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Impact of Institutional Quality, Energy Prices and Financial Development on Income Inequality: Evidence from Selected Asian Countries

Abstract

The present study analyzes the impact of financial sector development, institutional quality and energy prices on income inequality using panel data for 12 Asian developing countries for the time period 1990-2015. Fully Modified OLS has been applied to determine the long run relationship among the variables. The results of the study suggest that institutions affect income inequality positively, which means with the enhancement of institutions the inequality rises. Financial development and income distribution also have positive and significant relationship. The coefficient of energy prices is positively related to income inequality. The study concludes that the role of institutions in income inequality is highly important and the impact of financial development on poor class of the society is significant. This calls for appropriate measures to monitor the energy prices. The study suggests that the role of government in reducing income inequality is indispensable and government should invest in health, education and worker's training for improving the standard of living of the poor.

Introduction

Since the beginning of 21st century income inequality has become one of the most debated topic among researchers and policy makers. The discussion is mostly related to the factors responsible for income inequality and the policies to tackle it particularly in developing countries. The researchers have pointed out that equitable and fair distribution of income is necessary for achieving the rapid pace of economic development. In the absence of fair distribution of income the policies formulated and implemented in any country may be biased towards rich which distort incentive for work and investment. Furthermore, unequal distribution of income may lead to social problems like theft, robbery, corruption and terrorism. Therefore, there is a need to address this problem on priority basis and identify the factors responsible for income inequality so that appropriate policies can be formulated and implemented (for details, see Rehman et.al 2008)

Presently, financial development as an important factor of income inequality has received a lot of attention of the researchers. The theories like

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income inequality widening hypothesis and income inequality narrowing hypothesis have discussed the relationship between financial market and income inequality. The literature reveal that financial system can be deployed to make the income distribution pattern equitable. Furthermore, a developed financial system may reduce income inequality through overcoming the market imperfections of financial market which enhances the availability of credit and allowing poor to finance in structuring their human and physical capital (for details see Batuo et, al. 2010)

The relationship between income inequality and financial development can be viewed in the light of institutional quality. Institutions are regarded as one of the important factor of income inequality. Country with better institutions may be developed rapidly as compare to the country with poor institutions. Income inequality and poverty are influenced by institutional quality prevailing in the country. In the absence of good quality institutions there may be misallocation of resources which affect the poor adversely and it may increase the gap between the income of the poor and the rich. Furthermore, good governance, political stability, strong judiciary system and control over corruption not only promote income growth but also reduce income inequality as the poor can fight for their rights and rich find it difficult to influence the policies related to the welfare of poor. The relationship between energy prices and income inequality has been discussed vastly in the literature which explains that an increase in energy prices in international markets is translated into an increase in domestic inflation which exerts bad impact on the distribution of income.

The main objective of this study is to analyze the impact of institutional quality, financial development and energy prices on income distribution in selected Asian countries. The literature point out that most of the Asian developing countries suffer from income inequality which has been increasing over time and it has become a major cause of an increase in social problems which have achieved alarming situation. This calls for appropriate policies to tackle income inequality on priority basis. Furthermore, the global scenario points towards a situation in which income inequality has been increasing overtime which hurts the poor. There is concentration of wealth in the hands of wealthy people who influence the development policies and it has come up a major factor responsible for income inequality in these countries

II- Review of literature

Rehman et al. (2008) empirically investigate the Kuznets inverted U hypothesis. The data of 51 developed and developing countries was employed to test this relationship and the results confirm the existence of this hypothesis in economic growth and income inequality. Moreover, the negative relation between income inequality and financial development was observed while the Kuznets hypothesis between financial development and income inequality was not verified.

Easaw and Savoia (2009) analyze the impact of institutional development on income inequality in developing countries using cross country and panel data. The results indicate that increase in property rights widen income inequality while strong political system offset this effect to some extent. Batuo et al. (2010) empirically investigate the relationship between income inequality and financial

development for 22 African countries for the period 1990-2004 using dynamic panel estimation technique (GMM). The results of the study indicate the existence of negative relationship between the variables. The study concludes that higher financial development reduces income inequality and education plays an important role in making income distribution more equitable.

Zhuang et al. (2010) throw light on the impact of governance and institutions on economic growth and income inequality in Asian developing countries. The empirical findings suggest that government effectiveness, rule of law, control of corruption and improvement in law and order together with improvement in level of institutional quality increase the pace of economic development and lead to more equitable distribution of income.

Shahbaz and Islam (2011) point out a significant and negative relationship between income inequality and financial development in Pakistan using ARDL bound testing approach. The results show the existence of long run relationship between income inequality and financial development. The study concludes that there exist negative relationship between financial development and income inequality.

Law et al. (2014) examine the relationship between financial development and income inequality at different levels of institutional quality. Using threshold regression approach on the data of eighty one countries for the period 1985-2010, the study shows that after a certain level of institutional quality and financial development both tend to reduce income inequality.

Batabyal and Chowdhury (2015) point out the existence of negative relation between return on financial development and income inequality. Moreover, the results of the study indicate that an increase in corruption leads to an increase in income inequality suggesting positive relation between both the variables.

Adam and Klobodu (2016) analyze the relationship between financial development, control of corruption and income inequality. The results show the existence of positive relationship between financial sector and income distribution. The study concludes that developed financial sector causes inequality to rise while the corruption control has negative and significant impact on inequality. Furthermore, the interaction of financial development and control of corruption show a negative sign indicating that control on corruption and good governance may be helpful in reducing inequality.

Park and Shin (2017) empirically prove the U shaped relation between income inequality and financial development for Asian countries. The results of the study show that the improvement in financial sector helps in lowering the level of income inequality while after reaching a certain level the further improvement in financial sector worsen the situation. The study concludes that the countries with less developed financial sector reap the benefit of high growth rate and lower income inequality while for developed countries the improvement in financial sector does not contribute to both growth and equality.

III- Econometric methodology and model specification:

Data:

The present study uses the data for the period of 1990-2016 for 12 Asian countries. These countries are Bangladesh, Indonesia, Iran, India, Sri Lanka, Malaysia, Nepal, Pakistan, Philippines, Thailand, Turkey and Vietnam. The variables that are used in the study include institutional quality, energy prices, financial development, human capital, external debt, taxes and income inequality. Data for consumer price index, financial development, external debt and taxes have been taken from WDI (World Development Indicator). While data for human capital is taken from Penn World Table. Moreover, data for income inequality is taken from SWIID (Standardized world income inequality database), the data for oil prices has been taken from U.S. Energy Information Administration and data for institutional quality is taken from Institutional Quality Dataset by World Institutional Quality Ranking.

Model Specification:

The following model has been formulated to explore the impact of institutional quality, financial development and energy prices on income inequality.

$$LNQ_{it} = \alpha_0 + \alpha_1 INST_{it} + \alpha_2 EP_{it} + \alpha_3 FD_{it} + \alpha_4 FRND_{it} + \alpha_5 HK_{it} + \alpha_6 TX_{it} + \epsilon_{it}$$

Where:

LNQ = income inequality measured by Gini coefficient

INST= institutional quality index measured by taking economic, political and legal institutions

EP = energy prices proxied by ratio of oil prices to CPI

FD = financial development index constructed by using ratio of M2 TO GDP, ratio of domestic credit provided by banking sector to GDP and ratio of domestic credit to private sector to GDP.

FRND= foreign debt (constant) US dollars.

HK= human capital measured by human capital index

TX= taxes are measured by tax revenue as GDP percentage

ϵ_{it} =residual term

Description of Variables:

Income inequality:

Income inequality has been included as a dependent variable in this study. The most common measure of income inequality is Gini coefficient. The study uses net Gini data for the period 1990 – 2016 for 12 Asian countries taken from SWIID (standardized world income inequality dataset) (Solt, 2016).

Institutional quality:

Institutional quality has been incorporated as an independent variable to check its impact on income distribution. The study uses economic, political and legal institutions to measure institutional quality. The economic institutions

include financial freedom, business freedom, regulatory quality, freedom to own foreign currency bank accounts, credit market regulation, labour market regulations, investment restriction, capital control and economic environment. Political institutions include political environment, political rights, democracy, checks and balances, democratic accountability, corruption, bureaucratic quality, internal conflict and military in politics. Legal institutions include legal environment, property rights, civil liberties, judicial independence, impartial courts, law and order, religion in politics and rule of law. The data of institutional quality provide us simple averages of these three different aspects of institutions. Institutional Quality index is constructed through Principal Component Analysis (PCA) which has advantage over ICRG indicators as it covers a larger range of indicators and aspects of institutions. The expected relation of institutions with income inequality may be positive or negative depending upon the nature of circumstances.

Energy prices:

Due to unavailability of data of energy prices or electricity prices the study uses ratio of oil prices to CPI as a proxy of energy prices, keeping in view oil is an important source of energy. This proxy has been used by Nazarijadeh, et al. (2015). The expected relation between energy prices and income inequality may be positive.

Financial development:

The study includes financial development as an important independent variable. Financial development index is constructed using Principal Component Analysis (PCA). Financial development index is constructed through broad money (M2) as a percentage of GDP, ratio of domestic credit provided by banking sector to GDP and ratio of domestic credit to private sector to GDP. The main aim of financial development index instead of using a single indicator of financial development is to capture the overall influence of financial development on income inequality.

Human capital:

Human capital has been included as a control variable in the model. Human capital has been taken as skills and knowledge that is used to create income and economic value for individuals and community. The expected sign of human capital may be negative because human capital increases the standard of living of a common man which helps in narrowing the gap between the income of rich and poor.

External debt:

The external debt as an independent variable has been taken in constant US\$. The coefficient of external debt is expected to be positive because external debt is a source of inflation which hurts poor causing income inequality to rise.

Taxes:

Taxes play an important role in influencing income inequality as taxes can be used as a tool for reducing income inequality. The study uses tax revenue

as a percentage of GDP (Gross Domestic Product) which means if the tax revenue are spent on development and welfare of the poor it will be helpful in reducing income inequality.

IV- RESULTS AND INTERPRETATION

ADF Fisher unit root test has been applied to check the stationarity of variables. The results show that all the variables are non-stationary at level and stationary at first difference. This suggests to apply Panel cointegration technique for analyzing the relationship between the variables.

Panel Cointegration:

Cointegration among variables is used to determine whether there exists a long run association between the variables or not. Economists are mostly curious to know the long run relationship as compare to short run relationship between variables because long run relationship helps to predict the future values and helps in making appropriate decisions and formulation of better policies. The study uses Kao cointegration test for analysis purpose.

The Table 1 presents the results for Kao cointegration.

Table 1: Kao cointegration results

ADF		t-statistic		p-value	
		-1.974304		0.0242	
Residual variance		0.000783		---	
HAC variance		0.000825		---	
Variable	Coefficient	Std.Error	T-Statistic	P-Value	
RESID(-1)	-0.197034	0.033798	-5.829852	0.000	
D(RESID(-1))	0.143866	0.058125	2.475107	0.0139	
R-squared	0.108519	Mean dependent var		-6.68E-05	
Adjusted R-square	0.105402	S.D dependent var		0.030205	
SE of regression	0.028569	Akaike info criterion		-4.266101	
Sum squared resid	0.233422	Schwarz criterion		-4.240664	
Log likelihood	616.3185	Hannan-Quinn criter		-4.255907	
Durbin Watson stat	2.002141				

The careful examination of the results of Kao Cointegration Test brings up the existence of cointegration among the variables included in the model. After the confirmation of cointegration among the variables the next step is to estimate the values of long run coefficients. For this purpose Fully Modified OLS technique is used. The results are presented in Table 2.

Table 2: FMOLS Results

Variable	Coefficient	Std. Error	t-Statistic	P-value
INST	0.165889	0.045985	3.607480	0.0004*
EP	0.064299	0.031216	2.059790	0.0403**
FD	0.121512	0.020567	5.908148	0.0000*
HC	-0.055110	0.003508	-15.71149	0.0000*
FRND	-0.047626	0.010457	-4.554368	0.0000*
TX	-0.022584	0.008451	-2.672504	0.0080*

Notation * indicates significance at 1% level while ** indicates significance at 5 % level.

The results indicate that institutional quality has a positive and significant impact on income inequality. The value of t statistics for institutional quality is 3.60 which allows to reject null hypothesis and concludes that institutions have significant impact income inequality. The positive relationship suggests that when institutions become stronger and efficient the inequality tends to rise and it is due to the reason that developing countries are in initial and intermediate stages of economic development. The sign of energy prices is same as expected showing positive relationship between the variables so it can be concluded that an increase in energy prices causes inflation to rise which hurts poor and as a result income inequality increases.

Financial development has a significant impact on income distribution pattern. The positive relationship proposes that as the financial sector of an economy develops income inequality is increased. It may be due the reason that the poor are mostly unaware of financial liberalizations and does not have enough capital to invest and gain the benefits. While on the other hands the rich invests more and become richer which increases the gap of between the income of the poor and rich.

As expected there exists negative relationship between human capital and income inequality, external debt and income inequality, taxes and income inequality. The negative relationship between these variables is due to government spending on health, education, worker's training and development projects which provide an opportunity to the poor to increase their income and improve their standard of living.

V- CONCLUSION AND POLICY RECOMMENDATIONS

The main objective of an economy is to achieve rapid pace of economic development by utilizing its resources properly and implementing appropriate polices which may help in minimizing economic and social problems in the country. The present study is an attempt to identify the factors responsible for income inequality in selected Asian developing countries. The results of unit root test reveal that all the variables included in the model are I (1). For confirming the

existence of long run relationship between the variables Kao residual based cointegration test has been applied. After the confirmation of the existence of long run relationship FMOLS test is used to obtain the long run equilibrium values.

The results of the study show that there exists positive relationship between institutional quality and income inequality and also between energy prices and income inequality. This indicates that there is a need to have a control on energy prices for reducing income inequality. The relationship between financial development and income inequality has come up positive and significant which indicates that with the increase in financial development income inequality increases in developing countries because in most of the developing countries poor class fails to get benefit of financial development due to lack of knowledge and availability of capital for investment purposes. The relationship between human capital, external debt and taxes appear to be negative which indicates that an increase in external debt, government spending in human capital and an increase in tax revenue will lead to a reduction in income inequality. In short all the variable included in the model pose significant impact on income distribution in Asian developing countries. The study suggests that there is a need to introduce policies for reducing income inequality which may include awareness among the poor, monitor energy prices and invest in health, education and worker's training. Furthermore, economic, political and legal institutions need to be made strong and there is a need to improve governance so that efficiency of institutions can be enhanced which may be helpful in introducing unbiased policies.

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Appendix

Country list

Bangladesh, Indonesia, Iran, India, Sri Lanka, Malaysia, Nepal, Pakistan, Philippines, Thailand, Turkey and Vietnam