

Meditation for Level of Institutional Quality to Combat Income Inequality through Financial Development

By

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Abstract

Institutional role to perpetuate the smooth and sustained functioning of economies has consensus in literature but the optimal level of institutional quality for prosperity is hardly discussed. On the other side, widening income inequality is attracting the attention of worldwide researchers now days. This paper is an attempt to explore the relation between income inequality and financial development varying with level of institutional quality. To this end, unbalanced panel data set for 124 countries covering the time span 1990-2015 is used and the instrumental variable threshold regression approach is applied to prove that a threshold level of institutional quality matters to reduce income inequality through financial development. Until then, financial development will be ineffective to overcome income inequality.

Key Words: Institutions, Income Inequality, Financial Development, Instrumental Variable Threshold Regression

1. Introduction

In recent decades, the increase in income inequality posed many challenges for researchers and policy makers across the globe. The income share of elites is increasing as compared with poor

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so widening income gap is a serious problem for modern economies. According to Global Wealth Report (2017) by Credit Suisse Research Institute, “More than 70 percent of the world’s adults own under \$10,000 in wealth. This 70.1 percent of the world holds only 3 percent of global wealth. The world’s wealthiest individuals, those owning over \$100,000 in assets, total only 8.6 percent of the global population but own 85.6 percent of global wealth. The world’s 10 richest billionaires, according to Forbes, own \$505 billion in combined wealth, a sum greater than the total goods and services most nations produce on an annual basis.” The rising income inequality has posed many questions on effectiveness of prevailing financial system of world which is unable to squeeze this gap between rich and poor.

There are two fundamental theories describing the relationship between financial development and income inequality; the “nonlinear hypothesis” of Greenwood & Jovanovic (1990) and the “linear hypothesis” by Galor & Zeira (1993) and Banerjee & Newman (1993). The linear hypothesis further explains the two ways of relationship between financial development and income inequality; one is the “inequality widening hypothesis” while second is the “inequality narrowing hypothesis”. The financial development benefits the rich only and excludes the poor people from development process due to weak institutional quality as stated by inequality widening hypothesis. The supporting argument is provided by Rajan and Zingales (2003) pointing out that rich are in capacity to offer collateral and repay the loan while poor are not in such condition to pay back their loans so income inequalities rise even a well developed financial system persist. Contrary, the inequality narrowing hypothesis claims that with growth of financial sector, the previously excluded poor people become part of this financial system and avail the opportunities to get loans so volume of income inequality falls down (Clarke et al.

2006; Beck et al. 2007; Mookerjee and Kalipioni 2010; Jalil and Feridun 2011; Hamori and Hashiguchi 2012).

Greenwood & Jovanovic (1990); Tan and Law (2012); Kim and Lin (2011) suggested a normal U shaped curve representing non linear relationship between income inequality and financial development. They explored that financial development with certain threshold level is necessary to reduce income inequality in a country; otherwise efficacy of financial development to overcome income inequality remains ineffective.

The earlier studies of topic reveal the existence of non linear relationship between income inequality and financial development then it is dire need to find out those factors responsible for such nonlinearities. Institutions play a vital role to determine the non linear relationship between financial development and income inequality according to perception of this study. It is argued that a threshold level of institutional quality is necessary for financial development to overcome the income inequality in a country. Chong and Gradstein (2007) argued that presence of weak institutional quality would not decrease income inequality with improvement in financial development due to judicial insecurity of poor, political interference and widespread corruption. Another study by Rajan and Zingales (2003) highlights that due to weak institutional quality; the fruit of financial development is captured by political representatives of the country and poor have to remain without improvement in their living standard. Additionally, inefficient institutions have impact to weak the capability of financial intermediaries for productive activities. On the other hand, efficient institutional structure may reduce income inequality with improvement of financial development allowing poor to invest in building their physical and human capital. It is evident that institutions make a distinction in the way of effectiveness of financial development to reduce income inequalities. This study is an attempt to provide

empirical evidence about the threshold level of institutions that may influence the role of financial development to overcome income inequality in a country. It is examined in this study that how relationship between income inequality and financial development vary along with changes in institutional quality. Finding the threshold level of institutional quality may have beneficial policy implications.

2. Literature Review

Kuznets (1955) developed the first model linking the economic growth and income inequality and found an inverted U shaped relationship between these variables. At earlier stages of economic development, income inequality persist at large scale and then starts to decline as the gains of growth extend to all segments of society. So income inequality is determined by level of economic growth. Numerous studies empirically tested the Kuznets theory and determined the U shaped relation between income inequality and economic growth (Barro (2000); Gine & Townsend (2004)). In the same way, Beck et al. (2009) linked the economic growth as banking deregulation with income inequality in United States and proved that banking sector decreased the income inequality while on the other side, Deininger & Squire (1998), Dollar & Kraay (2002) found no relationship between economic growth and income inequality.

Kumhof and Ranciere (2010) constructed a theoretical model to determine the effective role of financial crises and high credit growth on increasing income inequality. It is claimed that during the time periods of 1920 to 1929 and 1983 to 2008, income inequality increased with increase in credit growth and financial crises. Contrary, Bordo and Meissner (2012) are not willing to accept the hypothesis that rising inequality generally causes to a credit boom by using a bigger data set as compared with Kumhof and Ranciere (2010). They empirically proved that credit booms have not impact to reduce income inequality.

According to findings of Arcand et al. (2012), reducing financing constraints and efficient allocation of capital is expected to enhance the economic growth. While some empirical evidence proves the requirement of certain threshold level of financial development because excessively large financial sectors may involve in rent seeking activities hampering the economic growth of that country. These some financial firms distort the channels of efficient allocation of resources to needed segments of the economy.

Jauch and Watzka (2016) used un-balanced data set of 138 countries for developing and developed economies covering the time period of 1960 to 2008 to find the relation between income inequality and financial development by using different econometric specifications, measures of financial development and control variables. GINI coefficient and Credit to GDP is used as a proxy of income inequality and financial development respectively. The findings of the study reject the negative effect of financial development on income inequalities prevailing in these countries. It is proved that financial development is a source to increase income inequality in these countries.

Josifidis et al. (2017) empirically examined the impacts of changes in institutional quality on income inequalities in developed countries for the last two decades. It is argued that different interests of social groups are contributing to deteriorate income inequalities but their affects are not properly analyzed because distributional impacts of innovative disruptions are ignored. The study selected the sample of 21 OECD countries and found that effectiveness of elitization is higher than unionization on income redistribution while both are less pronounced in comparison with institutional change in these countries. It is highlighted that institutional inertia (slow changes in institutional environment) is partially responsible for high income inequalities and insufficient redistribution.

Madni (2018) investigated the effectiveness of income inequality, public spending and ethnic diversity to determine the institutional quality in Pakistan by applying ARDL approach. The findings of the study reveal that income inequality in country is weakening the institutional quality while ethnic diversity is also an important determinant for institutions. Moreover, public spending is contributing to improve the institutional quality but it has little share. It is suggested that public oriented spending is necessary to uplift the institutions of the country.

3. Methodology and Data

Following model is specified to test the relationship between income inequality and financial development:

$$\ln INEQ_i = \beta_0 + \beta_1 \ln FIND_i + \beta_2 \ln PCY_i + \beta_3 \ln EDUC_i + \beta_4 \ln INFL_i + \beta_5 \ln OPEN_i + \beta_6 \ln INTQ_i + \varepsilon_i \quad (1)$$

where *INEQ*, *FIND*, *PCY*, *EDUC*, *INFL*, *OPEN*, *INTQ* represent income inequality, financial development, per capita income, education, inflation rate, trade openness and institutional quality respectively. The control variables of the model are considered by theoretical and empirical basis. Banerjee and Newman (1993); Galor and Zeira (1993); Levine (2004); Arcand et al. (2012) proved that developed financial sector is a source to reduce income inequality. Kuznets (1955) explored the U shaped relationship between economic growth and income inequality; known as Kuznets curve. Huggett et al. (2006); Beck et al. (2007) determined the significance of educational attainment and trade openness to overcome income inequality. The richer people are in better position to hedge inflation due to easy approach to financial sector. It is well established fact that debtors remain beneficial from unexpected high inflation rate because of reduction in real debt (Hamori and Hashiguchi 2012; Beck et al. 2007). Dewey (1922); Brown (2005); Chong

and Gradstein (2007) proved that efficient institutional structure have a significant role to alleviate income inequality.

Income inequality is represented by GINI coefficient, financial development is represented by three indicators; private sector credit as percentage of GDP, number of commercial bank branches, stock market development is treated as stock market capitalization as percentage of GDP, education is represented by primary and secondary enrolment as percentage of population while institutional quality is measured from a constructed index of 21 indicators obtained from International Country Risk Guide through principal component analysis. The data sources are “Standardized World Income Inequality Database” (SWIID), “World Development Indicators” (WDI), “International Country Risk Guide” (ICRG).

Based on the threshold regression technique, equation (2) is derived to capture the affect of financial development on income inequality in presence of contingency effects.

$$INEQ_i = \begin{cases} \beta_0^1 + \beta_1^1 FIND_i + \beta_3^1 Xi + e_i, & INTQ \leq \phi \\ \beta_0^1 + \beta_1^2 FIND_i + \beta_2^2 Xi + e_i, & INTQ > \phi \end{cases} \quad (2)$$

In above equation, INTQ is the threshold variable representing institutional quality and utilized to split the sample into groups or regimes while vector of control variables is shown by X and ϕ is symbolized for unidentified threshold parameter. β_1^1 is for low regime countries and β_1^2 is for higher regime countries. According to hypothesis of the study, $\beta^1 = \beta^2$ so prescribed model is again linear and demotes to equation (1).

Null hypothesis of linearity $H_0: \beta_1 = \beta_2$ is tested for equation (2) in first step of estimation. The non standard inference problem emerges due to non identification of threshold parameter under the null hypothesis so Lagrange Multiplier or Wald test do not hold conventional chi-square limits as pointed out by Hansen (1996; 2000). Instead, super mum of the LM or Wald test statistics is calculated to implement the inferences for all possible values of ϕ . This limiting

distribution of nonstandard super mum statistics depends upon many nuisance parameters so inferences are implemented through a bootstrap model established by Hansen (1996). Caner and Hansen (2004) suggested a technique of instrumental variable threshold regression to deal with problems of endogeneity and threshold non linearity so equation (1) takes the following form;

$$INEQ_i = (\beta_1 FIND_i + \alpha_1 X_i) I(INTQ_i \leq \phi) + (\beta_2 FINDD_i + \alpha_2 X_i) I(INTQ > \phi) + \varepsilon_i \quad (3)$$

$$FIND_i = (\gamma_1 Z_i + \Theta_1 X_i) I(INTQ_i \leq \phi) + (\gamma_2 Y_i + \Theta_2 X_i) I(INTQ > \phi) + v_i \quad (4)$$

Where $I(\cdot)$ and Y represent indicator function and a vector of instrumental variables respectively, satisfying the order condition. To estimate the regression coefficients, a three step procedure is suggested by Caner and Hansen (2004). In first step, ordinary least square method is applied to get the fitted values of $FIND_i$ by regressing it on instrumental variables. Legal origins is considered as an instrumental variable proposed by La Porta et al (1999) as cross country differences linking the financial development and income inequality. The next step is substitution of predicted values of $FIND_i$ into equation (3). The third step is again applying of ordinary least square method to estimate the threshold parameter ϕ . Finally, on basis of threshold parameter, the whole sample is divided into two sub samples and generalized method of moments is applied to obtain the slope parameters. Then super mum Wald statistics is tested for existence of threshold level and derived the asymptotic distribution.

4. Empirical Findings

First of all, equation (2) is estimated and results are shown in table (1). Private sector credit, commercial bank branches and stock market development are considered as indicators of financial development. Bootstrap method is used to evaluate the p-value for significance of threshold estimate.

Table 1: Threshold Estimates of Institutional Quality

	Model 1 Private Sector Credit	Model 2 Commercial Bank Branches	Model 3 Stock Market Development
First Sample Split			
Threshold Estimate	2.914	2.642	2.891
Bootstrap p-value	0.003	0.001	0.008
LM test for no threshold	22.47	21.13	23.86
95% Confidence Interval	(2.713, 2.976)	(2.378, 2.721)	(2.719, 2.911)
Second Sample Split			
Bootstrap p-value	0.874	0.451	0.706
LM test for no threshold	6.21	5.79	6.88

Note: Null Hypothesis: No threshold effect

The p-values of model indicate that null hypothesis of no threshold effect cannot be accepted so presence of threshold effect can be found for such analysis. On the basis of estimated results, sample can be dividing into two regimes or groups. The threshold value of institution is 2.914 with 95% confidence interval of (2.713, 2.976) for model 1. It can be conclude that countries having institutional quality below than 2.914 are classified as low institutional quality group while countries above this value are considered as high institutional quality group.

After finding the presence of threshold effect for institutional quality in the model, how institutions affect the relationship between income inequality and financial development is a question to be answered. For this purpose, a model for each indicator of financial development is regressed and estimated results are reported in following tables (3), (4) and (5). In these models, institutional quality is a threshold variable while income inequality is a dependent variable.

Table 3: Regression Results Using OLS (Private Sector Credit as an Indicator of Financial Development)

	Linear Model	Threshold Model	
	OLS	Group 1 INTQ < 2.914	Group 2 INTQ > 2.914
Constant	3.568** (0.411)	2.785* (0.225)	4.746* (1.843)
FIND	0.022 (0.031)	-0.048 (0.039)	-0.573** (0.217)
PCY	0.019 (0.022)	0.062** (0.048)	0.072 (0.046)
EDUC	-1.128** (0.227)	-1.846** (0.357)	-0.571* (0.394)
INFL	0.111 (0.087)	0.215 (0.054)	0.428 (0.037)
OPEN	0.180 (1.481)	0.358 (1.841)	0.781 (1.998)
INTQ	-0.416** (0.089)	-0.573 (0.463)	-0.284** (0.082)
R ²	0.643	0.33	0.65
No. of Observations	153	117	36

Note: *, ** show significance at 1% and 5% respectively.

Table 3 presents the empirical findings showing the relationship between financial development and income inequality while private sector credit used as an indicator of financial development. The reported results point out that financial development has insignificant impact if institutional quality falls below the threshold level and it can reduce income inequality significantly when institutions are above the threshold level.

Table 4: Regression Results Using OLS (Commercial Bank Branches as an Indicator of Financial Development)

	Linear Model	Threshold Model	
	OLS	Group 1 INTQ < 2.642	Group 2 INTQ > 2.642
Constant	3.716* (0.426)	3.149* (0.481)	4.873* (1.621)
FIND	-0.162 (0.098)	-0.243 (0.136)	-0.268** (0.173)
PCY	0.174 (0.894)	0.270* (0.136)	0.384 (0.281)
EDUC	-0.887* (0.258)	-2.284* (0.353)	-0.473 (0.116)
INFL	0.006 (0.049)	0.087 (0.039)	0.264 (0.537)
OPEN	0.108 (1.83)	0.391 (1.43)	0.846 (2.11)
INTQ	-0.437*	-0.227	-0.842*

	(0.165)	(0.083)	(0.481)
R ²	0.55	0.59	0.63
No. of Observations	138	48	90

Note: *, ** show significance at 1% and 5% respectively.

The role of financial development measured as commercial bank branches has significant impact to overcome income inequality when institutional quality lies above the threshold level as reported in table 4. Financial development remains in vain to decrease income inequality if institutional quality is below than threshold level.

Table 5: Regression Results Using OLS (Stock Market Development as an Indicator of Financial Development)

	Linear Model	Threshold Model	
	OLS	Group 1 INTQ < 2.891	Group 2 INTQ > 2.891
Constant	0.038* (1.42)	0.211* (1.87)	0.186* (2.44)
FIND	-0.271 (0.169)	-0.283 (0.211)	-0.372** (0.263)
PCY	0.152 (0.087)	0.097** (0.032)	0.135 (0.887)
EDUC	-1.115** (0.315)	-1.542** (0.269)	-0.629 (0.347)
INFL	0.017 (0.022)	0.058 (0.041)	0.246 (0.153)

OPEN	0.469 (0.258)	0.158 (0.095)	0.361 (0.116)
INTQ	-0.481* (0.249)	-0.287 (0.117)	-0.816** (0.281)
R ²	0.59	0.55	0.53
No. of Observations	153	66	87

Note: *, ** show significance at 1% and 5% respectively.

Table 5 presents the empirical results of third indicator (stock market development) of financial development to alleviate the income inequality. The findings are similar with earlier indicators of financial development. Financial development has significant impact at 5% of significance to reduce income inequality if institutional quality is above the threshold level. In contrast, the impact of financial development is not effective below the threshold level of institutional quality.

The empirical outcomes of all three models presented in table 3, 4, 5 reveal that real GDP per capita is increasing income inequality significantly and positively when institutional quality is below the threshold level. It can be perceived that weak institutions are major factor to enhance income inequality even economic development persists in countries. If countries have efficient institutional structure then economic development has insignificant effect on income inequality.

Moreover, relationship between education and income inequality is consistent with economic theory. Education plays an important role to reduce income inequality if institutional quality lies down or above the threshold level and these findings are also consistent with Glaeser et al. (2004); explaining that educational attainment leads to improve the institutions of countries and these better institutions improve the economic growth. The estimated results indicate that inflation and trade openness have no role to decrease income inequality and these findings are in

line with Law et al (2014). The empirical findings point out that variable of institutional quality has crucial importance to decrease income inequality in all models of the study. Institutional quality has negative and significant affect on income inequality if it lies above the threshold level.

To deal with problems of endogeneity and threshold non linearity, instrumental variable threshold regression technique is applied and findings are reported in following table 6. The dependent variable of model is income inequality.

Table 6: Results of Instrumental Variable threshold Regression

	Threshold Model	
	Group 1 INTQ < 3.146	Group 2 INTQ > 3.146
Constant	2.716* (0.261)	5.816* (1.716)
FIND	-0.022 (0.072)	-0.581** (0.391)
PCY	0.184** (0.136)	-0.293** (0.184)
EDUC	-1.117* (0.216)	-2.371* (0.352)
INFL	0.171 (0.181)	0.546 (0.437)
OPEN	0.215 (0.216)	0.362 (0.264)

INTQ	-0.264 (0.217)	-0.648* (0.527)
R ²	0.42	0.60
No. of Observations	93	28

Note: *, ** show significance at 1% and 5% respectively.

Table 6 presents the findings of instrumental variable regression technique proposed by Caner and Hansen (2004). Legal origin is used as an instrumental variable. The value of super Wald test statistics is 65.553 (0.000) significant at 5% showing the significant presence of a threshold effect in relationship of income inequality and financial development, suggesting two separate groups of countries with respect to their prevailing institutional quality. It can be found out from empirical results that in group with high quality institutions, financial development has significant impact to decrease the income inequality. If institutional quality falls below the threshold level, financial development does not play a significant role to overcome the income level of a country. The findings are also consistent with OLS threshold regression technique.

5. Conclusions

Before thirty years, the role of institutions has not been stated for analysis of the economic performance of firms or countries. Today, the opposite seems to be true. It is believed now widely that role of institutions is important in defining and promoting economic prosperity and performance in developed as well as developing economies. This study is aimed to shed light upon some insights of literature about the linkages among institutional quality, income inequality and financial development for a sample of 153 countries covering the time period of 1990-2015. The findings of this study proved that threshold level of institutions have a vital role to reduce income inequality with support of financial development. The weak institutional structure is a

big hindrance in the way of alleviation of income inequality even flourishing the financial sector of countries because inefficient institutional structure distort the ability of financial intermediaries to distribute the resources among needy persons, firms and organizations for reduction of income inequality. This form of limited access social orders ruins the systematic functioning of economies. These findings reveal that effectiveness of financial development to overcome income inequality is conditional with prevailing level of institutional quality in a country. The strong and efficient institutional structure is a prime need for economies so that financial sector would be in position to reduce income inequality. It is also empirically proved that real GDP growth is a source to increase income inequality if institutional quality is below the threshold level. The fruit of economic growth could be ripening only to reduce income inequality if institutional quality exists above the threshold level. Furthermore, educational attainment is also a major factor to decrease income inequality because literate persons in a country demand high level of institutional quality that enhances the overall efficiency of the economy.

By concluding, income inequality cannot be reduced through financial development if role of institutions is negated. The embedded efficient institutional framework of a country will assure more income equality with better quality finance to economic agents. In terms of policy implications, the financial sector may be fruitful to overcome income inequality if policy makers bring the level of institutional quality up to threshold level of that country. Otherwise, any development in financial sector will not be able to deliver at grass root level and issue of income inequality might be bitterer in future.

Notes

Albania, Algeria, Angola, Argentina, Armenia, Azerbaijan, Australia, Austria, Bahamas, Bangladesh, Belarus, Belize, Belgium, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Cambodia, Cameroon, Canada, Cape Verde, Chile, China, Colombia, Congo Republic, Costa Rica, Cote d'Ivoire, Croatia, Cuba, Djibouti, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Fiji, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Guyana, Haiti, Honduras, Hungary, India, Indonesia, Iran, Iraq, Ireland, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyz Republic, Lebanon, Lesotho, Libya, Madagascar, Malawi, Malaysia, Maldives, Mali, Mauritania, Mauritius, Mexico, Morocco, Moldova, Mongolia, Morocco, Mozambique, Namibia, Netherlands, New Zealand, Niger, Nigeria, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Portugal, Romania, Russia, Samoa, Senegal, Sierra Leone, Singapore, South Africa, South Korea, Spain, Sri Lanka, Sudan, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tanzania, Thailand, Trinidad & Tobago, Tunisia, Turkey, Uganda, Ukraine, United Kingdom, United States, Uruguay, Venezuela, Vietnam, Yemen, Zambia.

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