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Financial Development and the "Growth-Inequality-Poverty" Triangle: A Comparative Study between Developed and Developing Countries

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ABSTRACT

The main objective of this paper is to study the effects of financial development on poverty reduction taking into account simultaneous effects on growth and inequality. In order to do so, we decided to make a comparative study between three groups of countries according to the chosen criterion income. We are going to build a model of simultaneous equations over the period 1990-2011. The results generated by this study has identified that financial development promotes economic growth and reduce poverty in middle-income countries and high income, whereas in low income countries financial system does not have a positive effect on these economies. The study showed also that financial development exacerbates inequality of income distribution in countries with low and middle income, while for high-income countries any improvement in the financial system resulted in a decrease in inequality.

Keywords: *Financial development, growth, inequality, poverty, simultaneous equations model.*

1. INTRODUCTION

The economic literature specializing in the relationship between financial system and poverty reduction shows that the majority of researchers are harnessed to study the effects of financial development on poverty reduction through the fruits of growth and neglect direct effects that could affect poverty reduction through the channel of credit, savings, insurance services and income inequality.

We therefore believe that the interest in the development, in recent decades, is to integrate growth and inequality in the relationship finance-poverty. We also see that the treatment of the triangle "growth-inequality-poverty" can give to the question of financial development its full extent. Added to their effects on growth, effects of financial development on inequality are fundamental in understanding their role in poverty reduction. As such, we see that the real challenge to design a development policy that reduces poverty is to understand these interactions. This is why the choice of this way of treating both of these effects is not a coincidence, given that the total effect of financial development cannot be understood, if we do not take into account simultaneously the direct and indirect effects.

This paper therefore falls outside the traditional framework, which seeks to study the effects of finance on poverty reduction only through the indirect channel growth and stain study the direct and indirect effects of financial development on reducing poverty, taking into account the simultaneous effects on growth and inequality Datt, G. and M. Ravallion (1992). We therefore considered appropriate to conduct our study on this topic and try to answer the following questions: Is there compensation between the positive effects of financial development on growth and the negative effects of financial development on inequality? What effect outweighs the other? Is that it is the positive effect through the channel of growth prevails or is the negative effect of inequality across the channel who wins?

The theoretical literature recommends that the financial system can contribute to poverty reduction in a direct way through access to credit, savings services and the services of insurance risk (Jalilian and Kirkpatrick, 2001) and indirectly through the channel of growth and inequality. Indeed, even some currents focused on growth as a necessary condition for poverty reduction, recent literature emphasizes the existence of situations in which a high rate of economic growth has coexisted with continued poverty (Holden and Prokopenko, 2001). Some explain this phenomenon by the fact that financial development generates increased inequality of income distribution will increase with the growth rate. The reason is that, for purely commercial reasons, banks do not give loans to households with adequate safeguards. However, the poor who are the most deprived quintile of society do not have the necessary guarantees and are therefore excluded from the formal financial system, this implies that only the rich have adequate safeguards that can access credit and benefit improvements in financial systems, such a scenario is exacerbating inequalities between the rich and the poorest quintiles of society.

Some empirical studies that have examined the relationship between financial development and the growth triangle-inequality-poverty (eg, Odhiambo (2009), Honohan (2004); Quartey 2005; Selim Akhter 2010, Sin-Yu Ho and Nicholas M. Odhiambo, 2011; Azra. D and al. 2012; Gazi, S. et al. 2012) show a positive and robust link between financial development and poverty reduction. Other studies find that the positive effects of financial development are undermined by growing inequalities generated by a maldistribution of the fruits of growth (Aghion and Bolton, 1997; Banerjee and Newman, 1993; Galor and Zeira, 1993 and Rajan and Zingales 2003). These studies show that lack of access to finance can be the main cause of the persistent generation of income inequality and extreme poverty, insofar as it is possible that in some cases, the beneficial effects of financial development on the poor are offset by rising inequality that can accompany growth.

It is clear from the presentation of approaches to economic literature on possible links between theoretical and empirical financial development and the growth-inequality triangle-poverty divergence of views as to the reality of these links. Indeed, there are some who believe that financial system developed conjugate of a proper legal and institutional environment, contributes to the improvement of growth and poverty reduction. On the contrary, other studies state that the effects of financial development can be mitigated by increasing inequality.

The interest of this study is to try to provide a few details on a topic that has been much discussed, namely the direct link between financial development and poverty reduction. Our study becomes even interest, because it concerns the developed and developing countries.

This paper, Therefore, stain to study the effects of financial development on poverty reduction, taking into account the simultaneous effects on growth and on inequality. We therefore regarded appropriate to conduit our study on this subject and try to answer this question. The rest of the paper will be organized as follow: The following section shows empirical model specification and describe the data, while section 3 presents the econometric analysis and results of estimations. Section 4 concludes.

2. EMPIRICAL MODEL SPECIFICATION, DATA AND ESTIMATION TECHNIQUES

2.1 Empirical Model Specification

To test the effect of financial development on the triangle "growth-inequality-poverty", we will operate in a simultaneous regression equations (poverty Equation (E_1), the growth equation (E_2) and inequality equation (E_3). Introducing a variable measuring financial development takes the form exogenous shock outside year. Based on Ravallion (1997), and Ravallion and Chen (1997), we model as a function of poverty a set of control variables That are commonly used as factoring explaining poverty: income inequality overalls to capture the kind of distribution of income, GDP per capita growth to capture the economic development, number of subscriber phone lines per 100 inhabitants as indicator to measure the quality of infrastructure and population growth.

We will include in the growth equation macroeconomic variables typically used in empirical work that determines growth rate: distribution of inequality, growth of the consumer price index to control for the macroeconomic environment (inflation), trade openness, government spending and human capital.

In the equation of inequality, we introduce the institutional variables that reflect how the distribution is made. We will add, also, in the same equation the growth rate and its square to test the hypothesis of Kuznets (1955). Moreover, the method by which it is customary to use when the endogenous variable in equation becomes exogenous variable in another equation is the method of simultaneous equations models. This method allows us to correctly distinguish the effects of financial development passing through growth and rising inequality.

Furthermore, in order to answer the main problem, we assume that financial development is the only explanatory variable common to all three equations. It is likely to affect simultaneously, in different ways, the three endogenous variables. The overall relationship of this model is explained in the following diagram:

$$P_{it} = \alpha_0 + \alpha_1 GDPG_{it} + \alpha_2 I_{it} + \alpha_3 FD_{it} + \alpha_4 POP_{it} + \alpha_5 TEL_{it} + \xi_{1it} \quad (E_1)$$

$$GDPG_{it} = \beta_0 + \beta_1 I_{it} + \beta_2 FD_{it} + \beta_3 OPEN_{it} + \beta_4 GS_{it} + \beta_5 H_{it} + \beta_6 INF_{it} + \xi_{2it} \quad (E_2)$$

$$I_{it} = \lambda_0 + \lambda_1 GDPG_{it} + \lambda_2 (GDPG_{it})^2 + \lambda_3 FD_{it} + \alpha_4 INST_{it} + \xi_{3it} \quad (E_3)$$

(i = 1, . . . , N; t = 1, . . . , T)

With P_{it} represent the index of poverty measured by household final consumption expenditure; GDPG design growth of GDP per capita; I represent income inequality measured by the Theil index; FD: an indicator of financial development; TEL: an indicator of infrastructure; POP represent the growth population; OPEN design trade openness; INF is an indicator of inflation; GS measure government spending; H an indicator of human capital and INST measure the quality institutions.

2.2 Data Source, Sample and Definitions of Variables

2.2.1 Data Source

Annual time series data, which covers the period 1990-2010, is utilized in this study. The data used in the study are obtained from different sources, including various series of the world Governance Indicators, World Bank and International Financial Statistics (IFS). The sample size and the period of our study are limited by the availability of data on poverty and finance indicators.

2.2.2 Sample

Highlighting the contribution of the effect of financial development on poverty is particularly difficult. The reason is certainly the strong subjectivity of economic and financial indicators often used to translate the improved level of well-being. The scarcity of data on poverty is a big problem especially when it comes to developing countries where there is the least information about this phenomenon, in particular because of economic information systems and statistics that are insufficiently developed. Therefore, the choice of the sample will be made based on the availability of statistical control variables.

We will try in this paper to test the effect of financial development on poverty reduction. More specifically, we will try to make a comparative study of three samples according to the standard income. Following the classification of the World Bank, we could build a database characterizing three samples around the world during the period 1990-2010: 22 low-income countries, 37 middle-income countries and 30 high-income countries. Although the economic history of each country cannot be the same, we believe that each group of countries we have chosen are similar in their economic structures, as well as financial, the political level, the regulatory level and social or cultural, reason we can emerge from our study of the political implications that will be adopted by all countries.

2.2.3 Definitions of Variables

Our model is supplemented by a series of variables typically used in these estimates. The variables of interest in our model are the rate of poverty, economic growth, income inequality and financial development. All variables are defined as follows:

Poverty:

In contrast to developed countries, time series data on poverty in many developing countries are very limited, and this, because many developing countries have started recording data on poverty only in the late 90s. Thus, a number of indicators for measuring poverty have been proposed in the literature. Some previous studies have used the database of Deininger and Squire (1996) and Lundberge and Squire (1998) that provide income and headcount data for the poor, as well as the Gini coefficient. Others have used the annual per capita income as a measure of poverty. Others have chosen to use the rate of population living within 1 or 2 $ per day. Unfortunately, these series do not extend over the entire period from 1990 to 2010 so that they can be used as a proxy for poverty. However, these indicators are not without critics. For example, the annual per capita income that was used in some previous empirical studies does not take into account other dimensions of poverty. In addition, studies have shown that consumption expenditure for the poor is usually more stable than income (see Woolard and Leibbrandt, 1999; Ravallion, 1992). For this reason, we will use in our study, consumption per capita as a proxy measure of poverty (see also Quartey, 2005; Nicholas M. Odhiambo (2009). This is consistent with the definition proposed by the World Bank which defines poverty as "the inability to reach the subsistence level of life" measured in terms of basic consumption needs (World Bank, 1990).

Growth:

We will choose to use the growth rate of GDP per capita as a proxy for economic growth. This indicator has the advantage of being available on CD-ROM World Bank for the majority of countries and for a long time.

Inequality:

In the empirical literature the income inequality is usually measured by the Gini index. One of the unique aspects of this work is the use of a new indicator of inequality other than the Gini index, which is not available for a long period and for all countries in our sample. This indicator is the Theil index that is provided by the University of Texas Inequality Project. It has the advantage of being present for the majority of countries in our sample.

Financial Development:

The empirical literature generally used the ratio of domestic credit to the private sector relative to GDP, the ratio of domestic credit provided by banking sector relative to GDP, the ratio of bank liquid reserves relative to bank assets, and the ratio market capitalization relative to GDP. The first three indicators measure the development of the banking sector, while the last variable is related to the development of capital markets. Financial development in this study is measured by aggregate constructing three measures of financial development using the Principal Component Factor method: the ratio of M2 to nominal GDP. Domestic Credit to Private Sector to GDP and domestic credit provided by Banking Sector to GDP. Note that due to lack of data on stock markets in some developing countries, we used in our study only a synthetic indicator on the banking market.

Note that a few superficial data on the stock markets of some countries in the sample published by international institutions (World Bank and IMF) are not sufficient to conduct empirical studies on this sector. The non-inclusion of this variable can be explained by the fact that financial system in some countries in our sample are dominated banking and development banking system is at the expense of stock market development in most of these countries. In time when developed countries were developing their financial markets gradually in parallel with their development bank, several developing countries have failed to develop their scholarship. We expect a positive and significant relationship between the indicator of financial development and the level of expenditure per capita consumption. On the contrary, if the coefficient is negative it means that a high level of financial development indicator reduces the welfare of the poor. This is a novelty of our study, since it has never been dealt with this way, to our knowledge.

Institutional Quality:

As we have already done to construct an indicator of financial development, we will also use the PCR method to construct the indicator of institutional and legal development (INST). This indicator is constructed from the six governance indicators[1]. The choice of this institutional variable was made so that it should look

[1] The indicators from which is constructed the variable "INST" are: voice and accountability, political stability no violence, control of corruption, rule of law, government effectiveness and regulatory quality.

synthetic, that is to say containing much information on the economic risk, political risk and social risk.

The interest of the decomposition of this variable is the inclusion of other institutional specific and appropriate to the study of financial development. The construction of this variable explains the interest of the institutional development in explaining inequality. It is logical therefore to study the effect of this synthetic variable on income inequality. The choice of this variable results in the fact that it can give how the distribution of income is made, and the extent of institutional distortions likely to increase inequalities.

Inflation:

This is the variable that represents macroeconomic policy. The choice of this variable is legitimized by the importance of adopting appropriate macroeconomic policy in the context of a policy of financial development. It is introduced into the model to capture the impact of macroeconomic stabilization on poverty. Inflation is a factor worsening poverty because it has a negative impact on the real value of assets and the purchasing power of household incomes, K. Kpodar (2006). It is measured by inflation, consumer prices (annual %) available in CD-ROM of World Bank.

Government Spending:

The choice of this variable results in the fact that it may be as representative of the potential role of the state in the accumulation process of economic growth and reducing inequality.

Trade Openness:

Defined as the sum of exports and imports as a share of GDP, it is introduced into the model to capture the degree of international openness.

Number of subscriber telephone lines per 100 inhabitants:

This variable is introduced into the model to capture the role of infrastructure in reducing poverty. It represents the degree of development in the field of information technology and communication, which is a sector that could have a positive influence on the development of the financial sector by encouraging financial innovation and facilitating access to credit by the poor and the finalization of financial transactions.

Human Capital:

Measured by Secondary School Enrollment Rate (%) total. Studies by Barro (1991, 1997), Benhabib and Spiegel (1994) emphasize that the level of education was an important determinant of future economic growth. It is expected that investment in human capital enhances the productivity of individuals and their welfare. This is measured by the share of the population that has attained a high school compared to the total population (over 25 years).

2.3 Estimation Techniques

The study of several models such as financial development, growth, inequality and poverty requires consideration of the problem of endogeneity as the tested variables interact simultaneously. In our case, there are strong reciprocal causality between these factors, which we refer to problems of endogeneity and simultaneity. Estimation methods that can be used in the context of simultaneous equation models are functions of identification criteria for estimating the model and the endogeneity problem. In our case, the model presented is over-identified. On the other hand, our model is characterized by the presence of an endogeneity problem of order two, by definition, why the estimate by the method of least squares would be triple registered (for details on the method used, it is recommended to refer to the work of Bourbonnais (2002)). This estimation method is based on the principle of application of the method of least squares in three stages. A technique for solving endogeneity problems is to introduce the variables at the root of these problems as instrumental variables. However, treatment with the Stata allows a resolution using the method "3 SLS". In order do so, a series of econometric tests will be conducted on the usual set of equations and variables in the model estimated. This is, first, the stationarity tests and bivariate collinearity.

Some works adopt the same methodology to study the growth-poverty relationships and growth-inequality, Lundberg and Squire (2003). But to our knowledge, no empirical work, unless error on our part, has treated simultaneously quadrilateral relationship between financial development, growth, inequality and poverty. In this respect, our study differs from previous empirical work by the addition of a specific equation of poverty to test the total effect of financial development and to detect interactions with the triangle “growth, inequality and poverty”.

3. RESULTS AND INTERPRETATIONS

The main objective for this study is to evaluate the contribution of financial development to growth, inequality and poverty. We have to compare the effects of financial development on poverty reduction according to the criterion income. The application of simultaneous equations regressions can meet this goal. The estimation results are shown in tables 1, 2 and 3 in the appendix.

The estimation results show that the growth rate of GDP per capita has a positive and significant effect on poverty reduction whatever the sample. This result is consistent with the results of Dollar and Kraay (2000), in which high levels of growth rates are associated with low levels of poverty rate, which confirms the theoretical predictions providing the leading role of economic growth in reduction poverty.

On the effects of inequality on poverty incidence, the results show that the coefficients are positive and significant for all three groups of countries, which confirms their robustness. Thus, an increase in the level of

inequality, as measured by the Theil index, actually worsens the poverty rate. This supports once more and in accordance with theoretical predictions, the determinism of the distribution of income in reducing poverty. This suggests that the most effective method to reduce the poverty rate is certainly reducing inequalities by means of a better redistribution of wealth.

Moreover, if the adverse effect of income inequality on the poverty rate is largely confirmed, the effect of financial development on poverty reduction, which interests us most in this study, seems to be specific to each group of countries. The coefficient of the indicator of financial development appears to be negative and significant for the first group formed by low-income countries, and significantly positive for middle-income countries and high income countries. This result is somewhat logical since, according to the economic literature on the subject, financial development has a positive and significant effect on the reduction of poverty when it exceeds a certain threshold, usually assumed attained in developed and emerging countries. Whereas, for low-income countries where the financial system is still unable to offer financial services to all segments of society, finance may not have beneficial effects on poverty. We also believe that this negative effect of financial development on poverty reduction in this first group is mainly due to two reasons: first, the financial sector in low-income countries are not yet sufficiently developed and remain strong and illiquid, limiting access to long-term financing and reduces, therefore, the ability of different countries of the sub-group to be financed by local debt. Second, there is a lack of innovative financial instruments, in particular those aimed at small and medium enterprises most of which are too often confined to the informal sector, due to the inadequacy of financial services.

Moreover, banking crises are also a main argument explaining the decline in the level of well-being in these countries. All these factors combined with the weakness of the legal environment, the deterioration of the macroeconomic environment (low growth, inflation levels and budget deficit levels...) and weak regulation of the financial system have made these countries poorest economies in the world. However, in recognition of the importance of the financial sector in the process of poverty reduction, the middle-income countries and high have managed to keep reform plans and financial openness in the hope of improving performance thereof. Along with this, the authorities of financial supervisory have focused more on the prudential regulation of financial institutions, in order to introduce greater transparency. It is necessary to encourage local and foreign investors. In this scenario, has enabled these groups of countries to receive benefit from the fruits of the financial system.

As for the indirect effects of financial development on poverty reduction through the channel of growth and inequality, we find that they vary depending on the sample considered. We note specifically that he has no significant positive effect on economic growth (the first indirect channel) than for middle-income countries and high, while their effects appear to be significantly negative for low income countries. This result suggests that, contrary to theoretical work which assumed that finance is conducive to long-term growth, financial development is not always a catalyst for growth especially for economies with weak legal environments, degradation of macroeconomic environments (levels of inflation and high budget deficit) and weak regulation of financial systems. In this context, Samouel Beji (2007) explains this adverse effect of financial development by the absence of a sound financial system, solid and well structured. In addition, this deficiency in the financial system can be explained by several factors affecting their development, including low income, lack of an effective system of recording guarantees, weak judicial institutions, sensitivity to external shocks and especially the scarcity of human capital and inadequate financial infrastructure.

Regarding the indirect effect of financial development on poverty reduction through inequality, results in the three tables show that this effect varies depending on the sample studied. We note that the coefficients of the Theil index show significantly positive for countries with low and middle income. These results are consistent with the theoretical analysis and predict that more financial development increases, the gap between the richest quintile and the poorest increases. On the contrary, for the third group of countries, this coefficient appears to be negative and significant thus providing, that as far as the financial system develops, the gap between rich and poor is shrinking. We believe this can be explained by the fact that the institutional variables that reflect the quality of governance affect directly the interactions between economic agents in high-income countries (assumed generally more developed) such as property rights, the administrative procedures and the operation of the public sector. This is the case for a fairer redistribution and may help reduce inequalities.

The Kuznets hypothesis has been tested in our model through the introduction of the growth rate of GDP per capita and the quadratic effect through the introduction of its square show that the Kuznets curve is checked only for middle-income countries. Indeed, the results of the first group show that the rate of growth reduced inequality between people in the short term, for long term, the non-significance of the coefficient of the square of the growth rate does not allow us to conclude its effect. For high-income countries, the coefficients of the growth rate of GDP per capita and its square show signs negative and significant, implying that the growth rate decreases inequality, both in the short term as long term. We believe that in developed countries generally characterized by the strength of their political institutions, low corruption, adequate monitoring systems, the benefits of growth are distributed in an egalitarian manner among people.

We believe that the differences recorded in terms of growth and poverty reduction, between developed and developing countries may be mainly due to two reasons: first, developed countries, unlike developing economies, benefit from the economic scales thus reducing the costs of training personnel. However, it is essential to economic development. According to Collier (2007), economic development is the result of the construction of appropriate economic policies adapted on the basis of the correction of errors of previous policies.

Second, the weak of economic scale in developing countries may also explain their instability. Indeed, poor countries generally have very limited capacity to finance the systems of security necessary to internal stability. Therefore, these countries have difficulty in controlling social unrest and ethnic eventually turn into violence and conflict. These elements are likely to delay economic takeoff.

Finally, we think that the differences recorded between the country's levels of financial development can be explained by differences in the degree of development of their devices legal and institutional quality. These systems are themselves influenced by other factors, such as the legislative tradition of the country (according to the theory of law and finance), the nature of political systems, natural and initials endowments available in an economy and other factors specific to each country.

4. CONCLUSION AND POLICY IMPLICATIONS

Throughout this work, we tried to study the effects of financial development on poverty reduction. Overall, the results generated by this study has identified initially that financial development promotes economic growth and reduce poverty in middle-income countries and high income, whereas in low income countries financial system does not have a favorable effect on these economies. The study showed also that financial development exacerbates inequality of income distribution in countries with low and middle income, while for high-income countries any improvement in the financial system resulted in a decrease in inequality. We identified at this level, the effect of financial development on poverty reduction depends on the magnitude and sign of the effects of financial development on inequality and growth.

In a second step, estimates show that institutional quality plays a decisive role in the relationship between financial development and the triangle growth-inequality-poverty. It largely explains how income is distributed to the population. It is therefore an undeniable part in the process of understanding the levels of inequality and their variations.

The policy implications of the analysis in this work are clear: first financial development should be encouraged. Second, it seems necessary that governments should act as regulator and supervisor agent of corruption, allowing formalizing models for the poorest access to formal and informal finance. Without forgetting the essential role played by institutions in the distribution of wealth and poverty reduction. That for this reason it is rational to believe that efforts to improve the quality of institutions and the political environment are also a necessary condition for the success of financial development. Another equally important measure is to stimulate infrastructure spending to profitable financial opportunities created by the financial systems developed to enable the poor to access financial services.

It also requires that the Government must do more direct contact with the market and the banks. Such actions of policy intervention should normally facilitate institutions providing financial services to the poor. In addition, it should foster cultures of households to invest in profitable projects. Political solutions must be tailored to the problems of the financial sector.

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APPENDIX

Table 1: Robustness analysis results of the regression model on the effects of financial development on growth, inequality and poverty: the case of low income countries

Variables	Poverty	Growth	Inequality
GDPG	0.074	--	-0.036
	(2.13)**		(-2.08)**
THEIL	-0.833	-0.261	--
	(-1.64)*	(-1.97)**	
FD	-0.009	-0.007	0.006
	(-1.71)*	(-1.92)**	(2.85)***
POP	-0.226	--	--
	(-7.38)***		
TEL	-0.011	--	--
	(-2.51)***		
INF	--	-0.028	--
		(-0.89)	
H	--	-0.02	--
		(-0.61)	
GS	--	0.036	--
		(1.80)*	

OPEN	--	0.003	--
		(0.2)	
INST	--	--	-0.001
			(-2.04)**
GDPG2	--	--	0.039
			(1.22)
Constant	0.605	-0.046	0.059
	(57.77)***	(-3.88)***	(44.61)***
Observations	484	484	484
R2	0,14	0,15	0,14

Notes: * significant at 10% ** Significant at 5%; *** Significant at 1%. GDPG means the growth rate of GDP per capita; Theil represents the index of income inequality; FD is the indicator of financial development, it is constructed by applying the method of Principal Component Analysis on three variables : domestic credit to the private sector, the domestic credit provided by banking and M2 to GDP ratio. TEL is an indicator of infrastructure as measured by the number of subscriber telephone lines per 100 inhabitants, INF is the inflation rate; H design human capital, is measured by secondary school enrolment; GS measure public spending; OPEN is an indicator of trade openness; INST is an indicator of institutional quality, it is constructed by applying the method of Principal Component Analysis on the six governance indicators and finally, $GDPG^2$ that represent the square of the growth rate of GDP per capita.

Table 2: Robustness analysis results of the regression model on the effects of financial development on growth, inequality and poverty: the case of middle-income country

Variables	Poverty	Growth	Inequality
GDPG	0.186	--	0.149
	(3.46)***		(5.67)***
THEIL	-0.671	0.215	--
	(-1.82)*	(4.12)**	
FD	0.01	-0.14	0.178
	(1.95)**	(-1.73)*	(3.32)***
POP	-0.001	--	---
	(-1.19)		
TEL	0.511	--	--
	(2.58)***		
INF	--	-0.003	--
		(-1.87)*	
H	--	0.005	--
		(0.57)	
GS	--	0.063	--
		(4.18)*	
OPEN	--	0.009	--
		(1.7)*	
INST	--	--	-0.001
			(-2.04)**
GDPG2	--	--	-0.011
			(-2.03)**
Constant	0.55	-0.096	52.2
	(76.57)***	(-5.38)***	(34.4)***
Observations	814	814	814
R2	0,3	0,16	0,13

Notes: * significant at 10% ** Significant at 5%; *** Significant at 1%. GDPG means the growth rate of GDP per capita; Theil represents the index of income inequality; FD is the indicator of

financial development, it is constructed by applying the method of Principal Component Analysis on three variables : domestic credit to the private sector, the domestic credit provided by banking and M2 to GDP ratio. TEL is an indicator of infrastructure as measured by the number of subscriber telephone lines per 100 inhabitants, INF is the inflation rate; H design human capital, is measured by secondary school enrolment; GS measure public spending; OPEN is an indicator of trade openness; INST is an indicator of institutional quality, it is constructed by applying the method of Principal Component Analysis on the six governance indicators and finally, $GDPG^2$ that represent the square of the growth rate of GDP per capita.

Table 3: Robustness analysis results of the regression model on the effects of financial development on growth, inequality and poverty: the case of high-income countries

Variables	Poverty	Growth	Inequality
GDPG	0.123	--	-0.075
	(2.43)***		(-2. 8)***
THEIL	-0.225	-0.246	--
	(-3.69)***	(-4.04)**	
FD	0.015	-0.007	0.026
	(4.4)***	(-1.92)**	(4.4)***
POP	-1.38	--	--
	(-6.74)***		
TEL	0.010	--	--
	(0.58)		
INF	--	-0.006	--
		(-2.59)***	
H	--	0.010	--
		(0.45)	
GS	--	0.04	--
		(1.78)*	
OPEN	--	0.037	--
		(4.72)***	
INST	--	--	-0.001
			(-1.90)**
GDPG2	--	--	-0.011
			(-2.03)**
Constante	0.025	0.042	0.026
	(9.81)***	(2.22)**	(22.44)***
Observations	660	660	660
R2	0,18	0,18	0,11

Notes: * significant at 10% ** Significant at 5%; *** Significant at 1%. GDPG means the growth rate of GDP per capita; Theil represents the index of income inequality; FD is the indicator of financial development, it is constructed by applying the method of Principal Component Analysis on three variables : domestic credit to the private sector, the domestic credit provided by banking and M2 to GDP ratio. TEL is an indicator of infrastructure as measured by the number of subscriber telephone lines per 100 inhabitants, INF is the inflation rate; H design human capital, is measured by secondary school enrolment; GS measure public spending; OPEN is an indicator of trade openness; INST is an indicator of institutional quality, it is constructed by applying the method of Principal Component Analysis on the six governance indicators and finally, $GDPG^2$ that represent the square of the growth rate of GDP per capita.

Appendix 3: List of the sample countries

Sample	Countries
Low income	Bangladesh, Benin, Burkinafaso, Central African Republic, Congo Democtratic Republic, Eriteria, Ethiopie, Gambia, Guinea, Haiti, Kenya, Liberya, Madagascar, Mozambique, Nepal, Rwanda, Sierraleone, Tanzania, Togo, Uguanda, Zambabwe.
Middle income	Albania, Algeria, Angola , Argentina, Armenia, Bolivia, Brazil, Bulgaria, Cameroun, Chile, Cote-Ivoire, Ecuador, Egypte, Elsalvador, Ghana, Hunduras, Indonesia, Jordon, Lebanon, Malysia, Mexico, Morroco, Pakistan, Panama, Paragway, Perou, Phillipine, Romania Senegal, Sirilanka, Sudan, Syrie, Thailand, Tunisie, Turkey, Ukraine , Urugway.
High income	Australia, Austria, Belguim, Canada, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Irland, Italy, Japon, Korea Republic, Luxumbourg, Netherlands, New Zeland, Norway, Poland, Portugal, Singapore , Slovenia, Spain, Sweeden, Switzerland, United Kingkdom, USA, Croitia.