1.155202	-2.0418	4.656319
CC	3167	2.967148	1.33831	0	6.166667
LO	3167	3.547213	1.472166	0	6
DE	2602	3.873314	1.562872	0	6
BQ	3167	2.103273	1.195387	0	4
GS	2600	7.524394	2.206774	1	12
Institutions	3167	2.695272	1.045201	0.319444	4.972222

Source: Authors' estimation.

TABLE 3

Correlation Matrix of Institutional Measures

	CC	LO	DE	BQ	GS
CC	1				
LO	0.6518	1			
DE	0.5637	0.5836	1		
BQ	0.6782	0.6804	0.6867	1	
GS	0.1109	0.3723	0.2275	0.2329	1

Source: Authors' estimation.

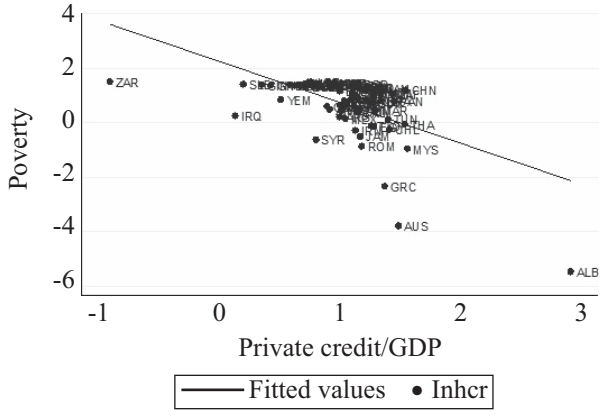

FIGURE 2

Relationsip between Poverty & Financial Development

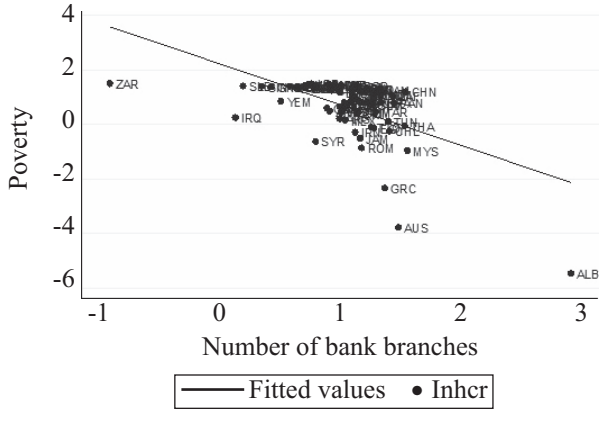

FIGURE 3

Relationsip between Poverty & Financial Development

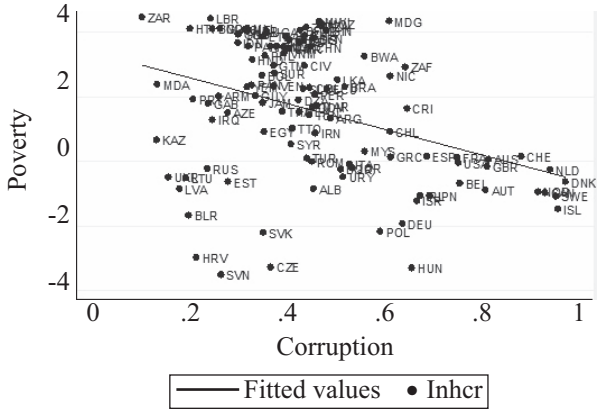

FIGURE 4

Relationsip between Poverty & Corruption

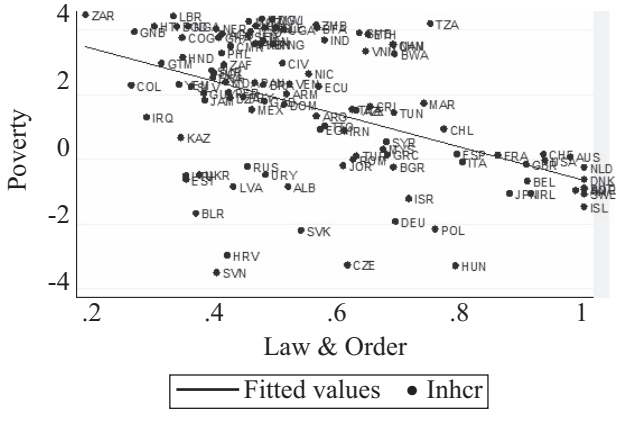

FIGURE 5

Relationsip between Poverty & Law and Order

3. Estimation

In the study, use of OLS requires fulfilment of the 'zero conditional mean' assumption. This assumption is violated in three instances: endogeneity defined as the simultaneous determination of explanatory variable/s and explained variable, omitted variable bias and the measurement error in explanatory variables. These all problems arise due to different reasons, but they all have a common solution, the use of instrumental variable technique.

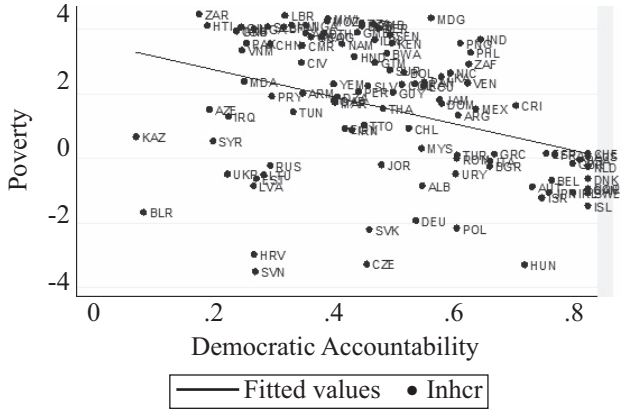

FIGURE 6

Relationsip between Poverty & Democratic Accountability

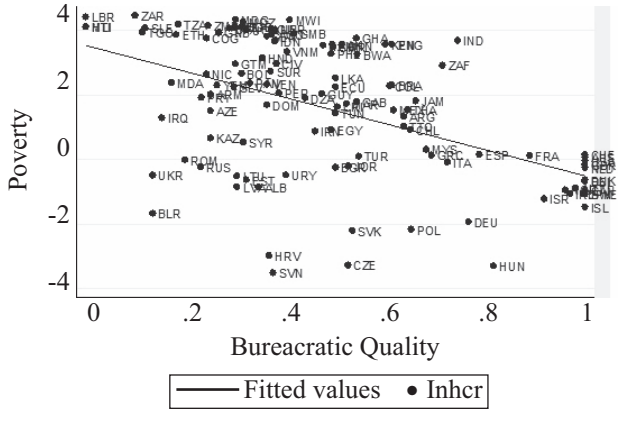

FIGURE 7

Relationsip between Poverty & Bureacratic Quality

Furthermore, it is found in the literature that financial development and institutional quality are endogenous variables. A higher level of financial development and institutions promote poverty reduction; on the other hand, a lower level of poverty provides a favourable ground for establishing good institutions and financial system. Therefore, OLS will produce biased estimates because the Model suffers from the issue of endogeneity. To address the issue of endogeneity, omitted variables, measurement errors and heteroscedasticity, we use 2SLS and system GMM developed by Blundell and Bond (1998).

The system GMM is based on first differenced GMM where lag of dependent variable is introduced to remove any time-invariant country-specific effect and then endogenous variables are instrumented using lagged values one period or more [Bond, et al. (2001)]. Besides using internal/lag instruments, we also use external instruments. On the basis of existing literature, we have used ethnolinguistic fragmentation index (ELF) and colonial origin as instruments for financial development and institutions. The widely used instruments for financial development are ELF and legal origin [Levine (1999), Beck, et al. (2007)]. The commonly used instrument for institutions, on the other hand, is of colonial origin [La Porta, (1999), Tebaldi and Mohan (2010)].

Because of a close relationship between colonial legacy and legal origin, we use colonial origin in place of legal origin, following Klerman, et al. (2009). Colonial origin performs better than legal origin [Klerman, et al. (2009)]. It is the colonial origin which shapes a country's legal origin which in turn is transmitted to economic growth and then to poverty. The arguments by Klerman, et al. (2009) suggest that colonial origin can be well used in place of legal origin. However, the regression using the legal origin as an instrument is also presented. The validity of ELF and colonial origin as instruments for financial development and institutions is checked by Hansen test of over-identifying restrictions.

IV. Empirical Results and Discussion

Table 4 shows regression results obtained using the 2SLS technique. The empirical results confirm a negative relationship of financial and institutional development with poverty. Model 1 of Table 4 shows that the coefficient of financial depth (Private credit/GDP) is negative and highly significant, indicating that the provision of credit to the poor helps in reducing poverty. The coefficient of financial depth implies that a one per cent increase in the financial depth reduces the poverty by 0.90 percentage points. Control variables have standard signs from all Models (1-8), as predicted by the literature. Unequal income distribution worsens poverty rates and a higher level of economic growth combats poverty.

Models 2 to 7 include institutional measure one by one and a simple average of these measures following Chong and Calderon (2000). All measures of institutional quality have a negative and significant relationship with poverty. Good quality of institutions as measured by reduction in corruption, improvement in law and order situation, government stability, democratic accountability and bureaucratic quality is an important factor contributing to lower poverty [Chong and Calderon (2000), Tebaldi and Mohan (2010)]. Model 7 uses an aggregate index of five institutional measures. The index is generated by normalizing the measures between 0 and one and then taking their simple average [Chong and Calderon, (2000)]. It is observable that the institutional index (INS) has a minus sign which is highly significant. The coefficient of institutional quality implies that a one-standard-deviation increase in the institutional quality reduces poverty by 0.25 points.

TABLE 4

2SLS Estimation Results for the Impact of Financial and Institutional Development on Poverty

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Dependent variable is poverty head count ratio								
GINI	0.0724***	0.0619***	0.0549***	0.0665***	0.0578***	0.0758***	0.0583***	0.0578***
	-0.00583	-0.00595	-0.00643	-0.00562	-0.00573	-0.00618	-0.0059	-0.00604
EG	-0.0166	-0.0274*	-0.0157	-0.0156	-0.0236*	-0.00896	-0.0172	-0.0189
	-0.0148	-0.0147	-0.0146	-0.0145	-0.0142	-0.0163	-0.0145	-0.0146
FD	-0.900***	-0.787***	-0.726***	-0.593***	-0.517***	-0.863***	-0.719***	-0.386***
	-0.0682	-0.0686	-0.0728	-0.0688	-0.0766	-0.0718	-0.0689	-0.0995
CC		-0.309***						
		-0.0538						
LO			-0.290***					
			-0.0518					
DE				-0.539***				
				-0.0456				
BQ					-0.608***			
					-0.0677			
GS						-0.0871**		
						-0.0371		
INS							-0.553***	
							-0.0694	
FD*INS								-0.130***
								-0.0188
Constant	1.544***	2.557***	2.729***	3.046***	2.215***	1.932***	3.093***	1.711***
	-0.374	-0.403	-0.418	-0.385	-0.361	-0.471	-0.408	-0.367
Cragg-Donald Wald F statistic	2617.401	726.96	992	707.78	870.22	207.12	484.74	699.09
Cumby-Huizinga test	0.35	0.12	0.05	0.13	0.28	0.84	0.21	0.18
Obs.	695	693	693	586	693	586	693	692
R-squared	0.362	0.392	0.391	0.498	0.432	0.381	0.404	0.393

Source: Authors' estimation.
Notes: Standard errors in parentheses.
*** p<0.01

The combined effect of institutional quality and financial development is negative and significant, implying that higher quality of institutions facilitates poverty reduction impact of financial development. From all Models (1-8), it can be observed that control variables have standard signs as predicted by the literature. The Cumby-Huizinga test is applied to test the correlation in the error term. The results reported for the Cumby-Huizinga test in Table 4 indicate that the results are not suffering from the problem of correlation in the error term. The Cragg Donald F stats are reported to check the validity of instruments and correlations in error. The values of Cragg Donald F stats support the validity of instruments.

The (negative or positive) impact of financial development on poverty is modified (strengthened or weakened) with a multiplicative interaction term. It is clear from Model 8 of Table 4 that the coefficient of financial development is negative, and the coefficient of interaction terms is also negative, illustrating that the negative impact of financial development on poverty increases with higher institutional quality. In other words, institutions reinforce the ability of financial development to fight against poverty by ensuring that benefits of credit extension reach to poor and productive activities.

Table 5 reports the estimation results obtained using system GMM. The instruments used are ELF, colonial legacy and legal origin (Model 3) and the validity of instruments is checked by Hansen test of over-identifying restrictions. The null hypothesis is that instruments are uncorrelated with residuals. Test results in Tables 5-6 show that null hypothesis in all models cannot be rejected, which demonstrates exogeneity and validity of the instruments. The first and second-order serial correlations are tested following Arrelano and Bond's first (AR1) and second-order serial correlation (AR2) tests. The test results reported in Tables 5-6 indicate that p-values for both tests are greater than 5 per cent, indicating that the results are not suffering from correlation in error.

In Model 1 (Table 5) initial level of poverty (L. dependent variable) is introduced to test the convergence effect, which assumes that poverty falls more rapidly when initial poverty is low. Since lagged dependent variable is positively correlated[2] with poverty, there is evidence for convergence. Financial development has an insignificant impact on poverty which, however, is negative. One problem of using this specification is that inclusion of lagged dependent variable on the independent side results in a great loss of observations.

Model 2 and Model 3 shows estimation results when we drop lagged dependent variable the results conform to baseline findings. Both variables of concern, financial development and institutional quality, have a negative and significant relationship with poverty.

The coefficient of financial depth shows that a one per cent increases in the financial depth reduces the poverty by 1.56 percentage points. Model 3 presents results

[2] Convergence coefficient is equal to the coefficient of initial poverty minus 1. [Jeanneney and Kpodar (2011)].

TABLE 5

System-GMM Estimation Results for the Impact of Financial (Credit to the Private Sector) and Institutional Development on Poverty

	Model 1	Model 2	Model 3	Model 4	Model 5
Dependent variable is poverty head count ratio					
L. dependent	0.108**				
	-0.0524				
GINI	0.0904***	0.0627*	0.0476	0.0263	0.0237
	-0.0308	-0.0359	-0.0306	-0.0295	-0.0297
EG	-0.0316***	-0.0807	-0.0841	-0.0653**	-0.0705**
	-0.0119	-0.0506	-0.0533	-0.0323	-0.0325
FD	-0.438	-1.562***	-1.525***	-1.783***	-1.535***
	-0.285	-0.293	-0.212	-0.268	-0.247
INS			-1.298**	-2.060***	
			-0.601	-0.799	
FD*INS					-0.520**
					-0.219
Constant	-2.328	4.406*	5.683***	7.865***	7.017***
	-1.989	-2.311	-1.891	-1.72	-1.697
Observations	254	703	699	699	699
No. of instruments	31	87	60	60	60
No. of countries	37	98	98	98	98
AR1	0.07	0.02	0.05	0.06	0.05
AR2	0.33	0.11	0.11	0.17	0.15
Hansen test	0.77	0.66	0.56	0.56	0.93

Source: Authors' estimation.
Notes: Robust standard errors in parentheses. The instruments used are ethno-linguistic fragmentation index and colonial legacy. Model 3 is regressed using ethno-linguistic fragmentation index and legal origin.
*** p<0.01, ** p<0.05, * p<0.1.

using the legal origin as an instrument, and Model 4 uses colonial legacy as an instrument. It can be observed that both model yields similar results with a bit of difference in the size of the coefficients. We have used colonial legacy and ELF as an instrument in further specifications. With regard to control variables, GDP per capita growth has a negative coefficient varying between 0.04 per cent (Model 1) and 0.084 per cent (Model 3). Income inequality has a positive coefficient in all models, which is insignificant somewhere, indicating that income distribution may or may not be an important contributor to rising poverty. Model 5 shows estimation results for the joint effect of

financial development and institutions on poverty. We observe that financial development has a negative coefficient and the interaction terms are also negative, indicating that improvement in the quality of institutions fosters the negative impact of financial development on poverty.

Table 6 reports the results for poverty using bank branches as a measure of financial development. Moreover, Table 6 reports the results using other determinants of poverty. Model 7 and 8 produce Model 3 and 4, where a new link is explored between financial depth, financial access and poverty. The results indicate that both depth (FD) and access (BB) of financial development matter for poverty reduction. From Model 7, the coefficient of BB is negative and statistically significant, implying that increased access to banks reduces poverty. It implies because opening more commercial bank

TABLE 6

GMM Estimation Results for the Impact of Financial (Bank Branches) and Institutional Development on Poverty

	Model 6	Model 7	Model 8
Dependent variable is poverty head count ratio			
GINI	0.0761**	0.0915***	0.0834***
	-0.036	-0.03	-0.0315
EG	-0.0375	0.0601	0.0396
	-0.0574	-0.049	-0.0453
FD	-1.893***	-1.606***	-1.488***
	-0.338	-0.236	-0.253
INS		-2.376**	
		-0.98	
FD*INS			-0.565**
			-0.242
Constant	2.782	2.168	2.155
	-1.987	-1.426	-1.519
Observations	251	251	247
Number of instruments	26	37	37
Number of countries	82	82	82
AR1	0.53	0.27	0.28
AR2	0.93	0.72	0.75
Hansen test	0.3	0.62	0.6

Source: Authors' estimation.
Notes: Robust standard errors in parentheses.
*** p<0.01, ** p<0.05.

branches in less developed areas increases the poor's access to credit and raise their living standard.

Now we include interaction term to examine the role played by banks coverage in reinforcing financial development (depth). Results are shown in Model 8, the interaction term FD*BB is negative and significant, indicating that increased access of the financial sector (by opening more banks) reinforce the ability of financial development to reduce poverty. Finally, to assess the robustness of the results, other determinants of poverty included in the Model (Table A-1 of Appendix). The results show that the inclusion of other covariates of poverty does not alter the significance of our main variables. All the control variables have expected signs. Population growth and human development have a significant impact on poverty; others are insignificant in explaining poverty.

Table 7 shows estimations mainly for developing countries. Both financial system and institutions are well established in developed countries, as indicated by Jeanneney and Kpodar (2011) and Chong and Calderon (2000). On the other hand, the developing countries have different indicators of financial development, and many LDCs are at the early stages of institutional development. Different indicators and early stage of development these reasons motivated us to a separate analysis on developing countries.

The estimation yields a bit different result as compared to Table 4. Income inequality and economic growth possess standard signs, as indicated by the literature. Both variables are significant in explaining poverty. Models 1 to 5 show regression results when we added each institutional measure one by one. Table 7 shows that all measures of institutional quality are negatively and significantly correlated with poverty except CC and GS, which are insignificant. Our results regarding the impact of corruption and government stability are in line with [Tebaldi and Mohan (2010) and Pareera and Lee (2013)].[3]

Table 7 shows that three institutional measures, LO, DE and GE, have a significant impact on poverty reduction. Therefore, the institutional index is a composite of these three measures. The impact of financial development on poverty in all models is less than institutional quality measures. In developing countries, institutions play a vital role in reducing poverty and their impact on poverty is stronger than financial development. Besides having a direct impact on poverty reduction, institutions also augment the negative impact of financial development on poverty. It is evident from Model 7, where the interaction term enters with a negative and significant sign indicating that institutions foster the ability of banking system to alleviate poverty.

Table 8 reports the results of the simultaneous equation model (5-7). The empirical estimates for the poverty equation indicate that economic growth is good for the poor as increasing growth rates significantly lower poverty incidence. However, the effect of unequal distribution of income is positive and significant, implying that higher inequality also causes higher poverty. Thus the favourable impact of growth

[3] For justification and detail see, Tebaldi and Mohan (2010) and, Pareera and Lee (2013).

on poverty is offset as a consequence of increasing inequality. Nevertheless, the iterative term of growth and inequality indicates that, on average net impact of growth and inequality is favourable for the poor.

The empirical results for the growth equation show that growth impact of institutions is positive and significant at a 5 per cent level of significance. This finding implies that one unit improvement in the quality of institutions leads to a 0.45 per

TABLE 7

Estimation Results for Developing Countries

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
The dependent variable is poverty headcount ratio							
GINI	0.0583***	0.0552***	0.0639***	0.0589***	0.0530***	0.0676***	0.0622***
	-0.00689	-0.00665	-0.0072	-0.00662	-0.00704	-0.00666	-0.00658
EG	-0.0278**	-0.0208	-0.046***	-0.033**	-0.042***	-0.012	-0.019***
	-0.0138	-0.0138	-0.0149	-0.0143	-0.0149	-0.0129	-0.013
FD	-0.019***	-0.031***	-0.024***	0.0051	-0.024***	-0.013**	-0.0113
	-0.00663	-0.00687	-0.00631	-0.00892	-0.0069	-0.0063	-0.00734
CC	-0.00153						
	-0.0663						
LO		-0.199***					
		-0.0537					
DE			-0.259***				
			-0.0521				
BQ				-0.235***			
				-0.0474			
GS					-0.0181		
					-0.0287		
INS						-0.328***	
						-0.0806	
FD*INS							-0.0143
							-0.0094
Constant	-0.653*	0.105	0.229	-0.268	-0.12	1.092***	-0.884***
	-0.335	-0.378	-0.359	-0.326	-0.397	-0.313	-0.312
Observations	620	620	521	609	523	627	627
R-squared	0.172	0.19	0.226	0.194	0.191	0.192	0.173

Source: Authors' estimation.
Notes: Standard errors in parentheses.
*** p<0.01, ** p<0.05.

cent increase in economic growth. This finding is consistent with many cross-country studies [Scully (1998), Acemoglu, et al. (2001), and Knack and Keefer (1995)]. Institutions boost economic growth by creating a fair and efficient distribution of limited available resources. The studies show that higher quality of institutions has better effects on investment, economic growth, inequality level of a country and ultimately on poverty. The effect of financial development is also positive. The impact of infla-

TABLE 8

Simultaneous Equation Model

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VAR	Simultaneous Equation Model 1			Simultaneous Equation Model 2			Simultaneous Equation Model 3		
	Equ. 5	Equ. 6	Equ. 7	Equ. 5	Equ. 6	Equ. 7	Equ. 5	Equ. 6	Equ. 7
	Poverty	Growth	Inequality	Poverty	Growth	Inequality	Poverty	Growth	Inequality
GDPPC (t-1)		-0.283*			-0.212			-0.147	
		-0.16			-0.157			-0.167	
FD		0.0594	0.311		-0.313	0.972*		-0.241	1.992***
		-0.222	-0.512		-0.226	-0.523		-0.264	-0.599
INS		0.452**	-1.586***		0.458**	-1.791***		0.117**	-0.522***
		-0.194	-0.449		-0.191	-0.443		-0.0518	-0.118
Inflation		-0.0031***			-0.0024**			-0.0029***	
		-0.00105			-0.00103			-0.00105	
EG	-0.565***		-1.177***	-0.561***		-1.225***	-0.574***		-0.466
	-0.159		-0.37	-0.159		-0.364	-0.161		-0.379
GINI	0.166***			0.167***			0.163***		
	-0.0346			-0.0346			-0.0351		
EG*GINI	-0.0107**			-0.0108**			-0.0103**		
	-0.00422			-0.00422			-0.00428		
Trade					0.0247***	-0.0508***			
					-0.00417	-0.00961			
Govt. Exp.								-0.0825**	-0.348***
								-0.0344	-0.078
Constant	2.429*	3.863***	54.95***	2.402*	2.748***	57.42***	2.503*	5.129***	49.18***
	-1.328	-0.933	-2.159	-1.328	-0.936	-2.17	-1.344	-1.11	-2.532
Observations	794	794	794	791	791	791	786	785	786
R-squared	0.64	0.18	0.64	0.648	0.59	0.098	0.644	0.7	0.87

Source: Authors' estimation.
Notes: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

tion is negative and significant. Since inflation is an indicator of macroeconomic instability, its effect on growth is negative.

The empirical results for the inequality equation indicate that the quality of institutions causes an inequality bridging effect. This effect is significant at a 10 per cent level of significance. Sound institutions enforce property rights, justice, equity and economic efficiency; good quality institutions lead towards higher levels of economic growth and provide a fertile ground for equal distribution of income. The effect of financial development is also positive; however, it is statistically insignificant [Majeed and Zhang (2014), Majeed (2016)]. Chong and Calderon (2000) and Chong and Gradstein (2007) demonstrate that institutions play a vital role in reducing poverty because good quality institutions support equal income distribution.

The results obtained using a system of equation model supports our finding based on single-equation modelling. In the case of single equation modelling, financial development and the quality of institutions directly affect poverty. In contrast, in the simultaneous equation model, financial development and institution quality affect poverty through growth and inequality; moreover, finance and institutions improve growth, lowering poverty. Similarly, finance and institutions increase inequality that in turn increases poverty incidence. The combined effect of growth and inequality is poverty reduction that confirms baseline results that are quality of institutions and financial development are the major sources of poverty reduction both directly and indirectly. Simultaneous Equation model 2 and 3 include some additional control variables such as trade and government expenditures to assess the robustness of model 1. These models also confirm the baseline finding that institutions boost growth and lower inequality, reducing poverty. The combined effect of growth and inequality on poverty is consistently negative and significant in all simultaneous equation models.

Finally, Table 9 reports the simultaneous equation model (8-10) using the interactive effect of financial development and the quality of institutions. The iterative effect of financial development and intuitional quality is positive and significant in all growth equations, implying that the quality of institutions and financial development jointly enhance economic growth, reducing poverty. Similarly, the interactive effect of financial development and institutional quality significantly ameliorates inequality which in turn reduces poverty. Thus, we can conclude that the quality of institutions reinforces the ability of financial development to reduce poverty.

V. Conclusion

This study aims to examine the joint effect of financial development and institutional quality on poverty. In other words, the study has been conducted to answer critical the question of whether institutions reinforce or strengthen the impact of financial development on poverty. To achieve the objectives of this study, we have used 2SLS and system GMM on a sample of selected developed and developing countries over

the period 1984-2013. This study emphasizes the importance of sound institutional structure in the finance-poverty nexus. As a result, we find that institutions have a positive impact on poverty reduction and reinforce the ability of the financial system to reduce poverty. Furthermore, our results indicate that financial development has a greater effect on poverty reduction when the financial system is enclosed in a strong institutional framework.

TABLE 9

Simultaneous Equation Model (Interactive Effect of Financial Dev. and Institutions)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VAR	Simultaneous Equation Model 1			Simultaneous Equation Model 2			Simultaneous Equation Model 3		
	Equ. 8	Equ. 9	Equ. 10	Equ. 8	Equ. 9	Equ. 10	Equ. 8	Equ. 9	Equ. 10
	Poverty	Growth	Inequality	Poverty	Growth	Inequality	Poverty	Growth	Inequality
GDPPC (t-1)		-0.270*			-0.207			-0.147	
		-0.161			-0.157			-0.167	
FD		-0.236	1.778***		-0.631**	2.620***		-0.241	1.992***
		-0.261	-0.597		-0.265	-0.609		-0.264	-0.599
FD*INS		0.110**	-0.547***		0.116**	-0.604***		0.117**	-0.522***
		-0.0514	-0.118		-0.0505	-0.116		-0.0518	-0.118
Inflation		-0.00304***			-0.00239**			-0.00292***	
		-0.00105			-0.00103			-0.00105	
EG	-0.565***		-0.977***	-0.561***		-1.024***	-0.574***		-0.466
	-0.159		-0.369	-0.159		-0.362	-0.161		-0.379
GINI	0.166***			0.167***			0.163***		
	-0.0346			-0.0346			-0.0351		
EG*GINI	-0.0107**			-0.0108**			-0.0103**		
	-0.00422			-0.00422			-0.00428		
Trade					0.0248***	-0.0517***			
					-0.00418	-0.00955			
Govt. Exp.								-0.0825**	-0.348***
								-0.0344	-0.078
Constant	2.429*	4.958***	49.25***	2.402*	3.922***	51.15***	2.503*	5.129***	49.18***
	-1.328	-1.1	-2.533	-1.328	-1.093	-2.521	-1.344	-1.11	-2.532
Observations	794	794	794	791	791	791	786	786	786
R-squared	0.648	0.17	0.74	0.648	0.58	0.11	0.644	0.23	0.2

Source: Authors' estimation.
Notes: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.

While mainly focusing on developing countries, we find that in these countries, institutions are more potent than financial development in reducing poverty. In developing countries, the integral institutional measures are improvement of law and order, democratic accountability, and bureaucratic quality. The interaction term is significantly negative, indicating that institutions strengthen the ability of financial development to alleviate poverty in developing countries.

Another finding that emerged from the study is that both the access and depth of the financial sector matter for poverty reduction. Increased access to banking services, as measured by an increase in commercial bank branches, improves/reinforces financial development, which is suitable for poverty reduction.

Finally, this study also isolates the indirect effects of institutions and financial development on poverty using a simultaneous equation model. The results obtained using a system of equations reinforces the findings obtained using a single equation model. That is quality of institutions boosts economic growth that in turn reduces poverty. In the same way, institutional development ameliorates unequal distribution of income that in turn ameliorates poverty. Thus, institutional development not only directly contributes to lower poverty but also through ameliorating inequality and boosting economic growth.

The study demonstrates that institutional quality, ignored in the finance-poverty nexus, is an important variable in explaining the differences in poverty worldwide. Besides having an independent impact on poverty reduction, institutions also affect the ability of financial development to reduce poverty. Low-quality institutions hinder the effectiveness of the banking system. Therefore, the study recommends building sound institutions, especially in developing countries, to derive maximum gains from financial development. To bring more people into `financial development net' policies should be focused on increasing the poor's access to credit, opening more commercial bank branches in the poorest areas, and ensuring good quality of institutions. The sound institutional framework not only increases the efficiency of financial development to reduce poverty; it also ensures efficient delivery of social services to the poor. Moreover, sound institutions also reduce poverty indirectly by boosting economic growth and ameliorating inequality.

1. Research Limitations

This study works with the 2014 WDI using $1.25 (income) per person as a poverty cut-off. For some years, and most recently in the 2017 WDI, a $1.90 cut-off has been used. Therefore, future research can examine the poverty-finance nexus using a $1.90 cut-off or compare alternative cut-off results. The empirical literature, aggregate poverty is also measured by average per capita income of the poorest 20 per cent of the population; however, this measure is not considered in this study. This research uses two measures of financial development that credit to the private sector and bank branches; future research can use other better measures of financial development.

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APPENDIX

TABLE A-1

System GMM Estimation Results
Including other Determinants of Poverty

Variables	System GMM
GINI	0.105***
	(-0.0245)
EG	-0.0334
	(-0.0241)
FD	-0.959***
	(-0.277)
FD*INS	-0.363*
	(-0.2200)
CPI	-0.00013
	(-0.00053)
Trade	0.116
	(-0.641)
Population	0.628***
	(-0.235)
GC	-0.473
	(-0.758)
HD	-2.990***
	(-0.8900)
Constant	5.271
	(-8.281)
Observations	563
Number of countries	90
AR1	0.056
AR2	0.517
Hansen test	1.000

Source: Authors' estimation.

TABLE A-2

List of Countries

Albania	Denmark	Iceland	Norway	Switzerland
Australia	Estonia	Ireland	Poland	Syrian Arab Rep.
Austria	Finland	Israel	Russian Federation	Trinidad & Tobago
Belgium	France	Italy	Slovak Republic	Turkey
Burkina Faso	Germany	Japan	Slovenia	United Kingdom
Canada	Greece	Latvia	Spain	United States
Czech Republic	Hungary	Netherlands	Sweden	Uruguay
Algeria	Croatia	Jamaica	Papua New Guinea	Venezuela, RB
Argentina	Dominican Rep.	Jordan	Paraguay	Vietnam
Armenia	Ecuador	Kazakhstan	Peru	Yemen, Rep.
Azerbaijan	Egypt, Arab Rep.	Kenya	Philippines	Zambia
Bangladesh	El Salvador	Liberia	Romania	Angola
Belarus	Gabon	Lithuania	Sierra Leone	Congo, Dem. Rep.
Bolivia	Gambia, The	Malaysia	South Africa	Congo, Rep.
Botswana	Ghana	Mexico	Sri Lanka	Ethiopia
Brazil	Guinea	Moldova	Suriname	Guatemala
Bulgaria	Guinea-Bissau	Morocco	Tanzania	Haiti
Cameroon	Guyana	Mozambique	Thailand	Madagascar
Chile	Honduras	Nicaragua	Togo	Namibia
China	India	Niger	Tunisia	Romania
Colombia	Indonesia	Nigeria	Turkey	Senegal
Costa Rica	Iran, Islamic Rep.	Pakistan	Uganda	Ukraine
Cote d'Ivoire	Iraq	Panama	Ukraine	

Source: Authors' estimation.