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## Financial Development and Distribution of Income in Low Income and Lower-Middle-Income Countries

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### Abstract

While there are studies on the nexus between financial development and income distribution, there seems to be no consensus established. There are also theoretical grounds for both a positive and negative relationship between these variables. This study empirically examines the relationship between financial development and the distribution of income in low-income and lower-middle-income countries. To this effect, a dynamic panel estimation technique, the system Generalized Method of Moments, is employed on a dataset covering 44 economies over the period 1995-2010. Unlike most of the empirical literature on the subject, to capture the development level of financial institutions and financial markets in terms of their depth, access, and efficiency of the countries considered, the study used a comprehensive index proposed by IMF. And Gini coefficient is used as an indicator for income inequality. In addition to the main variable of interest, other variables that have been found important in the determination of income inequality in previous research, like GDP per capita, human capital, inflation, government consumption, openness, and unemployment are used as control variables. The findings of the study indicate the existence of a U-shaped relationship between financial development and income inequality. Financial development decreases income inequality until the development reaches a certain level. Beyond that level, however, as financial development continues further, it increases inequality. The results also provide evidence for the Kuznets curve hypothesis, indicating an inverted U-shaped relationship between GDP per capita and income inequality.

**Keywords:** Financial development, income inequality, LI, LMICs

### 1. Introduction

The positive impact of financial development on economic growth has been well-established by extensive theoretical literature and empirical evidence (Beck, Levine, & Loayza, 2000; Christopoulos & Tsionas, 2004; Demirguc-Kunt, 2006; Ross Levine, 1997; R. Levine & Zervos, 1998). By and large, both financial institutions and financial markets developments are shown to be highly correlated with the subsequent growth of the economy.

Financial development refers to improvements in access to as well as on the effectiveness and efficiency of financial intermediation and market services. As the financial sector of a country consists of a range of financial institutions and markets as well as different financial products, quantifying its level of development in a manner that can capture all of the sector



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aspects is not a simple task if it is possible at all. Proxies for financial development that have been commonly used by much of the previous empirical research include the bank capital to assets ratio, private credit to GDP ratio, and other similar measures. However, it has been argued that these measures do not provide a sufficient basis for assessing financial development. They neither reflect the financial market section of the sector nor the quality, efficiency, and stability of the services. As an alternative to these measures, the World Bank has identified four sets of proxy variables for measuring both financial institutions and market development: depth, access, efficiency, and stability (World Bank, 2012).

The difference in the level of financial development between developing and developed countries is not something to argue about. Even in recent years, the developing world lags behind developed economies in terms of financial accessibility, infrastructure, and product variety. Most developing countries now acknowledge the benefits that can be attained from financial sector development, and have gradually instituted financial sector reforms in the hopes of developing the sector, and therefore the overall economy. These, financial sectors, while generally still shallow, are experiencing fairly rapid growth. Nevertheless, the issue of which part of society benefits from the development has not been sufficiently investigated. Moreover, the existing literature on the subject differs on whether financial reforms are associated with narrowing or widening income disparities within developing countries (within-country income inequality, WCII).

Income inequality is typically higher in developing and emerging economies than in developed economies. According to the UNDP (2013), between 1990 to 2010, income inequality in developing countries has increased by 11 percent, whereas it increased by 9 percent in developed countries. Likewise, World Inequality Report 2018, stated that between 1990 to 2016, income inequality in the Middle East, Sub-Saharan Africa, and Brazil had remained stable at extremely high levels (Piketty, Alvaredo, Chancel, Saez, & Zucman, 2017). This high level of income and wealth disparity has raised concerns in many lower-income and lower-middle-income countries (LI and LMICs, henceforth). In addition to detecting the direction of its effect on economic growth, explaining and identifying the drivers of the observed trend and magnitude of the inequality has been attracting the focus of scholars and policymakers.

This study aims to empirically assess the link between financial development and the distribution of income in LI and LMICs. It extends the existing literature in three dimensions. First, a recently developed index of financial sector development (Svirydzenka, 2016) is employed in the empirical tests. The indicator is composed of nine indices that assess the depth, access, and efficiency of both financial institutions and financial markets. So, unlike most of the empirical literature on the subject, the effort is not to assess the impact of only one or two aspects of the development, but a more holistic measure of development and the multi-dimensional impact on income distribution. Second, the sample is restricted to LI and LMICs. This is important because as it has been already noted, income inequality in these countries has remained stubbornly high, despite more than two decades of economic and financial reforms. Finally, given the possibility of financial development determined by the other variables that determine inequality, ignoring such endogeneity would be very problematic. Thus, the



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estimation employs the system Generalized Method of Moment (GMM), which is so far the ideal technique to investigate dynamic relationships among variables.

The remainder of this paper is organized as follows. While section 2 describes an overview of related literature, section 3 explains the dataset used (section 3.1.) and the econometric method employed (section 3.2.). The results and findings of the analysis are presented and interpreted in section 4. The 5th section concludes the discussion.

## 2. Overview of related literature

There is extensive literature on the link between economic growth and inequality, as well as financial development and economic growth. Kuznets (1955), perhaps the pioneer economist in the study of income inequality, theorized that economic growth first increases but ultimately decreases inequality in income distribution, resulting in an inverted-U-shaped relationship between the two variables. Since then, the empirical validity of this “Kuznets curve” has been intensively investigated by many researchers but the results have been mixed.

More recently, economists have started to consider the link between financial sector development and income inequality. Yet again, conflicting predictions have been provided by different theorists on the subject. While some theories claim that a developed financial sector reduces income inequality, others predict an inverted-U-shaped relationship between the two.

The belief that a developed financial sector reduces income inequality is based on the assumption that increased access to finance for economically poor individuals reduces income inequality (Aghion & Bolton, 1997; Galor & Zeira, 1993). This is due to the fact that poor individuals, oftentimes, face information and transaction costs associated with the lack of collateral and credit histories, and a well-developed financial sector reduces these costs and barriers.

On the other hand, Greenwood and Jovanovic (1990) present a theoretical model that predicts a positive correlation between financial development and economic growth at all levels of development and a non-linear relationship between financial development and income inequality. According to this model, at the early stages of financial development only wealthy individuals can afford to access and directly profit from improved financial markets, hence the distribution of income across the economically rich and poor widens. But eventually, as the economy develops, more individuals can access financial markets and thus the distribution of income across people becomes stable.

Both individual and cross-country empirical studies also have not been consistent on the sign of the effect finance exerts on income inequality. Using the ratio of private credit by financial intermediaries to GDP as a measure of financial development, Beck, Demirguc-Kunt, and Levine (2007) assess its impact on changes in the distribution of income and changes in both relative and absolute poverty. They find that not only financial development reduces income inequality, but relatively poor individuals benefited disproportionately from such developments. Likewise, Batuo, Guidi, and Mlambo (2010) find a negative relationship between financial sector development and income inequality. Using a panel data set from 22 African countries for the period between 1990 to 2004 and by constructing an aggregate financial development index made of liquid liability, M2 (Money and quasi money), and



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domestic private credit, they did not find any support for an inverted U-shaped relationship between financial sector development and income inequality. More recently, Zhang and Naceur (2019) conducted a more multidimensional examination on the subject. Unlike the majority of other studies, they considered the access, depth, efficiency, stability, and liberalization aspect of finance to account for their effect on income distribution using a dataset of 143 developed and developing countries between 1961 to 2011. Their results suggest that while financial access, depth, efficiency, and stability reduce income inequality and poverty, financial liberalizations tend to widen the gap in income distribution and poverty. They also pointed out that between financial institutions and financial markets, financial institutions' development has a stronger impact on income distribution and poverty.

On the other hand, various empirical studies found a non-linearity in the relationship between financial development and income inequality. For instance, Kim and Lin (2011) provided evidence supporting the inverted-U-shaped relationship. They employed Private Credit, Liquid Liabilities, and Bank Assets as measures of financial intermediary development and Market Capitalization, Turnover Ratio, and Value Traded as measures of stock market development. Their dataset was composed of a panel of developing and developed countries over the period 1960–2005. Their analysis found that both financial intermediary development and a stock market benefitted the economically poor more than the rich resulting in an improvement in income distribution. But, according to their analysis, this can only occur after the country has reached a certain threshold level of financial development. Otherwise, below that threshold, financial development hurts the poor more and aggravates income inequality. Likewise, a study by Nikoloski (2013) also reported a similar relationship between the two variables. The study uses private credit as a measure of financial development and uses a dataset composed of information from 76 developed and developing countries over the period 1962 and 2006.

Some researchers (Park & Shin, 2017; Tan & Law, 2012), on the other hand, have found a U-shaped relationship between the two variables suggesting that financial development contributes to reducing inequality up to a point, but as financial development proceeds further, it contributes to greater inequality

Contrary to these findings, however, are works of research that find a negative relationship between financial development and income inequality. For example, using a dataset of up to 138 developed and developing countries over the years 1960–2008 and credit to GDP as a measure of financial development, Jauch and Watzka (2016) found that financial development increases within countries' income inequality. Seven and Coskun (2016) also reported a statistically significant positive relationship between bank development and income inequality in 45 emerging countries over the period 1987–2011. However, they failed to find any significant relationship between stock market development and income distribution.

Overall, previous research on the subject of financial development and income distribution has shown conflicting results. The spectrum ranges from linear positive association to negative association, and from U-shaped relationship to inverted-U-shaped relationship. Moreover, the indicators used to measure financial development in most of the studies do not provide an adequate framework for evaluating the relationship. Frequently the indicators used only tell the



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story of banking or the financial institutions' side of the system, and say nothing about markets, the other half of the financial system.

## 3. Data and econometric methods

### 3.1. Description of dataset

Data on the dependent variable, income inequality, is obtained from the 8<sup>th</sup> version of a

*Table 1: The Sample*

Region	Countries
Sub-Saharan Africa	Burkina Faso, Burundi, Côte d'Ivoire, Cameroon, Central African Republic, Ethiopia, Gambia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Tanzania, Uganda, Zambia
East Asia & Pacific	Cambodia, Indonesia, Mongolia, Philippines, Vietnam
The Middle East & North Africa	Egypt, Morocco, Tunisia, Yemen
Latin America & Caribbean	Bolivia, El Salvador, Honduras, Nicaragua
Europe & Central Asia	Kyrgyzstan, Moldova, Tajikistan, Ukraine
South Asia	Bangladesh, India, Nepal, Pakistan

Standardized World Income Inequality Database (SWIID) created by Solt (2019), which in turn is compiled from a number of sources. It is measured by the Gini index of inequality defined by household disposable income. Gini index is the most commonly used measure of income distribution among individuals or households. It ranges from 0 to 1, with a higher score representing greater inequality.

The sample consists of LM and LMICs based on the World Bank's country income classifications for the 2020 fiscal year (for further details see World Bank (2019a)). The reasons for confining the analysis solely to these countries are threefold; 1) due to structural differences in socio-economic as well as the political environment, these countries may have different determinants of income distribution compared to high-income countries; 2) unlike high-income countries, in recent decades many LM and LMICs have experienced rapid financial development and also have some of the highest levels of income inequality globally; 3) focusing on a specific group of countries enable the analysis to reduce sample heterogeneity. However, in contrast to high-income countries, time-series data on income inequality in many LM and LMICs is very limited. The final sample consists of 44 countries (Table 1), for which data on the inequality index is available. The choice of these countries is entirely based on data



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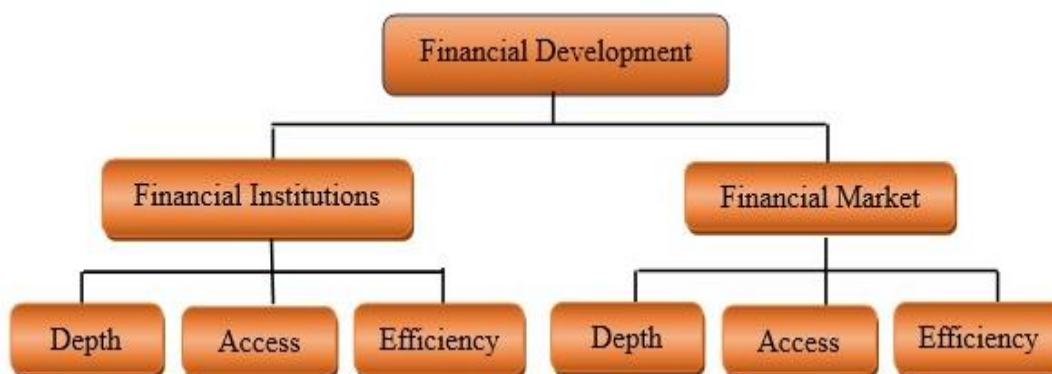
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availability for a sufficiently long period of time with respect to the variables used in the analysis. The sample period of the study is between 1995 to 2010.

As a measure of financial development, the study uses a comprehensive index proposed by IMF (Svirydzenka, 2016). The index takes values between 0 and 1, with the extremes referring to the lowest and highest respectively. To create this index the author first constructs a total of six indices that assess the level of financial development across countries. These sub-indices include depth, efficiency, and accessibility of financial institutions and financial markets.

A set of key indicators were chosen to construct these sub-indices. For instance, for financial institution depth index, private-sector credit, pension fund assets, the mutual fund assets, and insurance premium are taken into calculation. Bank-specific indicators like the number of bank branches and ATMs for access index, and saving mobilization efficacy, operational efficacy, and profitability for efficiency index were used. Furthermore, for the financial market development sub-indices, features of the respective countries' stock markets and debt markets development indicators such as market capitalization, volume, turnover, and the like were used. These sub-indices, then, were aggregated into two higher-level sub-indices that measure the overall development of financial institutions and financial markets independently. Finally, these two indices again aggregated into an index that measures the overall financial development. Figure 1 illustrates how the index is constructed.

Figure 1: Components of the financial development index



Source: Svirydzenka (2016)

The average financial development indices for the 44 LI and LMICs that are considered in the study have been increasing between 1995-2010 in both institutions (financial institution development index-FIDI) and markets (financial market development index-FMDI) front (figure 2). This had resulted in an overall improvement in the financial sector (financial development index-FDI). However, the development had been significantly affected by the 2008 financial crisis. Especially, the average FMDI in these countries had been hard hit, causing it to decline back to almost 2003 levels.

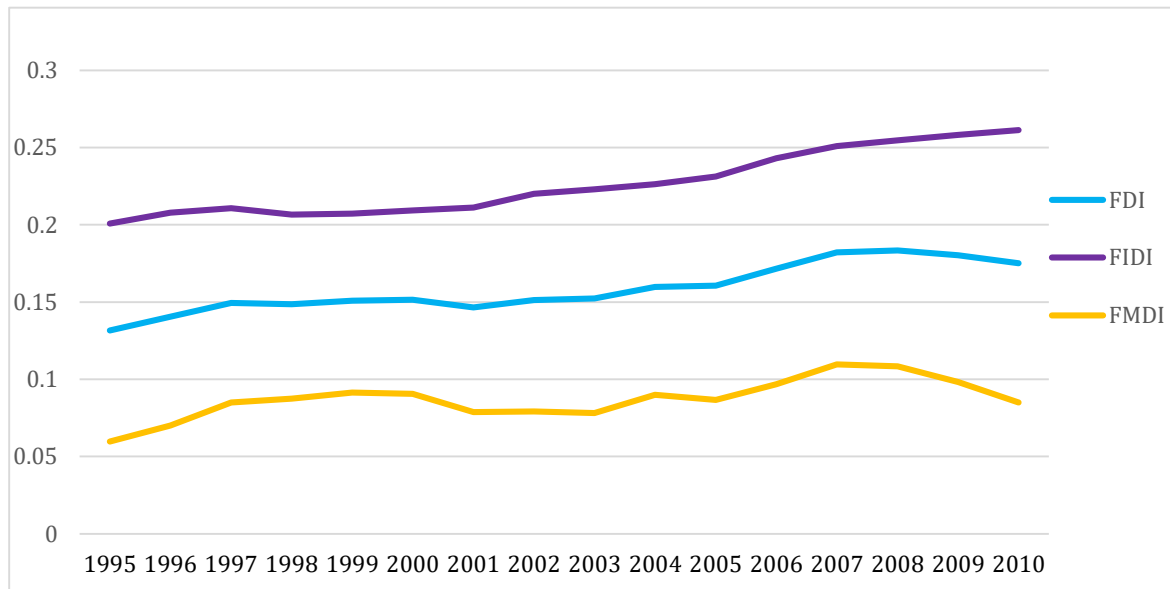


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Figure 2: Average Financial Development Indices, 1995-2010



Sources: Svirydzenka (2016); authors' calculations

In addition to the main variable of interest, financial development, various control variables are also included to account for other important factors that might have effects on income inequality. In line with previous literature, GDP per capita, human capital, inflation, government consumption, openness, and unemployment are used as control variables. Definitions of the variables and sources of all variables used in this paper are provided in Table 2.

Table 2: Overview of variables and sources

Variable	Definition	Source
<b>Gini</b>	Gini index of inequality in equivalized (square root scale) household disposable (post-tax, post-transfer) income	Solt (2019)
<b>Financial development</b>	Financial Development Index: an aggregate of nine indices that summarize the development level of financial institutions and financial markets in terms of their depth, access, and efficiency.	Svirydzenka (2016)
<b>GDP per capita</b>	Gross Domestic Product per capita at constant 2010 US \$.	World Development Indicators, (The World Bank, 2019b)
<b>Human capital</b>	Human capital index, based on years of schooling and returns to education.	Penn World Table, Feenstra, Inklaar, and Timmer (2015)



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<b>Inflation</b>	Inflation, as measured by the consumer price index, reflects the annual percentage change	World Development Indicators, (The World Bank, 2019b)
<b>Unemployment</b>	The share of the labor force that is without work but available for and seeking employment	World Development Indicators, (The World Bank, 2019b)
<b>Openness</b>	Sum of exports and imports of goods and services measured as a share of GDP	Penn World Table, Heston, Summers and Aten (2012)
<b>Government consumption</b>	Total General government final consumption as a percentage of GDP	World Development Indicators, (The World Bank, 2019b)

### 3.2. Econometric estimation technique: Dynamic data model

Panel data analysis is used to examine the effect of financial development on inequality in LI and LMICs. Panel data analysis is appropriate for the dataset because it is comprised of multiple countries and annual observations. It brings out individual heterogeneity and allows for the identification of effects that are not easily detected in time series or cross-sectional analysis. Following the regression specifications from the income distribution and financial development literature, the basic model is specified as follows;

$$Gini_{i,t} = \beta_0 + \beta_1 FD_{i,t} + \beta_2 FD_{i,t}^2 + \beta_3 GDPpc_{i,t} + \beta_4 GDPpc_{i,t}^2 + \beta_5 Z_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where  $i = 1, \dots, N$  and  $t = 1, \dots, T$  respectively denote country and time period.  $Gini_{i,t}$  is the logarithm of the Gini index,  $FD_{i,t}$  is financial development index,  $GDPpc_{i,t}$  is the logarithm of GDP per capita, and  $Z_{i,t}$  is a set of control variables that include: the logarithm of human capital, inflation, the logarithm of unemployment, the logarithm of openness, and the logarithm of government consumption.  $\varepsilon_{i,t}$  represents the idiosyncratic disturbances. To control for the Kuznets curve and to check for the existence of a non-linear relationship between financial development and inequality, the quadratic forms of both GDP per capita and financial development index are included in the model.

The hypothesis that there is a linear negative relationship between financial development and income inequality leads to the prediction of a negative and significant coefficient ( $\beta_1$ ) on  $FD_{i,t}$ , and a coefficient ( $\beta_2$ ) on  $FD_{i,t}^2$  that is not significantly different from zero. Alternatively, the hypothesis that there is an inverted U-shaped relationship between financial development and income inequality leads to the prediction of a positive and significant coefficient ( $\beta_1$ ) on  $FD_{i,t}$ , and a negative and significant coefficient ( $\beta_2$ ) on  $FD_{i,t}^2$ .

Following Jauch and Watzka (2016), to estimate Eq. (1), a system GMM estimation is applied. Outlined by Arellano and Bover (1995) and subsequently fully developed by Blundell and Bond (1998), the estimator has been used by many income inequality empirical researches. Considering the possibility of the endogeneity of some variables in the model (i.e., financial development and GDP per capita), GMM is the appropriate method. Moreover, for samples





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where the number of units, such as countries, is small, like this study's case, this estimator works better than the first-difference GMM (Soto, 2009). Thus, under this approach, the above model evolves to;

$$Gini_{i,t} = \alpha Gini_{i,t-1} + \beta_1 FD_{i,t} + \beta_2 FD_{i,t}^2 + \beta_3 GDPpc_{i,t} + \beta_4 GDPpc_{i,t}^2 + \beta_5 Z_{i,t} + \delta_i + \varepsilon_{i,t} \quad (2)$$

The term  $\delta_i$  denotes country fixed effects that capture country specificities that are persistent over time. Stata MP 16.0 is used as the econometrics package.

## 4. Empirical results and findings

Table 3 reports the result of the analysis. For the purpose of completeness, in addition to the dynamic GMM (column 3), the estimation result of fixed effects static is also reported (column 2). The lagged dependent variable in the dynamic panel model (Lagged Gini), is statistically significant at 1 percent, implying that the GMM is a fitting estimator. Furthermore, the diagnostic statistics tests conducted indicate that the estimated model is well specified. The Sargan test statistics, as reported in Table 3, do not reject the null hypothesis implying that there is no problem of overidentification. Although the Arellano-Bond test for autocorrelation indicates the presence of the first-order autocorrelation in the disturbances of the first-difference equations at a 5% significance level, more importantly, it shows that AR (2) or the absence of the second-order serial correlation in disturbances is not rejected. Due to the lagged dependent term, the first-order serial correlation is expected and is not a problem.

In both estimations, as shown in the table, the two financial development index terms ( $FD$  and  $FD^2$ ) found to be significant at a 1% significant level, indicating the important role of financial development on income distribution. In addition, the non-monotonic effect of financial development on income distribution is confirmed, as opposed to the linear relationship hypothesis. The coefficient on the financial development index ( $FD$ ) is negative and the coefficient of its squared term ( $FD^2$ ) is positive, suggesting a U-shaped relationship. This implies that, up to a certain threshold, more finance is associated with decreasing inequality. But after this threshold, growth in the financial sector increases income inequality. This finding contradicts Batuo et al. (2010) and Kim and Lin (2011), but is in line with Tan and Law (2012) and Brei, Ferri, and Gambacorta (2018), though in different samples and using a different indicator for financial development. Different possible explanations can be provided for this phenomenon. One explanation that is widely accepted is the wage mechanism. An increase in the financial sector may benefit the individuals involved in the sector disproportionately compared to the rest. It seems that as the sector grows more, it pays its employees more than what workers with similar profiles get elsewhere, which exacerbates the inequality (OECD, 2015).

Table 3: Main estimation result

	FE	GMM
Lagged Gini		1.009*** (0.004)



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FD	-0.221** (0.078)	-0.054*** (0.013)
FD <sup>2</sup>	0.638*** (0.142)	0.138*** (0.027)
GDP p.c.	0.211** (0.056)	0.079*** (0.018)
GDP p.c. <sup>2</sup>	-0.014** (0.004)	-0.006*** (0.001)
Human Capital	-0.049** (0.015)	0.004 (0.002)
Inflation	0.000* (0.000)	0.000*** (0.000)
Unemployment	0.012** (0.004)	0.001 (0.001)
Govern. exp	-0.009*** (0.003)	0.006*** (0.001)
Trade Openness	-0.008 (0.005)	-0.005*** (0.001)
Constant	3.103*** (0.187)	-0.298*** (0.070)
R <sup>2</sup> (within)	0.114	
Sargan test ( <i>p-value</i> )		1.000
AB test, AR (1); <i>p-value</i>		0.007
AB test, AR (2); <i>p-value</i>		0.269

\*\*\*, \*\*, and \* denote statistical significance levels at 1, 5, and 10%. Standard errors are in parentheses. The Models are estimated with the system GMM.

As expected, the coefficients of both real GDP per capita (logarithm) and its square term are also found to be statistically significant. The results suggest the existence of an inverted-U-shaped relationship between GDP per capita and income inequality, confirming the Kuznets hypothesis.

The control variables in the model except for unemployment and human capital are statistically significant in determining the level of the income distribution. While an increase in government expenditure and inflation aggravates income inequality, a surge in trade openness, on the other hand, decreases the inequality. The finding on the share of government expenditure



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to GDP is somewhat unexpected. Even though public spending can serve as a tool to redistribute income among society, the findings indicate the opposite. The political environment may have a contribution to such associations. In many LI and LMICs, the political regimes are undemocratic and the institutional setups are very weak. Hence, most of the spending possibly will be unjustly captured by the top or middle-income classes. Besides, although the sign of the impact of inflation is positive, its magnitude is found to be very small. The result for the trade openness variable is anticipated given that trade liberalization should increase the relative demand and prices for unskilled labor and lead to a more equal distribution of wages in LI and LMICs which are typically characterized by low-skilled labor abundancy (Meschi & Vivarelli, 2009).

## 5. Conclusion

This study examines the role of financial development in influencing income inequality in 44 LMICs using a dataset that covers the period 1995- 2010. Although the subject has been gaining much-needed attention among researchers in recent years, the findings have been inconsistent. Furthermore, the number of studies that investigate the relationship by accounting for the depth, access, and efficiency of both financial institutions and financial markets is very limited, particularly in LI and LMICs. The ongoing effort to develop the financial sector has been a priority for quite some time in many of these countries. Therefore, understanding the effect of financial development on income distribution in their respective economies is vital.

The empirical analysis is implemented by the dynamic GMM estimation approach. The empirical results give evidence of a non-linear effect of financial development on income inequality. In particular, evidence of a U-shaped relationship between financial development and inequality is found. More recently such findings have been surfacing from other empirical studies. There are competing explanations for such a relationship. The possibility that too much financial development may lead to a disproportionate amount of benefit for the part of the society involved in the financial sector at the expense of the rest of society could be one reason. While this hypothesis has been tested and supported by empirical results in developed countries, such investigations have been hindered by the lack of data in LI and LMICs. However, with sufficient data, this can be an important hypothesis to test in future research.

To sum up, in recent years, more and more LI and LMICs have been implementing pro-finance policies, and the sector has shown increased development. The link between growth in finance and income distribution, therefore, can offer many more prospects for future research with invaluable merit.

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