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FINANCIAL DEVELOPMENT, INSTITUTIONS AND POVERTY ALLEVIATION: AN EMPIRICAL ANALYSIS

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Financial development, institutions and poverty alleviation: an empirical analysis
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ABSTRACT

The aim of this paper is to empirically analysewhether the level of institutional quality influences the effect of financial development on poverty for a sample of developing countries covering the period from 1984 to 2012, or not. Using an interaction term constructed as a product between financial development and institutional qualitywe find that the pro-poor impact of financial development decreases as the quality of institution rises. Such differential effect can be ascribed to the capacity of banks to provide functions that mimic those performed by a well-working institutional framework.The results of this paper can be used for policy management.

JEL Classification: G20,I32, O17

Keywords: Financial Development, Institutional Quality, Poverty Alleviation, Developing Countries

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1. Introduction

In this paper we aim at analysing if financial development and quality of institutions together have a positive effect on poverty alleviation for a group of developing countries for the period 1984 to 2012. Poverty and ways to palliate it has attracted the attention of researcher for log time. In recent years an increasing body of the literature has focused on pinpointing the factors underlying poverty alleviation. A number of empirical papers have investigated the impact of financial development on the incidence of poverty (Honohan, 2004; Beck *et al*., 2007; Akter*et al*., 2010; Perez-Moreno, 2011; Jeanneney and Kpodar, 2011).[1]Other authors have analysed the linkage between financial development and poverty within single countries (e.g. Quartey, 2005; Odhiambo, 2009; Inoue and Hamori, 2012; Ho and Odhiambo, 2011; Uddin*et al*., 2014).Another strand of literature has examined whether a well-working institutional framework affects the standard of living for the poor(Chong and Calderón, 2000;Hasan *et al*. 2007; Tebaldi and Mohan, 2010; Perera and Lee, 2013).

After the 2008-onwards crises, an increasing literature has focused on the role of financial institutions on the causes and consequences of the crises on developed economies. However, very little work has recently been done on the interaction between financial development and institutional framework. Our paper draws from both segments of such literature in order to assess whether the institutional framework playsany role in mediating the influence of financial development on poverty. In principle, one would expect that financial development would go in hands with a more efficient allocation of resources, access to funds by all income groups, and devoting resources to productive investment. In a related fashion, Mishkin (2009) claims that financial globalisation can be very beneficial for the poor. According to the latter author, financial globalisation would encourage a well working financial system and hence financial development. In addition,the underlying idea is that the financial and the institutional systems interact in affecting poverty rate. Specifically, the financial sector and institutions can work as complements or substitutes. Iffinancial systems and institutions complement each other,then the pro-poor effect of financial development is amplified by the working of a sound institutional framework. Conversely, if finance and institutions work as substitutes,then the effect of financial development on poverty alleviation is reduced as the level of institutions increases. Similar to our line of reasoning, Compton and Giedeman (2011)have focused on the interaction between finance and institutionsin relation to the

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[1] All these studies are based on large sample of countries.

process of economic growth. The authors find that the growth effect of financial development weakens as institutional quality rises. They seetheir finding as evidence in favour of a substitution effect between financial development and institutions.

The aim of this paper is to investigate whether financial development and institutional development interact in their effects on poverty. Specifically, with data for up to 58 countries spanning 1984 to 2012 we usethree financial measures along with an institutional variable toassess whether the effect of financial development on poverty varies across different levels of institutional quality. We assess this differential effect using both cross-section and panel analysis.Our results corroborate there exists a substitutability effect between financial and institutional development. However, our results are somehow contrary to the ones found by Gries et al. (2009), where the authors obtain that there is only limited support in favour if the finance-led growth. Wecontribute to the existing empirical studies on poverty by allowing for a flexible functional form based on an interaction term between financial development and institutions.

Assessing whether the impact of financial development on poverty is influenced by institutions has important policy insights; not accidentally, two of the Word Bank's top priorities include the development of the financial sector and the institution-building.[23] Thus, knowing whether and how financial development and institutional quality interact in their effect on poverty is crucial in deciding the most desirable allocation of available resources between these two priorities. If the working of the financial sector complements that of the institutions in terms of poverty alleviation, then the highest pay-out in terms of poverty alleviation from an improve in the financial system will be obtained in the countries with the best institutional set-up; thus, the policy maker will resolve to invest on both finance and institutions. On the other hand, if finance and institutions are substitutes, then financial development in the countries with the worst institutional framework will pay the highest pay-out; consequently, policy maker will find more sensible to invest on only one of the two dimensions.

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[2] See footnote 2 of Compton and Giedeman (2011) and the references cited therein.
[3] The terms institutional development and institution-building are used interchangeably in this study. Also, "finance" is sometime used to denote financial development.

We find that financial development has a clear positive impact on poverty alleviation, and this finding is robust to different definitions of financial state and poverty. Likewise, our estimations highlight that the degree of financial development has also an important and clear effect on poverty alleviation. Interestingly, our results also show that the pro-poor impact of financial development is less clear where institutions work better (and vice-versa). This paper has then clear policy implications since a few lessons for policy making could be potentially be learnt from the analysis.

The rest of the paper is organised as follows. Section 2 deals with the empirical model and the methodology. Section 3 describes the data. Section 4summarisesthe empirical findings of the analysis. Finally, section 5providessome concluding remarks.

2.   The Empirical Model and the Estimation Method

The main aim of this study is to examine whether the level of institutional quality affects the impact of financial development on poverty. We start our analysis from a cross-section model specified as follows:

$$Pov_i = \alpha + \beta_0 Pov_i^0 + \beta_1 FD_i + \beta_2 INS_i + \beta_3 FD_i * INS_i + \Gamma X_i + \varepsilon_i \qquad [1]$$

where subscript $i$represents country.$Pov_i$is a measure of poverty incidence. As poverty rates are expected to display some degree of inertia, its initial level (Pov_i^0) has also been included in the set of regressors.$FD_i$is financial development and INS_i is the institutional quality indicator, both measured in 1984in order to minimise concerns about reverse causation.The idea is that to the extent that the development of financial sector is driven by the demand of financial services, poverty can prevent the financial sector from developing. Similarly, poverty might give raise to conditions that avert the development of the institutional set-up. The variable$FD_i * INS_i$represents the interaction term between financial development and institutional quality. Following Dollar and Kraay (2002) and Arestis and Caner (2010) we include a vector of three additional explanatory variables,X_{it},namely *schooling*, the logarithm of*public spending* and the Gini index of *income inequality*, all calculated as their 1984-2012 average. $\varepsilon_i$denotes the error term.

The schooling variable is included to control for the initial level of human capital. Its sign is expected to be negative as a higher level of education should be associated with lover poverty rates. Public spending is a proxy of the overall size of government. It has been included to control for public policies which transfer income from the wealthy to the poor, such as state subsidy and public expenditure for education. The impact of public consumption expenditure is a priori ambiguous because it depends largely on the extent to which public resources are employed for uses which primarily benefit the poor.Finally, the Gini variable is included as the beneficial impact of financial development on the poor is thought to depend on the level of inequality. Specifically, if inequality is low, a higher share of benefits from financial development is expected to accrue to the poorest.

The coefficients α, β_0,β_1, β_2, β_3 and Γ denote the parameters to be estimated. A statistically significant negative sign of β_1 provides evidence in favour of a pro-poor direct impact of financial development. Similarly, a negative sign of β_2 implies that higher levels of institutional quality per se are conducive to lower poverty rates.As for the interaction term, a negative sign of β_3 suggests that the working of a sound institutional framework strengthens the pro-poor impact of financial development - i.e. finance and institutions are complements. Conversely, a positive sign of β_3 means that the pro-poor effect of financial development is smaller in countries where institutions are already well developedthan in countries with weak institutions – i.e. finance and institutions are substitutes.On the other hand, lack of statistical significance of β_3 implies that the impact of financial development on poverty is independent from the level of institutional development. For illustrative purposes, the coefficients of the main variables of interest along with their signs and meaning are displayed in table 1.It is important to note that if the interaction between financial development and institutions is statistically significant, then any model of poverty that excludes the interaction may be misspecified and suffering from omitted variables bias.

The cross section results obtained by running model [1], though informative, havesome important shortcomings.Specifically, the inclusion of the lagged dependent variable in the right hand side of equation [1] causes the fixed effects (which is part of the error term $\varepsilon_i$in the cross-country regression) to be correlated with the set of regressors. Such correlation biases the cross section estimates. Furthermore, cross-sectional analyses are unable to exploit any

piece of information available in the time-series dimension of the data. In order to overcome these difficulties, we also use a panel approach.The model takes the following form:

$$Pov_{it} = \alpha + \beta_0 Pov_{it-1} + \beta_1 FD_{it-1} + \beta_2 INS_{it-1} + \beta_3 FD_{it-1} * INS_{it-1} + \Gamma X_{it} +$$
$$+ \lambda_t + \eta_i + \varepsilon_{it} \qquad [2]$$

where t represents time period, λ_t is a time fixed effect, η_i is the country-specific effect and ε_{it} is the disturbance. This panel model coupled with the system GMM estimator (explained in the following section) allows us to deal with the fixed effect and to assess whether changes in financial development (institutional quality) over time within a country have any effect on poverty.

Before concluding this section we would like to pinpoint that, due to the presence of the interaction term,the overall impact of financial development on poverty has to be assessed by computing the marginal effect of financial development as showed in the equation below:

$$\frac{\partial Pov_{it}}{\partial FD_{it}} = \widehat{\beta_1} + \widehat{\beta_3} \times INS^* [3]$$

where $\widehat{\beta_1}$ and $\widehat{\beta_3}$ are the estimated coefficients of financial development and the interaction term, respectively. INS^* is the particular level of institutional development. Using equation [3] we calculate the elasticity at the, 10th, 25th, 50th, 75th and 90th, percentile of the underlying institution variable.

2.1. The Estimator

To run the cross-country regression [1] we use simple OLS estimator. As for the panel analysis [2], we use a system GMM panel estimator to deal with the potential endogeneity issues of the variables (Arellano andBover, 1995; Blundell and Bond, 1998). This technique runs a system of two equations,one in levels and the other in first-differences. The estimator uses the lagged values ofthe explanatory variables, in levels as well as in first-differences, as IV instruments forthe respective equations ("internal" instruments).The system GMM estimator controls effectively for unobserved country-specific effects and mitigates the problem of measurement error. Further, contrary to within estimators, system GMM leads to

consistent parameter estimates in presence of the lagged dependent variable on the right hand side of the equation.

In order to be a valid IV variable, the set of instruments has to satisfy the population moment conditions used by the estimation process. The validity of this assumption can be assessed empirically by checking the Hansen test of over-identifying restrictions.Failure to reject the null hypothesis supports the overall validity of the instruments. An additional assumption has to be satisfied to generate consistent GMM estimates.Specifically, it is required that the error term ε_{it} exhibits no serial correlation higher than order one. Such assumption can be tested with the Arellano and Bond test. If the null hypothesis is not rejected, then second-order serial correlation can be discarded.

3. The Data and Variable Definitions

Our investigation focuses on set of 58 countries over the period 1984-2012. The size of the sample is limited mainly by the availability of data for the povertyand institution variables.In keeping with the literature, the panel data are averaged over five-year periods(the last period is composed by four years). This allows us to abstract from short run disturbances.The panel dataset is unbalanced and it includes observations with a maximum of six non-overlapping periods.

The complete list of countries is displayed in Appendix, Table A.1. Most of the data are collected from the World Development Indicators. Table A.2 in Appendix provides a description of the main variables with data sources.

In line with the standard development literature, we use the headcount index based on $ 2 as a measure of poverty. This index counts the number of people with per capita consumption (or income) below the poverty line. Data on poverty rates for developed countries are not available, thus the sample includes developed countries only.

The institution variable is from the International Country Risk Guide. Specifically, we use an aggregate measure of institutions based on the rule of law, corruption in government, and quality of bureaucracy. This variable has been used by Law *et al*. (2013) and Compton and Giedeman (2011) to analyse the role played by institutions in the finance-growth nexus. The

variable has been rescaled from 0 to1, where higher values implies better institutional quality and vice versa.

Withrespect to financial development, since the bulk of financial services in developing countries are provided by banks, we rely on the most used bank-based measures of financial development, namely private credit, liquid liabilities and deposit money bank assets, all expressed as a share of GDP.Private credit gauges the amount of credit that banks (except monetary authorities) allocate to the private sector. This is a standard variable in the finance literature and it has been used, among others, by Honoan (2004) and Beck *et al*. (2007) to analyse the impact of financial development on poverty rate. Liquid liabilities (M3)is a measure of broad stock money and it has been used among others by King and Levine (1993) and Masih and Khan (2011). Deposit money bank assets (bank assets) equal the claims on the nonfinancial real sector by banks. Contrary to private credit, this proxy accounts for credit to government and state-owned enterprises. This measure has been used as a proxy measure of financial development by, among others, Clarke *et al*. (2006) and Kim and Lin (2011).

4. Estimation Results
4.1. Overview of the data

Table 2 illustrates descriptive statistics for the largest sample available. As it can be seen, rates of poverty vary considerably across countries. For example, the headcount index at $2 a day ranges from virtually zero (no poor) for Hungary to 0.98 (almost all poor) for Tanzania. Financial development and institutional quality also show considerable variation across the sample. Hungary is the country with the highest institutional quality. The countries having the highest score in terms of financial development are Malaysia, China and Thailand.

Table 3 displays the correlations between the index of poverty and the independent variables. The proxies of financial development as well as the institutional variable are all significantly correlated with the headcount ratio, though the sizes of the correlations arenot high.Private credit is highly correlated with both liquid liabilities and bank assets. Surprisingly, the correlation between education and poverty is not statistically significant. Though informative, these simple correlations provide little insight in terms of casual effect. In order to investigate causality we have to turn on the regression function[1] and [2].

4.2. Estimation Results

As explained in section 2, we start our empirical investigation by running the cross-section function as described by model [1].The results are illustrated in Table4. As for the set of controls, in line with our expectations, the estimates show that education has a statistically significant impact on poverty alleviation, as it would be expected. The sign of public spending is positive, meaning that government intervention in our sample has adversely affected the poor. However the coefficient is not statistically significant. This may be due to the fact that spending has not been helpful to develop areas which would aid in poverty reduction. Contrary to the expectations Gini has a negative sign, yet it fails to achieve any conventional level of significance.

Moving our focus to the main variables of interest, we notice that the coefficients associated with financial development are statistically significant, regardless of the specific financial measureadopted. This result provides evidence in favour of a pro-poor impact of financial development,which is the expectation andin line with the findings of previous studies on the financial development-poverty nexus. Similarly, the coefficient of the institutional variable is negative and statistically significant, meaning thatthe impact of institutional development is also pro-poor. This finding is in line with Tebaldi and Mohan (2010) and Chong and Calderon (2000) who show that institutional quality has a statistically significant impact on poverty alleviation.

To assess the overall impact of finance on poverty we now turn to the interaction term between financial development and institutional quality. As it can be seen, the coefficient associated with the interaction term is positive and statistically significant, regardless of the proxy of financial development. This result revealsa substitution effect whereby the impact of financial development on poverty alleviation weakens as the level of institutional quality rises. By the same token, the pro-poor impact of institutional building is weaker when the financial sector is highly developed. As it will be explained below, one possible interpretation of this finding is that some of the functions associated with well-working institutions are performed also by the financial sector.

We now turn our attention to the panel regression function illustrated in model [2]. As it can be seen from Table 5, the panel estimates generally mirror the cross section results.

Interestingly, unlike the cross-section, public spending turns out to be statistically significant. As for the consistency of the estimator, statistical tests show that the assumptionsunderlying Arellano and Bover's estimators are met. Specifically, the test for second-order serial correlation cannot reject the null hypothesis that the errorterm is not serially correlated at order 2 and higher orders. Furthermore, the Sargan testof overidentifying restriction does not invalidate the set of instruments used in theestimation.

To get more concrete findings we compute the elasticities of poverty with respect to financial development. Because of the presence of the interaction between financial development and institutional quality, the estimates of elasticity have to be computed on the basis of Equation 3. Table 6 illustrates the point estimates of the elasticities along with their standard errors and p-values.For visual analysis, the estimates are also plotted in Figures 1 to 3. As it can be seen, the elasticity is negative and significantly different from zero over most ofthe range of the institutional variable. The table clearly illustrates that the impact of financial development on poverty varies across different percentiles of institutions. Specifically, the estimates show that the pro-poor impact of financial development weakens as the institutional framework improves.

The economic relevance of the differential effect across different levels of institutional development is somewhat large. To give a numerical example, a country which is at the 10th percentile of our institutional measure (for example, Armenia) will see its poverty rate to decrease by 0.26% as its private credit increases by 1%. On the other hand, a same increase of private credit ina country which is at the 90th percentile(e.g. Costa Rica) will have no tangible effect on poverty.

To sum up, our findings suggest that both financial and institutional development appears to effectively relieve poverty. However, the findings also point that the less progress has been achieved in the institutional set-up, the higher is the marginal benefit from improving the financial sector and vice-versa. One possible reason underlying such differential effect is that a well-working banking sector could provide functions that mimic those performed by institutions. In an institutional setting characterised by a weak legal enforcement and an ill-defined property rights, the severity of the transaction and information costs make difficult for the individual (especially the poor) to contract and raise funds from the market. Here banking relationships, due to their quality of being personal and self-enforcing, can lower these costs, thus patching up the deficiencies in the institutional framework. In this sense,

banks can surrogate the functions provided by formal institutions. Thus, the highest rewards from the promotion of a well-working banking sector might arise precisely where the need for reducing transaction cost is more pressing, namely where institutions are weak. Alternatively, the benefit from quality improvements ininstitutions might be greater in financially underdeveloped economies than in countries with high levels of banking development. Kim and Lin (2011) provide with a thorough analysis on the existence of thresholds when looking at the relationship between financial development and poverty. Basically, financial development helps disproportionally the poor, only once a certain degree of financial development has been reached. This may explain the need to reinforce first the good quality of institutions, which in a way can provide a more stable framework for financial institutions and can lead to a positive impact of resources devoted to the development of the financial system.

It is important to note that by no means we are proposing that the banking sector and institutions are perfect substitutes. Rather we are suggesting that some of the positive effects that well-working institutions have on the transaction and information costs might also stem from a developed banking sector.

4.3. Robustness Check and Extensions

In this section we perform some further regression analysis in order to test the robustness of the empirical results. First, we proceed to select a more "conservative" poverty line established at the threshold of $ 1.25. We also use an alternative index of poverty, namely poverty gap. This index gauges the "breadth" and intensity of poverty, whereby the higher the index, the farther is the average poor from the poverty line. The empirical estimates are showed in Table 7. For the sake of space we have reported only the results concerning the regression with private credit as the financial measure. Similar results apply to M3 and bank assets (results available upon request). As it can be seen, financial development and institutions still exhibit substitutability in their effect on poverty alleviation, regardless of the index and the threshold line used to define poverty.

Next, we have included one-by-one additional control variables that represent potentially important factors underlying poverty, namely economic growth, fertility rate, trade openness, inflation, age dependency ratio and an index gauging the degree of civil liberties. The results

are displayed in Table 8.As one would expect, the estimates show a positive and significant impact of per capita GDP growth on poverty alleviation (column 1). Such finding provides evidence in favour of a pro-poor impact of growth, meaning that poverty alleviation and growth are likely to go hand in hand. Not surprisingly, this result is in line with several empirical studies, such as Dollar and Kraay (2002), Jalilian and Kirkpatrick (2005) and Kraay (2006). As it can be seen, the inclusion of the growth variable does not affect the sign and statistically significance of financial development and institutions. This means that the improvements in the financial sector and institutions alleviate poverty via channels other than the one working through growth.

As for civil liberties, the variable is constructed in a way such thata higher level of the index corresponds to a lower degree of freedom. The positive sign means that a raise in the degree of civil liberties leads to lower poverty rates, as one would expect (column 6). With regard to financial development, institutions and their interaction, the sign and statically significance of the associated coefficients are preserved across all the specifications. The main variables of interest maintain sign and statically significance when we run a regression accounting for all the explanatory variables (column 7).

We have also included the squared term of private credit as an additional regressor (column 8).In line with Greenwood and Javonavic's (1990) hypothesis, the idea is that in the early stages of development, improvement of the financial sector might be regressive in terms of income inequality. Hence, the pro-poor impact of financial development could manifest only in later stages. The estimates are showed in the last column of Table 7. We note that the square term is statistically significant but the size is zero. Thus, we can safely omit it when assessing the financial development-poverty nexus.

Another concern with estimations is the potential influence of outliers. We have used the Hadimvo procedure of outlier detection available in Stata for multivariate data (Hadi, 1994). The procedure yields no outliers.

5. Concluding Remarks

There has been an important amount of work done in the economic literature on poverty, on the effect of financial development and institutional framework on poverty. These previous

empirical studies have generally provided evidence of a pro-poor impact of financial development as well as institutions. Notwithstanding these results, the interaction effect between finance and institutions has been left out. The aim of this study is, hence, to reassess the causal link from financial development to poverty for a sample of developing countries while allowing an interaction effect between the financial sector and the institutional framework, which we believedmay be causing some omitted variable bias.

We have applied OLS regressions for panels and GMM regressions to take into account the possibility of endogeneity, along with different specifications and robustness checks to strengthen the validity of our results. The main results from this empirical investigation can be summarized as follows.First, we find that financial development has a statistically significant and positive impact on poverty alleviation. This result holds across all alternative measures of financial development and poverty. Secondly and similarly, the estimates show that the development of the institutional framework has also a significant and positive effect on poverty alleviation. However, we also find that the pro-poor impact of financial development is weaker where institutions work better (and vice-versa).

These findings provideevidence in favour of a substitution effect between finance and institutions. So, one possible reason behind such effect is that some of the limitations associated with a weak institutional framework might be alleviated by the working of the banking system. Also,the statistical significance of the substitution effect means that previous empirical models of poverty which fail to account for an interaction between financial development and institutions may be essentially misspecified. In terms of policy implications our findings point out thatthe highest returns in terms of poverty alleviation are obtained from allocating the resources to either the institution-building or the banking sector.This is particularly relevant in countries where economic resources and funds are scarce and funds devoted to satisfy basic needs of population. A proper rationing of these funds between financial development and improving the quality of institutions is then core to aid poverty alleviation and enhance economic growth. Of course, the decision of whether devoting funds to one or the other depend on the current levels of financial development and quality of institutions, finding which is corroborated by other authors which take into account threshold effects.

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Table 1: Sign and meaning of the coefficients associated with the main variables of interest

Sign	Meaning
$\beta_1 > 0$	Financial development is pro-poor
$\beta_2 > 0$	Institutional development is pro-poor
$\beta_3 > 0$	Financial sector and institutions are complements
$\beta_3 < 0$	Financial sector and institutions are substitutes
$\beta_3 = 0$	Neither complement nor substitutes

Table 2: Summary statistics for the main variables (1970-2005).

Variables	Mean	Std.Dev.	Min	Max
Headcount ($2 at day)	0.371	0.286	0.003	0.915
Private Credit	26.484	18.032	1.6	82.8
M3	31.624	20.286	0.25	96.15
Bank Assets	29.859	21.181	0.13	103.96
Institution	0.404	0.191	0.056	0.833
Education	2.527	0.298	1.567	3.139
Public Spending	6.368	2.377	1.197	10.63
Gini index	0.425	0.089	0.269	0.608

Notes: The table illustrates summary statistics of the main variables used for empirical analysis. Poverty ratio is the dependent variables.

Table 3: Correlation Matrix

	Headcount ($2 at day)	Private Credit	M3	Bank Assets	Institutions	Education	Public Spending
Private Credit	-0.380						
	(0.003)						
M3	-0.314	0.587					
	(0.016)	(0.000)					
Bank Assets	-0.322	0.806	0.807				
	(0.014)	(0.000)	(0.000)				
Institutions	-0.317	0.360	0.236	0.398			
	(0.015)	(0.005)	(0.074)	(0.002)			
Education	-0.211	0.227	0.285	0.253	0.348		
	(0.113)	(0.086)	(0.030)	(0.056)	(0.007)		
Public Spending	-0.721	0.267	0.149	0.153	0.179	0.233	
	(0.000)	(0.043)	(0.266)	(0.251)	(0.180)	(0.079)	
Gini index	-0.058	0.045	-0.119	0.010	-0.053	0.023	-0.141
	(0.664)	(0.739)	(0.373)	(0.943)	(0.692)	(0.867)	(0.293)

Notes: The table shows simple correlations between the main variables used for empirical analysis. P-values are in parentheses.

Table 4: Cross-section estimates

	Private Credit [1]	M3 [2]	Bank Assets [3]
Pov0	0.731***	0.718***	0.730***
	(0.049)	(0.052)	(0.048)
Education	-0.015**	-0.019***	-0.017**
	(0.007)	(0.007)	(0.006)
Public Spending	0.061	0.080	0.073
	(0.044)	(0.048)	(0.046)
Gini	-0.041	-0.100	-0.046
	(0.136)	(0.142)	(0.135)
Institutions	-0.222**	-0.226**	-0.195**
	(0.085)	(0.091)	(0.076)
Interaction	0.005**	0.004**	0.004**
	(0.002)	(0.002)	(0.002)
Fin. Dev.	-0.003**	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)
Observations	58	59	60
Adj R squared	0.920	0.923	0.924

Notes: The table reports the estimates from the OLS estimator. The dependent variable is the $2 a day headcount index over the period 1984 to 2012. Interaction corresponds with the interaction term between the financial development and the institution variable. Robust standard errors in parenthesis. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Table 5: Panel estimates

	Private Credit [1]	M3 [2]	Bank Assets [3]
Poverty$_{t-1}$	0.683***	0.653***	0.694***
	(0.112)	(0.085)	(0.084)
Education$_t$	-0.031**	-0.028**	-0.028***
	(0.013)	(0.013)	(0.009)
Public Spending$_t$	0.111***	0.114***	0.117***
	(0.038)	(0.034)	(0.036)
Gini$_t$	0.035	0.010	0.037
	(0.232)	(0.182)	(0.166)
Institutions$_{t-1}$	-0.475**	-0.428**	-0.373***
	(0.190)	(0.171)	(0.100)
Interaction$_{t-1}$	0.011**	0.007*	0.007***
	(0.004)	(0.004)	(0.002)
Fin. Dev$_{t-1}$	-0.006***	-0.004**	-0.004***
	(0.002)	(0.002)	(0.001)
Observations	191	180	180
Countries	58	56	56
Instruments	25	25	25
AR(2) test	0.128	0.572	0.534
Hansen J test	0.721	0.822	0.852

Notes: The table reports the estimates from the two-step system GMM estimator. The dependent variable is the $2 a day headcount index over five-year intervals spanning 1984 to 2012. Interaction corresponds with the interaction term between the financial development and the institution variable. A constant term and a set of time dummy variables are included in all regressions but not reported. The last two rows report the p-values of the Arellano and Bond test and Hansen test, respectively. Robust standard errors in parenthesis. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Table 6: Elasticity of poverty with respect to financial development

	P10	P25	P50	P75	P90
Panel A – Private Credit					
Institutions	0.330	0.406	0.472	0.546	0.610
Elasticity	-0.261	-0.169	-0.090	-0.002	0.075
Std. Err	0.083	0.050	0.032	0.043	0.068
p-value	0.009	0.006	0.018	0.968	0.299
Panel B – M3					
Institutions	0.333	0.408	0.472	0.541	0.611
Elasticity	-0.224	-0.161	-0.107	-0.049	0.01
Std. Err	0.077	0.049	0.031	0.035	0.057
p-value	0.014	0.007	0.006	0.190	0.867
Panel C – Bank Assets					
Institutions	0.333	0.408	0.472	0.536	0.611
Elasticity	-0.219	-0.155	-0.100	-0.045	0.019
Std. Err	0.052	0.038	0.029	0.028	0.036
p-value	0.001	0.002	0.006	0.131	0.599

Notes: The table reports the percentiles of the institution variable, estimates of the elasticities of poverty with respect to financial development at particular levels of institutional quality, standard errors and p-values.

Table 7: Robustness analysis - Alternative indices of poverty

	Headcount ($1.25) [1]	Poverty gap ($2) [2]	Poverty gap ($1.25) [3]
y_{t-1}	0.662***	0.711***	0.560***
	(0.117)	(0.110)	(0.107)
Education$_t$	0.002	-0.005	-0.005
	(0.015)	(0.009)	(0.004)
Public Spending$_t$	0.148***	0.008	0.012
	(0.046)	(0.025)	(0.014)
Gini$_t$	0.061	0.106	0.062
	(0.309)	(0.139)	(0.068)
Institutions$_{t-1}$	-0.422**	-0.130*	-0.084*
	(0.160)	(0.075)	(0.049)
Interaction$_{t-1}$	0.010**	0.003**	0.002**
	(0.004)	(0.001)	(0.001)
Private Credit$_{t-1}$	-0.006**	-0.002**	-0.001**
	(0.003)	(0.001)	(0.001)
Observations	191	191	191
Countries	58	58	58
Instruments	25	32	32
AR(2) test	0.230	0.195	0.485
Hansen J test	0.239	0.831	0.958

Notes: The table reports the estimates from the two-step system GMM estimator. The *d*ependent variables are the $1.25 a day headcount index, the $ 2 a day poverty gap and the $1.25 a day poverty gap over five-year intervals spanning 1984 to 2012. Interaction corresponds with the interaction term between the finance and the institution variable. A constant term and a set of time dummy variables are included in all regressions but not reported. The last two rows report the p-values of the Arellano and Bond test and Hansen test, respectively. Robust standard errors in parenthesis. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Table 8: Robustness Analysis - Additional Explanatory Variables

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Poverty$_{t-1}$	0.722***	0.688***	0.715***	0.689***	0.698***	0.694***	0.779***	0.661***
	(0.128)	(0.108)	(0.158)	(0.166)	(0.108)	(0.167)	(0.128)	(0.112)
Education$_t$	-0.022	-0.024*	-0.028*	-0.031*	-0.024*	-0.022	-0.023	-0.035**
	(0.014)	(0.012)	(0.015)	(0.016)	(0.013)	(0.014)	(0.019)	(0.013)
Public Spending$_t$	0.032	0.038	0.039	0.056	0.041	0.045	0.049	0.101***
	(0.029)	(0.027)	(0.034)	(0.036)	(0.026)	(0.037)	(0.041)	(0.036)
Gini$_t$	0.036	0.061	0.166	0.217	0.034	0.081	0.131	-0.021
	(0.247)	(0.214)	(0.246)	-0.241	(0.234)	(0.270)	(0.281)	(0.213)
Institutions$_{t-1}$	-0.422***	-0.411***	-0.420**	-0.431***	-0.407***	-0.434**	-0.439***	-0.509***
	(0.134)	(0.127)	(0.163)	-0.14	(0.148)	(0.203)	(0.118)	(0.159)
Private Credit$_{t-1}$	-0.005***	-0.005***	-0.006**	-0.005**	-0.005**	-0.006**	-0.005**	-0.004**
	(0.001)	(0.002)	(0.002)	-0.002	(0.002)	(0.002)	(0.002)	(0.002)
Interaction$_{t-1}$	0.009***	0.009***	0.011**	0.009**	0.009**	0.011**	0.009**	0.012***
	(0.003)	(0.003)	(0.004)	-0.004	(0.004)	(0.005)	(0.004)	(0.004)
Growth$_t$	-0.007**						-0.002	
	(0.003)						(0.004)	
Fertility$_t$		0.011					0.014	
		(0.010)					(0.017)	
Openness$_t$			0.032				0.001	
			(0.049)				(0.041)	
Inflation$_t$				0.027*			0.020	
				(0.014)			(0.015)	
AgeDependency$_t$					0.001		-0.001	
					(0.001)		(0.002)	
Civil Liberties$_t$						0.019*	-0.004	
						(0.011)	(0.007)	
Private Credit^2_t								0.000**
								(0.000)
Observations	190	191	191	181	191	191	181	191
Countries	58	58	58	56	58	58	56	58
Instruments	26	26	26	26	26	26	30	26
AR(2) test	0.497	0.092	0.058	0.445	0.089	0.091	0.443	0.342
Hansen J test	0.711	0.660	0.634	0.676	0.650	0.413	0.740	0.698

Notes: The table reports the estimates from the two-step system GMM estimator. Dependent variable is the $2 a day headcount index over five-year intervals spanning 1984 to 2012. Interaction corresponds with the interaction term between the financial development and the institution variable. A constant term and a set of time dummy variables are included in all regressions but not reported. The last two rows report the p-values of the Arellano and Bond test and Hansen test, respectively. Robust standard errors in parenthesis. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Appendix

Table A-1: List of Countries

Albania	Hungary	Philippines
Argentina	India	Romania
Armenia	Indonesia	Senegal
Bangladesh	Iran	Serbia
Bolivia	Jamaica	South Africa
Brazil	Jordan	Sri Lanka
Bulgaria	Kazakhstan	Tanzania
Cameroon	Kenya	Thailand
China	Malawi	Togo
Colombia	Malaysia	Tunisia
Costa Rica	Mali	Turkey
Cote d'Ivoire	Mexico	Uganda
Dominican Republic	Moldova	Ukraine
Ecuador	Morocco	Venezuela
Egypt	Mozambique	Vietnam
El Salvador	Nicaragua	Zambia
Gambia	Niger	
Ghana	Pakistan	
Guatemala	Panama	
Guyana	Paraguay	
Honduras	Peru	

Notes: The table illustrates the largest sample of countries used in the empirical investigation.

Table A-2: Description of Variables

Variable	Description	Source
Poverty headcount ($ 2)	Share of the population living on less than $ 2 per day at 2005 PPP	
Poverty headcount ($ 1.25)	Share of the population living on less than $1.25 per day at 2005 PPP	
Poverty gap ($ 2)	Mean shortfall from the poverty line of $ 2 per day measured as a share of the poverty	
Poverty gap ($ 1.25)	Mean shortfall from the poverty line of $ 1.25 per day measured as a share of the poverty line	
Private Credit	Domestic credit to private sector by banks (% of GDP)	World Development Indicators (World Bank)
Growth	Percentage change of per capita GDP per capita based on constant local currency	
Public spending	General government final consumption expenditure (% of GDP)	
Inflation	Percentage change in the consumer price index	
Gini	Ratio of the area between the Lorenz curve and the line representing perfect equality	
Age Dependency	Age dependency ratio (% of working-age population)	
Openness	Sum of exports and imports (% of GDP)	
Fertility	Fertility rate, total (births per woman)	
M3	Liquid liabilities (% of GDP)	Financial Structure Database 2010
Bank Assets	Deposit Money Bank Assets (% of GDP)	
Education	Average schooling years in the total population aged 15 and over	Barro and Lee (2010)
Civ. Lib.	Civil Liberties	Freedom House
Institutions	Arithmetic average of the ICRG variables "Corruption", "Law and Order" and "Bureaucracy Quality"	International Country Risk Guide

Notes: Data on institutions, education and civil liberties have been retrieved from Teorell, Jan, Marcus Samanni, Sören Holmberg and Bo Rothstein (2011). The Quality of Government Dataset, version 6Apr11. University of Gothenburg: The Quality of Government Institute [access via: http://www.qog.pol.gu.se.]

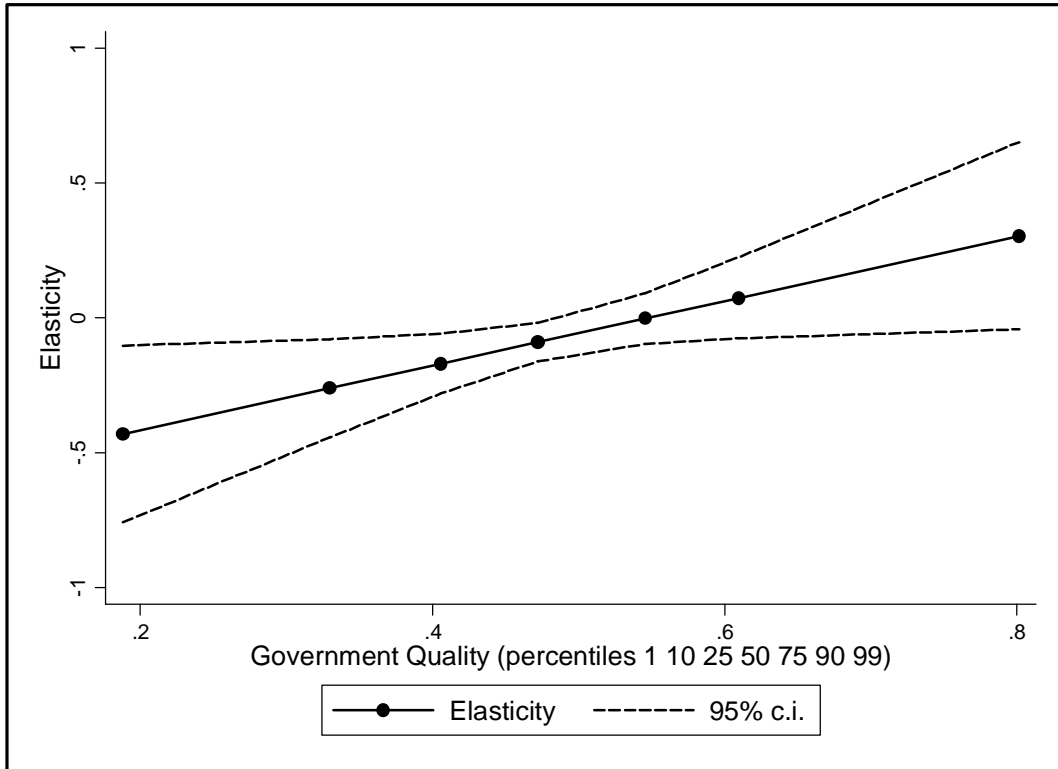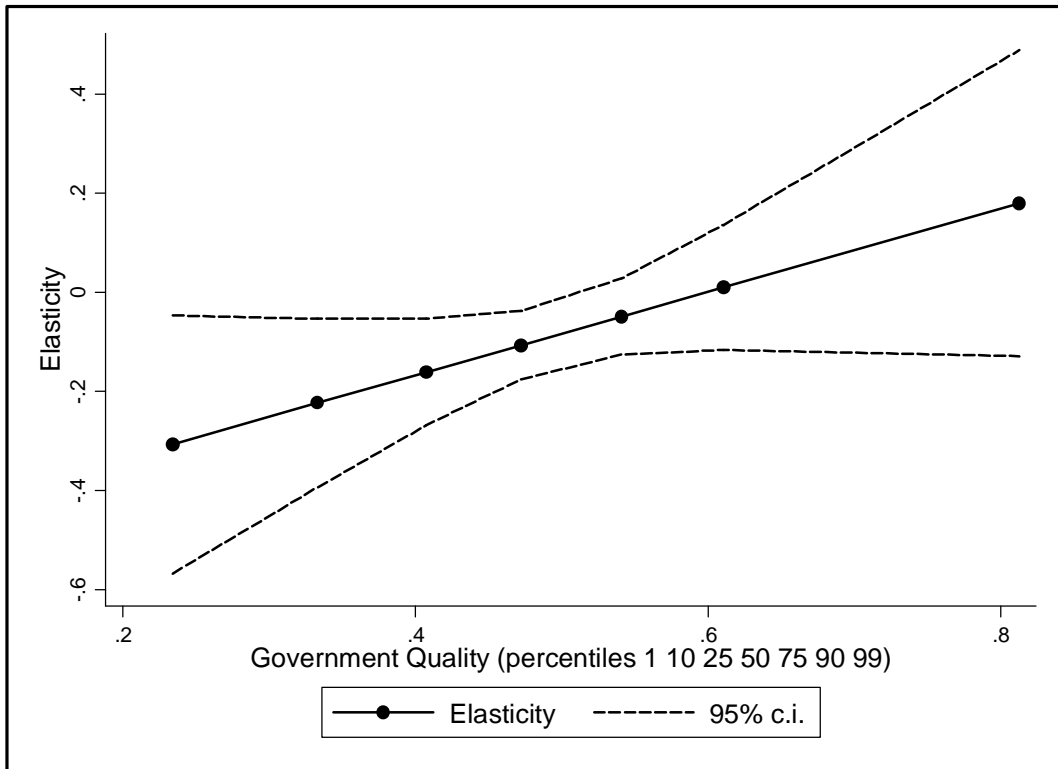**Figure 1: Plot of Elasticities – Private Credit**

Figure 2: Plot of Elasticities – M3

Figure 3: Plot of Elasticities – Bank Assets