Finance, Inequality, and Poverty Revisited: A Threshold Model Approach

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***Abstract*—There have been significant influences of financial development on the income growth of the poor, the reduction of income inequality, and a decrease in the number of people who live on less than $1 per day. These effects were explored by Beck, Demirguc-Kunt, and Levine in their Finance, Inequality, and Poverty paper that examines the income growth of the poorest quintile, overall income inequality, and the number of people living on less than $1 per day. Our research derives from this paper with the addition of quantifiable measures of financial development using threshold estimations. We further examine threshold values using an instrumental variable estimation to account for endogeneity bias. The results from our cross-country analyses allow us to make comparisons between different countries regarding the necessary measure of financial development that is needed for growth in the poorest sectors of each economy.**

Keywords- Financial Development, Income Distribution, Instrumental Variable Estimation, Poverty, Threshold Estimation

INTRODUCTION

Previous research and numerous papers suggest that financial development accelerates economic growth. Beck, Demirguc-Kunt, and Levine's paper on Finance, Inequality and Poverty examines this theory using concepts of income and economic growth to measure the effects of financial development. However, unlike previous research that examines the relationship between finance and economic growth, their paper provides an insight to whether financial development specifically reduces poverty rates in the poorest sectors and whether it influences income distribution in cross-examined countries.

Since our paper derives from the Finance, Inequality and Poverty paper, the primary topics that we evaluate relate to the income growth of the poor, income inequality, and the number of people who survive on less than a dollar per day. Similar to that of Beck, Demirguc-Kunt, and Levine's paper, we focus on the financial development of the poorest sectors of each economy rather than its effects on the overall economic development of that country. The measurement of income distribution in this paper uses the growth rate of the Gini coefficient which is a number between 0 and 1 that is used to measure income inequality. A value of 0 observes perfect income equality while a Gini coefficient of 1 suggests complete income inequality within the economy. The growth of the headcount ratio depicts the percent of the population that lives on a $1 per day or less. These derived concepts from [1] differ from previous research that examines the relationship between finance, inequality, and poverty. Most research, including [2], targets a broader population while [1] specifically targets the poorest quintile of the examined countries. Galor and Zeira's paper, on the other hand, uses similar research topics but consider the effects of income distribution in a macroeconomic perspective through human capital investment instead of several different economic influences in their Income Distribution and Macroeconomics paper. Their conclusions illustrate that finance plays a role in the distribution of wealth through capital market imperfections for which an increase income allows an individual to invest a larger percentage of human capital [3].

We use a threshold estimation model in our research to prove a nonlinear relationship between financial development and the income growth of the poor, the growth of the Gini coefficient, and the growth of the headcount ratio. Greenwood and Jovanovic previously examined this non-linear relationship using the Kuznet's curve to prove that non-linear estimations can be used to evaluate the relationship between financial development and income inequality [4].

The results of our threshold estimations generated significant relationships between finance and the income growth of the poor as well as the growth of the Gini coefficient. We further investigated the validity of the threshold value using IV (instrumental variable) estimation to account for endogeneity bias between financial development and the specified economic disparities.

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DATA

The data for this paper is extracted from two different datasets that correspond to the threshold estimation variables and IV estimations. Data for the threshold model is parallel with the Finance, Inequality, and the Poverty paper while Levine, Loayza, and Beck's paper on Financial Intermediation and Growth provide a panel dataset with variables used for the instrumental variable estimation [5].

The income growth of the poorest quintile captures the effects of financial development in the poorest sector of countries. It is computed using the log difference between the last and first observation of the average income per capita of the lowest quintile and dividing by the number of years for the observed variables between 1960 and 1999. This calculation allows us to focus specifically on the income growth of the poorest sector rather than the overall GDP of countries. Similarly, the growth of the Gini coefficient is calculated by computing the difference between the log of the first and last observations and dividing that by the number of years between the two observations from 1960 to 1999. Poverty is measured by calculating the growth of the headcount ratio which equals the rate of growth of the population living at or under $1 per day. Once again, the log difference of the first and last observations is divided by the number of years between the two observations and is used to determine headcount growth numbers between 1980 and 2000. Private credit is used as a measure of financial development and is observed as the proportion of GDP issued by financial institutions to private firms. Average GDP per capita growth is controlled in this analysis to measure the impact of financial development on the distribution of income rather than the overall economic growth of the country. The cross-examined countries in Table 4 are derived from that of Beck, Demirguc-Kunt, and Levine's paper [1].

METHODOLOGIES

Our paper focuses on a sample splitting threshold model to quantify the conclusions of the dependent variables. We use threshold estimation methods to split our sample for values of private credit that lie below and above the determined threshold value. This model becomes relatively complex when threshold values are unknown in which case the threshold model uses the form:

$$(1) \quad y_i = \theta_1' x_i + e_i \qquad q_i \le \gamma$$
$$(2) \quad y_i = \theta_2' x_i + e_i \qquad q_i > \gamma$$

where q_i separates the sample into two groups and is referred to as the threshold variable and γ is the threshold estimate. We use private credit as q_i and γ as the value of the threshold estimate [6].

When problems such as omitted variable bias, measurement errors, or simultaneity bias occur, it is important to note that the explanatory variable becomes correlated with the error term. To resolve this issue, an instrumental variable is introduced into the equation. This new variable (the IV variable) must be correlated with the explanatory variable and simultaneously uncorrelated with the error term [7]. IV estimations are essential for this paper as reverse causality can occur between financial development and income distribution and poverty. We assume that financial development influences income distribution and poverty, however, reverse causation can occur if the reduction of poverty increases the demand for private credit [8]. The instrumental variables used for our research include latitudes and civil laws of the examined countries. The measurement of latitude refers to the latitude of the capital city of each observed country normalized between zero and one. Latitude serves as a feasible exogenous national characteristic for the influence of financial development in order to depict the countries that have temperate areas where agriculture can flourish more productively which bring prosperity to the economies. The legal origins of countries are used to determine the type of legal system (British law versus French, German, Scandinavian civil or Socialist law) that promotes private credit [1].

The following equations for threshold estimations are derived from [1]. The equation for the income growth of the poor is as follows:

$$(y_{i,p,t} - y_{i,p,t-n})/n = \alpha(y_{i,t} - y_{i,t-n})/n + \beta FD_i + \gamma X_i + \lambda y_{i,p,t-n} + \varepsilon_i$$

$y_{i,p,t}$ is the average per capita income of the poorest quintile while $y_{i,t}$ is the average GDP per capita and "i" and "t" represent the country and year respectively. FD_i refers to the measure of financial development for which we use private credit and X_i is the set of country-specific variables which includes schooling in 1960 to account for initial human capital, inflation to account for macroeconomic changes, and trade openness to examine international relations. The equation for the growth of the Gini coefficient contains similar variables with the exception of $G_{i,t}$ for the Gini coefficient and is as follows:

$$(G_{i,t} - G_{i,t-n})/n = \alpha(y_{i,t} - y_{i,t-n})/n + \beta FD_i + \gamma X_i + \lambda G_{i,t-n} + \varepsilon_i$$

The growth of the headcount ratio, $P_{i,t}$, also has similar regression specifications with the addition of age dependency and population growth that is included in X_i. The equation for the growth of the headcount ratio is the following:

$$(P_{i,t} - P_{i,t-n})/n = \alpha(y_{i,t} - y_{i,t-n})/n + \beta FD_i + \gamma X_i + \lambda P_{i,t-n} + \varepsilon_i$$

RESULTS

I. INCOME GROWTH OF THE POOR

As our research is parallel with that of the Finance, Inequality and Poverty paper, we check that our non-threshold OLS regression estimations exhibit similar relationships to that of [1] between financial development and the dependent variable. When using income growth of the poor, our non-threshold estimation for private credit shows a positive and significant relationship between the dependent variable and is similar to the result in [1]. The results of [1] and our private credit estimation (0.28) is significant at the 1% significance level. Table 1.1 summarizes our results for the OLS regression with significance levels. Table 1.2 and 1.3 comprises the

results obtained from the threshold estimation while Table 1.4 and 1.5 reports instrumental variable estimation results.

Our findings suggest that a threshold estimate that is above -0.01 is needed for private credit to have a positive influence on the income growth of the poor. Table 1.2 shows that 22 countries are at or below the threshold estimate and exhibit no significant relationship between private credit and income growth of the poor. Table 1.3 provides evidence that supports the significance of private credit values above the threshold level. This table shows that 26 countries have private credit values that are above -0.01 which can positively influence the income growth of the poor. The estimation of private credit is calculated at 0.33 and is significant at the 1% level. We further examined the validity of this threshold value using an IV estimation to correct for endogeneity bias and obtained a adjusted threshold estimate of -1.36. The new threshold estimate is shown in the IV estimation tables as private credit display a positive and significant relationship at the 1% significance level for private credit shares above the threshold value.

TABLE 1: INCOME GROWTH OF THE POOR

Income growth of the poor: growth rate of the income per capita of the poorest quintile between 1960 and 1999
Initial income of the poor: initial income per capita of the poorest quintile between 1960 and 1999
Growth of GDP per capita: growth rate of real GDP per capita between 1960 and 1999
Initial GDP per capita: logarithm of the real GDP per capita in 1960
Inflation: growth rate of the GDP deflator between 1960 and 1999
Trade openness: logarithm of the ratio of the sum of exports and imports to GDP averaged between 1960 and 1999
Schooling: logarithm of secondary school completion in 1960
Private credit: ratio of the value of credits transferred from financial intermediaries to private sectors between 1960 and 1999. [1]

TABLE 1.1

Global OLS Estimation: Without Threshold		
Dependent Variable: Income Growth of Poor Observations: 48 Degrees of Freedom: 40 R-squared: 0.88		
Variable	***Estimate***	***Standard Error***
Constant	1.04***	0.20
Initial Income of Poor	-0.17***	0.03
Growth of GDP per Capita	-0.0002	0.0006
Initial GDP per Capita	-0.0007	0.0006
Inflation	-0.0004	0.0006
Trade Openness	0.03	0.08
Schooling	-0.38***	0.08
Private Credit	0.28***	0.08

*** 1% significance level, ** 5% significance level, *10% significance level

TABLE 1.2

Threshold Estimation: Regime 1		
Threshold Variable: Private Credit Threshold Estimate: -0.01 Private Credit <= -0.01 Dependent Variable: Income Growth of Poor Observations: 22 Degrees of Freedom: 14 R-squared: 0.96		
Variable	***Estimate***	***Standard Error***
Constant	1.14***	0.40
Initial Income of Poor	-0.005	0.14
Growth of GDP per Capita	0.16***	0.05
Initial GDP per Capita	-0.06***	0.02
Inflation	-0.0003	0.0004
Trade	-0.11	0.10
Schooling (1960)	-0.04	0.11
Private Credit	0.17	0.20

*** 1% significance level, ** 5% significance level, *10% significance level

TABLE 1.3

Threshold Estimation: Regime 2		
Threshold Variable: Private Credit Threshold Estimate: -0.01 Private Credit > -0.01 Dependent Variable: Income Growth of Poor Observations: 26 Degrees of Freedom: 18 R-squared: 0.94		
Variable	***Estimate***	***Standard Error***
Constant	0.26	0.28
Initial Income of Poor	-0.05	0.04
Growth of GDP per Capita	-0.0001	0.0004
Initial GDP per Capita	-0.0007	0.0004
Inflation	0.01	0.08
Trade	0.23*	0.13
Schooling (1960)	-0.79***	0.13
Private Credit	0.33***	0.11

*** 1% significance level, ** 5% significance level, *10% significance level

TABLE 1.4

Instrumental Variable Estimation: Regime 1		
Dependent Variable: Income Growth of the Poor Threshold Estimate: -1.36 Threshold variable <= -1.36 Number of observations: 18		
Variable	***Estimate***	***Standard Error***
Initial Income of Poor	-0.07***	0.02
Growth of GDP per Capita	0.42	0.48
Initial GDP per Capita	0.01***	0.005
Inflation	-0.002	0.002
Trade	-0.0003	0.004
Schooling (1960)	-6.3E-05	0.0002
Private Credit	-0.001	0.001

*** 1% significance level, ** 5% significance level, *10% significance level

TABLE 1.5

Instrumental Variable Estimation: Regime 2		
Dependent Variable: Income Growth of the Poor Threshold Estimate: -1.36 Threshold variable > -1.36 Number of observations: 30		
Variable	***Estimate***	***Standard Error***
Initial Income of Poor	-0.04***	0.01
Growth of GDP per Capita	-0.94*	0.57
Initial GDP per Capita	0.01***	0.003
Inflation	-0.0001***	3.0E-05
Trade	0.001	0.002
Schooling (1960)	1.9E-05	2.0E-05
Private Credit	0.0001***	3.1E-05

*** 1% significance level, ** 5% significance level, *10% significance level

II. GROWTH OF THE GINI COEFFICIENT

To ensure that our threshold model for the growth of Gini coefficient will generate accurate results, we compare our non-threshold OLS regression to the estimate that [1] obtained for private credit. Beck, Demirguc-Kunt, and Levine, and our non-threshold results generate a negative value and suggest that financial development and the growth of the Gini coefficient display a negative relationship and both estimates for private credit are significant at the 1% significance level. Table 2.1 summarizes our results for the OLS regression including the significance level of each variable. Table 2.2 and 2.3 includes threshold estimation results for all variables below and above the threshold values respectively. Table 2.4 and 2.5 consists of results for instrumental variable estimation for the threshold model for values below and above the threshold values.

The results from our threshold model estimation reveal that any level of private credit above 0.02 is essential for the examined countries to lower income inequality within nations. Table 2.2 places 26 out of 44 countries below this threshold value where private credit has no significant effect on the growth of the Gini. Table 2.3 summarizes the results for threshold estimation values above 0.02. 18 out of 44 fell above this threshold value and displayed a negative relationship between private credit and the growth of the Gini coefficient to show that income inequality decreases as financial intermediaries supply loans to the private sector when the private credit value is above 0.02. We strengthen our findings from these threshold estimations by using an instrumental variable estimation to correct for endogeneity bias. The IV results for the growth of the Gini coefficient in Table 2.4 reveal that the IV estimate for private credit is -0.53. 28 out of 39 countries fell below this new threshold value while 11 countries were above the threshold estimate. This estimation also produces negative and significant values at the 1% significance level for private credit.

TABLE 2: GROWTH OF THE GINI COEFFICIENT

Growth of the Gini coefficient: growth rate of the Gini coefficient between 1960 and 1999
Initial Gini: logarithm of Gini coefficient in 1960
Growth of GDP per capita: growth rate of real GDP per capita between 1960 and 1999
Initial GDP per capita: logarithm of the real GDP per capita in 1960
Inflation: growth rate of the GDP deflator between 1960 and 1999
Trade openness: logarithm of the ratio of the sum of exports and imports to GDP averaged between 1960 and 1999
Schooling: logarithm of secondary school completion in 1960
Private credit: ratio of the value of credits transferred from financial intermediaries to private sectors between 1960 and 1999. [1]

TABLE 2.1

Global OLS Estimation: Without Threshold		
Dependent Variable: Growth of the Gini Observations: 44 Degrees of Freedom: 36 R-squared: 0.92		
Variable	***Estimate***	***Standard Error***
Constant	3.57***	0.88
Initial Gini	-0.08	0.16
Growth of GDP per Capita	-0.05	0.05
Initial GDP per Capita	-0.001	0.004
Inflation	-0.0006	0.002
Trade Openness	-0.32	0.24
Schooling	-0.52**	0.25
Private Credit	1.14***	0.28

*** 1% significance level, ** 5% significance level, *10% significance level

TABLE 2.2

Threshold Estimation: Regime 1		
Threshold Variable: Private Credit Threshold Estimate: 0.02 Private Credit <= 0.02 Dependent Variable: Growth of the Gini Observations: 26 Degrees of Freedom: 18 R-squared: 0.99		
Variable	***Estimate***	***Standard Error***
Constant	1.34	1.38
Initial Income of Poor	0.31*	0.17
Growth of GDP per Capita	0.02	0.02
Initial GDP per Capita	-0.26**	0.11
Inflation	-0.0006	0.0007
Trade	-0.11	0.11
Schooling (1960)	0.18*	0.10
Private Credit	0.22	0.16

*** 1% significance level, ** 5% significance level, *10% significance level

TABLE 2.3

Threshold Estimation: Regime 2		
Threshold Variable: Private Credit Threshold Estimate: 0.02 Private Credit > 0.02 Dependent Variable: Growth of the Gini Observations: 18 Degrees of Freedom: 10 R-squared: 0.97		
Variable	***Estimate***	***Standard Error***
Constant	15.69***	1.62
Initial Income of Poor	-0.50	0.81
Growth of GDP per Capita	-0.09	0.21
Initial GDP per Capita	0.004***	0.001
Inflation	0.72***	0.21
Trade	0.72***	0.19
Schooling (1960)	-9.18***	1.75
Private Credit	-2.06***	0.43

*** 1% significance level, ** 5% significance level, *10% significance level

TABLE 2.4

Instrumental Variable Estimation: Regime 1		
Dependent Variable: Growth of the Gini Threshold Estimate: -0.53 Threshold variable <= -0.53 Number of observations: 28		
Variable	***Estimate***	***Standard Error***
Growth of GDP per Capita	0.12	0.30
Initial Gini	-0.007*	0.004
Inflation	1.19E-05	1.31E-05
Trade	0.003	0.003
Schooling (1960)	0.0005	0.004
Private Credit	-0.007*	0.004

*** 1% significance level, ** 5% significance level, *10% significance level

TABLE 2.5

Instrumental Variable Estimation: Regime 2		
Dependent Variable: Growth of the Gini Threshold Estimate: -0.53 Threshold variable > -0.53 Number of observations: 11		
Variable	***Estimate***	***Standard Error***
Growth of GDP per Capita	0.06	0.11
Initial Gini	0.004	0.003
Inflation	0.0005***	0.0002
Trade	-0.01***	0.002
Schooling (1960)	0.008***	0.002
Private Credit	-0.03***	0.004

*** 1% significance level, ** 5% significance level, *10% significance level

III. GROWTH OF THE HEADCOUNT RATIO

The non-threshold, OLS regression model we obtained for the growth of the headcount ratio indicates a negative relationship between private credit and the growth of the headcount which is similar to that of [1]. Our results for the OLS regression are shown in Table 3.1. While the private credit estimate was significant for the OLS regression, Table 3.2 and 3.3 generate threshold results for private credit that are insignificant. Furthermore, 18 out of 44 observations show that private credit has an insignificant negative relationship with the growth of the headcount ratio for values below the threshold estimate. 26 observations had values for private credit that were above the threshold estimate but had insignificant relationships between the headcount growths. Table 3.4 and 3.5 present the IV estimation results with a threshold value similar to that of the threshold estimation. The IV estimation however, provides stronger evidence for the IV threshold value and implicates negative and significant relationship between financial development and the growth of the headcount ratio.

TABLE 3: GROWTH OF THE HEADCOUNT RATIO

Growth of the headcount: growth rate of the percent of population living on a $1day or less between 1980 and 2000
Initial headcount: logarithm of Headcount in 1980
Growth of GDP per capita: growth rate of real GDP per capita between 1980 and 2000
Age Dependency: Ratio of the population below the age of 15 and above the age of 65 to the population between the ages of 15 and 65 between 1980 and 2000
Population growth: annual growth rate of population between 1980 and 2000
Inflation: growth rate of the GDP deflator between 1980 and 2000
Trade Openness: logarithm of the ratio of the sum of exports and imports to GDP averaged between 1980 and 2000
Schooling: logarithm of secondary school completion in 1980
Private Credit: ratio of the value of credits transferred from financial intermediaries to private sector between 1980 and 2000. [1]

TABLE 3.1

Global OLS Estimation: Without Threshold		
Dependent Variable: Growth of the Headcount Ratio Observations: 44 Degrees of Freedom: 35 R-squared: 0.39		
Variable	***Estimate***	***Standard Error***
Constant	0.24	0.16
Initial Headcount	-0.02**	0.01
Growth of GDP per Capita	-1.0002	0.65
Age Dependency	0.09	0.13
Population Growth	-0.008	0.02
Inflation	4.07E-05	0.0001
Trade Openness	-0.05*	0.03
Schooling	-0.007	0.03
Private Credit	-0.04*	0.02

*** 1% significance level, ** 5% significance level, *10% significance level

TABLE 3.2

Threshold Estimation: Regime 1		
Threshold Variable: Private Credit Threshold Estimate: -1.55 Private Credit <= -1.55 Dependent Variable: Growth of the Headcount Ratio Observations: 18 Degrees of Freedom: 9 R-squared: 0.72		
Variable	***Estimate***	***Standard Error***
Constant	0.09	0.25
Initial Headcount	-0.06	0.02
Growth of GDP per Capita	-1.79	1.10
Age Dependency	0.32	0.20

Threshold Estimation: Regime 1		
Threshold Variable: Private Credit Threshold Estimate: -1.55 Private Credit <= -1.55 Dependent Variable: Growth of the Headcount Ratio Observations: 18 Degrees of Freedom: 9 R-squared: 0.72		
Variable	***Estimate***	***Standard Error***
Population Growth	-0.02	0.04
Inflation	10.0E-05	0.0002
Trade Openness	0.02	0.05
Schooling	-0.03	0.04
Private Credit	-0.05	0.04

*** 1% significance level, ** 5% significance level, *10% significance level

TABLE 3.3

Threshold Estimation: Regime 2		
Threshold Variable: Private Credit Threshold Estimate: -1.55 Private Credit > -1.55 Dependent Variable: Growth of the Headcount Ratio Observations: 26 Degrees of Freedom: 17 R-squared: 0.46		
Variable	***Estimate***	***Standard Error***
Constant	0.51	0.29*
Initial Headcount	-0.003	0.02
Growth of GDP per Capita	-0.37	1.07
Age Dependency	0.28	0.25
Population Growth	-0.04	0.04
Inflation	-0.0002	0.0002
Trade Openness	-0.14	0.05***
Schooling	0.13	0.08
Private Credit	0.02	0.05

*** 1% significance level, ** 5% significance level, *10% significance level

TABLE 3.4

Instrumental Variable Estimation: Regime 1		
Dependent Variable: Growth of the Headcount Ratio Threshold Estimate: -1.55 Threshold variable <= -1.55 Number of observations: 19		
Variable	***Estimate***	***Standard Error***
Growth of GDP per Capita	-3.82**	1.55
Initial Headcount Ratio	-0.16*	0.08
Inflation	1.01	0.71
Age dependency	0.05	0.09
Population growth	-0.0003	0.0003
Trade	0.10**	0.05
Schooling (1960)	0.04	0.08
Private Credit	-0.03	0.07

*** 1% significance level, ** 5% significance level, *10% significance level

TABLE 3.5

Instrumental Variable Estimation: Regime 2		
Dependent Variable: Growth of the Headcount Ratio Threshold Estimate: -1.55 Threshold variable > -1.55 Number of observations: 24		
Variable	***Estimate***	***Standard Error***
Growth of GDP per Capita	2.29*	1.26
Initial Headcount Ratio	-0.06	0.05
Inflation	0.28	0.25
Age dependency	0.07**	0.03
Population growth	0.0005**	0.0002
Trade	-0.08***	0.03
Schooling (1960)	0.10	0.06
Private Credit	-0.13**	0.06

*** 1% significance level, ** 5% significance level, *10% significance level

*TABLE 4: PRIVATE CREDIT OF EXAMINED COUNTRIES

Countries	**Private Credit Values**
Australia	0.54
Burundi	0.10
Burkina Faso	0.13
Bangladesh	0.20
Bulgaria	0.09
Bahamas, The	0.47
Bolivia	0.29
Brazil	0.27
Botswana	0.12
Canada	0.74
Chile	0.54
Cote d'Ivoire	0.31
Cameroon	0.19
Colombia	0.28
Costa Rica	0.16
Germany	0.97
Denmark	0.41
Dominican Republic	0.26
Algeria	0.31
Ecuador	0.23
Egypt, Arab Rep.	0.33
Spain	0.78
Ethiopia	0.16
Finland	0.63
France	0.89
United Kingdom	0.86
Ghana	0.03
Gambia	0.16
Greece	0.40
Guatemala	0.16
Guyana	0.34
Hong Kong, China	1.48
Honduras	0.30
Croatia	0.32
Hungary	0.29
Indonesia	0.30
India	0.25
Jamaica	0.27
Japan	1.48
Kenya	0.31
Korea, Rep.	0.86
Lao PDR	0.06
Sri Lanka	0.19
Lesotho	0.15
Morocco	0.31
Madagascar	0.15
Mexico	0.17

*Table 4 is a modified version of Table 1: Financial Development and Growth of Inequality and Social Indicators from [1].

Countries	Private Credit Values
Mali	0.13
Mongolia	0.09
Mauritania	0.32
Malaysia	0.89
Niger	0.12
Nigeria	0.14
Nicaragua	0.28
Netherlands	1.22
Norway	0.81
Pakistan	0.24
Panama	0.56
Peru	0.14
Philippines	0.33
Poland	0.16
Portugal	0.72
Paraguay	0.18
Romania	0.08
Senegal	0.28
Singapore	0.97
Sierra Leone	0.04
El Salvador	0.06
Slovenia	0.26
Sweden	1.08
Thailand	0.71
Trinidad and Tobago	0.44
Tunisia	0.59
Turkey	0.16
Uganda	0.03
Uruguay	0.32
United States	0.94
Venezuela	0.32
Vietnam	0.15
South Africa	0.52
Zambia	0.06

The objectives of our findings are to determine the level of threshold for private credit to positively influence the income growth of the poor and reduce income inequality. Since there are only a small number of countries that are above the threshold level indicated by our results, it highlights important policy implications that are needed to improve the financial sectors of countries that fall below the threshold level. We used instrumental variable estimation to ensure that financial development is a robust indicator of poverty reduction and income inequality, and that the results are not driven by endogeneity bias. This further indicates that financial development can provide a powerful channel through which poverty and income inequality can be reduced.

CONCLUSION

Our threshold results depict the minimum level of private credit that must be achieved by the cross-examined countries to bring financial prosperity to the poorest sectors of each country. The values for private credit estimates in which private credit falls above the threshold value can be used to compare income growth, the growth of the Gini coefficient, and growth of the headcount ratio between the cross-examined countries. Comparisons between countries can be made to determine the growth rate of developing countries given the same level of financial development as that of a developed country. The private credit estimates for instrumental variable estimation will generate results that account for endogeneity bias and will emphasize the effects of financial development without reverse causation. The values obtained from both the threshold and IV estimation results gives rise to potential policy implementations that can effectively target the level of private credit suggested by our results to promote income growth of the poor, reduce inequality and alleviate poverty in developing countries. Furthermore, empirical evidence for financial development has proven to be beneficial to the welfare of society and can be implemented through further policy-related research.

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