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The Determinants of Income Distribution, an Empirical Analysis of Developing Countries

SUMMARY: Income Distribution, which is a center of discussion in economic theory, has recently evolved from theory to application. The role of the government and institution in income distribution, especially in the developing countries, needs in-depth evaluation so that further policies can be constituted. This aspect of income distribution has often been empirically explored in developed countries but there is still gap present in developing countries. The present study is an attempt to fill the gap in research related to fiscal, institutional and macroeconomic determinants of income distribution in a sample of 50 developing countries through using Panel Estimation Technique covering a period from 1995 to 2015 with five years frequency. The study analyzes income distribution from three dimensions: Gini coefficient, Income share of the poorest 20% and Poverty gap. The study finds that while government current spending hinders equal distribution of income, social spending facilitates it. Control of corruption and improvement in bureaucratic quality has negative effects on the redistribution of income. Rising inflation appears to temporarily benefit the poorest income share while unemployment, per capita income and trade openness does the opposite.

KEYWORDS: Income Distribution, Determinants, Fiscal, Institutional, Macroeconomic, developing countries, Penal

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Income distribution is a wide concept that is interpreted in different terms throughout the studies in the field of economics. On factor level, income distribution is looked at what the land, labor, and capital have earned in the proportion of the national income. This dimension has a microeconomic view

that many classical economists such as *Adam Smith* have focused on but on a more macroeconomic point of view, the definition of income distribution changes. In this regards, the income distribution is looked at both the household and individual levels (Tinbergen, 1972).

The later approach is what this paper is centering on. When looking at how income is distributed across the entire society, it relates to how smoothly the income is divided

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amongst the population. A perfectly equal distribution of income means that each member of the society holds the same amount of income while perfectly unequal means that an individual possesses all the income while others have none. In between these extreme scenarios lies the income distribution that exists in most of the countries of the real world.

To understand how an income is divided amongst the population, different measures have been used to scientifically deduce the income distribution in an economy. These measures differ across the insights explored in relation to the income distribution of the population studied. Popular indications of distribution of income are indexes such as the Gini Coefficient, Theil Index, Hoover Index, 20:20 ratio, Palma ratio, wage share and others; out of these, the first two are the most popular. Other ways to determine how income is distributed in an economy is through looking at what income is earned by the lower or higher sections of a country. Similarly, poverty rates have also been used to understand the gap between the rich and the poor. Poverty statistics give an idea of how equal the economic opportunities are present in a country; especially since poverty level match the trends of income/wealth inequality of a country (Afonso et al, 2008; Yates, 2004). Similar measures exist which help understand specific sections of a society's income such as old age poverty, child poverty etc. Other measures such as the per capita income of the lowest two quintiles along with poverty rate specific to 50% of the population are all variations to study the income distribution in detail.

What is to be noticed here is that amongst the several measures of income distribution, the indexes used to understand how income is distributed in an economy are also used to measure income inequality. The concepts are often confused for one another; however,

income inequality is just another indicator of income distribution in an economy. In other words, the inequality statistics show just how fair is the income distribution of a country (Cowell, 2007). Thus, often, when we talk about determinants of income distribution, the determinants of inequality are also discussed. Similarly, since poverty and income quintiles are other measures of income distribution, factors that influence these indicators give us an idea of how income is distributed.

Determinants of income distribution are important to be studied as these are factors which influence the distribution of income of a country. Each region, country, and area has a different income composition which is due to its different socio-economic composition. Thus, examining the different determinants will help understand the differences amongst countries. These determinants have categories which include natural, macroeconomic, fiscal, institutional and others.

By determinants it is meant by factors which influence the distribution of income. Determinants of income distribution range from macroeconomic to government policies and many more. The most commonly explored indicators include those of macroeconomic in nature. However, when it comes to exploring how different indicators determine the income distribution of a country it is important to note that fiscal and institutional effectiveness matter the most especially in the case of developing countries.

Developing countries often ignored in research have been the victims of lack of data. While many works such as *Schuknecht and Tanzi* (2005), *Afonso et al* (2008), *Molina-Morales, Amate-Fortes and Guarnido-Rueda* (2013), and *Doerrenberg and Peichl* (2014) have explored fiscal, institutional, natural, and macroeconomic determinants of inequality; they have restricted their works to the OECD

countries. The developing countries, due to data restrictions have been left with a selected number of variables or studying variables in a country specific research on a household level such as *Mukaramah*, et al (2011), *Ostergaard* (2013), *Djhon*, *Hasid* and *Setyadi* (2016), and *Zaman* and *Shah* (2016).

The study is aware of the data restrictions and the research gap present in terms of developing countries. Keeping all this in mind, the aim of the study has been established to study income distribution through its different indicators in developing countries. The developing countries have different economic, fiscal, and institutional mechanisms than developed countries do. Several studies have not focused on Income Distribution Determinants and Public Spending Efficiency in the Developing countries. The present study aims to contribute to the gap present in assessing the government's role and efficiency towards Income Distribution across the Developing Countries. The study looks at Developing Countries from different Regions across different time periods that has not been explored before.

The study will aim to seek answers to these questions through using a panel data of fifty developing countries across the 5 yearly time periods of 1995, 2000, 2005, 2010, 2015, using the Penal Estimation technique. The paper is divided into the following sections: section 2 contains the literature review, section 3 discusses the methodology, section 4 presents the regression results while the final section which is 5, concludes this paper.

LITERATURE REVIEW

The literature mentioned, solely focuses on the developing countries due to technical limitations. Studies in developing countries, usually comprises of individual country

analyses that focus on household indicators as determinants of income distribution. The most relevant work on income distribution determinants in the developing countries is mentioned.

Helene (2010) drove the Lorenz function using linear proportions to represent the income distribution in Brazil. Calculating the curves using 2003 to 2007 data, the least squares method to find that the mode of income distribution was found to negatively relate to the Gini coefficient and their Lorenz curve depicted reliable results for the Brazilian economy. *Ali* (2014) saw the effects of income inequality and inflation on the economic growth, centering his research in Pakistan, using the Johansen co-integration technique, along with analyzing the models in the short-run and long-run using vector error correction models for Pakistan during 1972 to 2007. They found growth and inequality to be negatively related while Foreign Direct Investment (FDI), inflation, value addition in manufacturing and remittances were found to facilitate economic growth.

Okatch (2013) explored household wage, unearned income, business profits, private transfers, and income tax in Botswana for 1992/1993 and 2002/2003. He explored how the household characteristics, decomposing the HIES data using regression-based inequality decomposition technique. He found that secondary school education, training, VAT, number of paid employees and number of children increase inequality. Primary education, age, social safety nets and the number of cattle owned tend to equalize income. *Mukaramah*, et al (2011) explored primary inputs such as subsidies, indirect taxes, surplus and wage income along with public spending on different sectors on the household income of different Socio-Economic groups in Malaysia. They found rural and agricultural development expenditures have been found

to reduce inequality across ethnic groups and areas (urban and rural).

Perara and Lee (2013) used a sample of developing countries from 1985 to 2009. They used GMM (Generalized Method of Moments) to see how the public-sector performances can influence inequality and poverty. In terms of poverty levels, they found that law and order and government stability improvements tend to decrease poverty. Similarly, it was deduced that enhancement in democratic accountability, corruption, and bureaucratic quality led to rising income inequality. Odedokun and Round (2004) examined a sample of 35 African countries from 1964 to 2004 through OLS (Ordinary Least Squares) to see different outcomes of regional factors, economic development attained, size of government budget, phase of the economic cycle, and other factors on the Gini coefficient. It was discovered that inequality of high levels does affect growth. The size of government budget (% of GDP) tends to increase inequality, while the subsidies do the opposite. Increased participation of the work force in Agricultural production had increased inequality.

THEORETICAL FRAMEWORK AND MODEL SPECIFICATION

The paper follows Afonso et al (2008)'s conceptual outline used for research on the OECD countries. The paper uses the three most popular measures of income distribution from Afonso et al (2008)'s research, due to data limitations in the developing countries. (See Figure 1)

Following the model and variables used by Afonso et al (2008), Perara and Lee (2013) and Martines-Vazquez, et al (2012); the study has incorporated fiscal, measures of institutional effectiveness and macroeconomic variables (also

used as control variables) to see their effects on three measures of income distribution.

$$ID = \alpha_i + \beta_1 GSP_{it} + \beta_2 SSP_{it} + \beta_3 Tax_{it} + \beta_4 PCR_{it} + \beta_5 GEF_{it} + \beta_6 CV_{it} + u_{it} \dots \quad (1)$$

Where,

ID = Income Distribution using three indicators: GINI Coefficient (Model 1), LI = Income of the lowest quintile (Model 2) and *Pvgap* = Poverty Gap (Model 3)

Fiscal Indicators as a percentage of GDP

GSP = Government Final Consumption Expenditure

SSP = Social spending

Tax = Taxation Revenue

Institutional Effectiveness

PCR = Primary Completion Rates

GEF = Government Effectiveness Index

CC = Corruption Control Index

Macroeconomic/Control Variables (CV)

TO = Trade Openness

GDPC = Gross Domestic Product per Capita

UI = Unemployment Index

CPI = Consumer Price Index

Variables in the Model

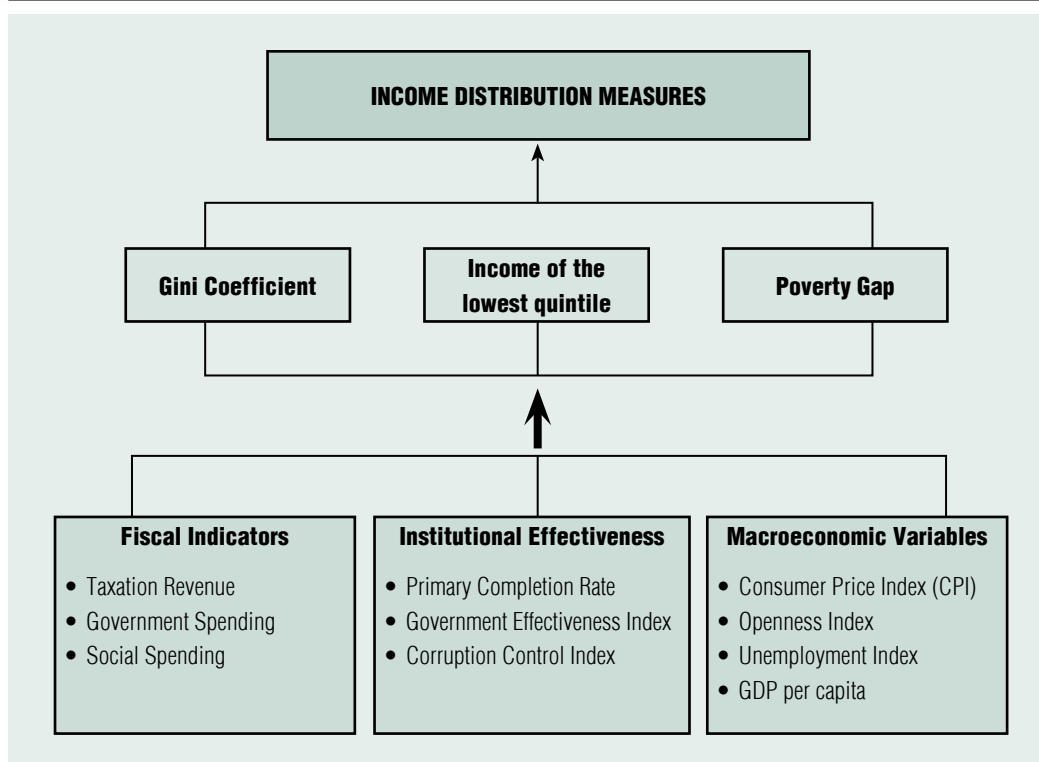
A. Dependent variables

Out of the several measures available the measures selected bear the qualities of consistency across the sample of countries taken, availability for the countries and time-period specified, and accuracy in terms of data interpretation. Three measures taken to represent Income Distribution are:

GINI Coefficient

It is a statistical measure which is used to represent distribution of wealth or income of

THE THEORETICAL FRAMEWORK FOR ESTIMATING THE DETERMINANTS OF INCOME DISTRIBUTION



Source: Author's own illustration

a population in study. It ranges from 0 to 100, 0 indicates perfect equality while 100 shows perfect inequality.

Income of the lowest quintile

As per definition of the World Bank (2015), it is the percentage of income owned by the lowest quintile which is the lowest 20% of the population.

Poverty Gap

It is the population deficit or shortfall from the Poverty line, where the non-poor would be counted as being classified as having no shortfall. The Poverty Gap is taken at \$1.25 (PPP) a day and is in percentages.

B. Independent variables

Fiscal Indicators as a percentage of GDP

GOVERNMENT FINAL CONSUMPTION EXPENDITURE. All current government spending used for goods and services purchases which includes employees' salaries, national defense etc. It however does not include military expenses which are a part of the capital formation of the government (World Bank, 2018).

SOCIAL EXPENDITURE. Governments and public organizations provide transfers in the form of cash or in-kind on a social basis which is known as social spending.

TAXATION REVENUE. Tax revenue accounts for all obligatory payments to the government gathered for the interest of the public. These do

not include penalties, fines, and contributions into the social security.

Institutional Effectiveness

PRIMARY COMPLETION RATES. The indicator shows the enrollments into the primary education’s previous grade, excluding the repeaters.

GOVERNMENT EFFECTIVENESS INDEX. The index shows the Bureaucratic quality of a country and ranges from 0 to 1, where 0 is the least effective and 1 is the most.

CORRUPTION CONTROL INDEX. It measures how much corruption is controlled in a country. Score 1 shows maximum control over corruption and 0 being the least.

Macroeconomic/Control Variables

CONSUMER PRICE INDEX. The CPI has a 2010 base year. This index shows the changes in cost an average consumer must pay for a basket of goods and services.

TRADE OPENNESS INDEX. Trade Openness in practice means trade (exports + imports) as a percentage of GDP.

UNEMPLOYMENT INDEX. This statistic is defined in both theory and practice as the percentage of the labor force that are unemployment involuntarily.

GDP PER CAPITA. GDP per capita has been taken at PPP (purchasing power parity) and at International dollars (\$). Through using the PPP rates, the GDP per capita is converted into international dollars (constructed on 2011 ICP round).

METHODOLOGY

Econometric Methodology

Statistical Software STATA version 12.0 special edition has been used to compute the results. The Panel Data Analysis incorporated

is under the inspiration of several studies using similar analysis.

The study has either pursued the Fixed or Random effects model; the assumptions of these models differ. The Fixed effects model assumes that there are non-random quantities or fixed parameters present in the model:

$$Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it} \dots \tag{2}$$

While the Random effects model assumes that considers the parameters to be random:

$$Y_{it} = \beta_1 X_{it} + \alpha + u_{it} + \varepsilon_{it} \dots \tag{3}$$

Where

α_i ($i=1 \dots n$) is the unknown intercept for each entity (n entity-specific intercepts)

Y_{it} is the dependent variable (DV) where i = entity and t = time

X_{it} represents one independent variable (IV)

β_1 is the coefficient for that IV

u_{it} is the between-entity error

ε_{it} is the within-entity error

Random Effects Model specifies that the unique characteristics do not correlate with the Independent variables (individually). On the other hand, Fixed Effects Model assumes that certain unique characteristics exist of the individual observations that do not change over the time progression.

The Hausman Specification Test (1978) is used to determine whether Fixed or Random Effects model will be used. The test is also known as the Durbin-Wu-Hausman Test, it helps specify whether Random or Fixed Effects would fit the three models taken in the study.

To confirm that the Random Effects fits the model after Hausman Test has specified it, Breusch-Pagan Lagrange multiplier (LM) has been executed to support the selection. Where Random Effect fits such as in Model 1

and 2, the test validates the selection. For the Fixed Effects Model selection as in Model 3, the Wald Tests confirms its use.

Data Sources

A sample of 50 countries that are classified by the World Bank as low, lower-middle and upper-income developing countries have been taken in this study. Countries are taken from different regions (detailed list of countries with respect to their regions presented in the *Table A1 in the Appendix*). The time periods taken are 1995, 2000, 2005, 2010, and 2015 for the consistency of comparison across these periods and the availability of data.

The sample of developing countries under consideration, itself, has data availability problems. This problem has been resolved through referring to several sources for the data. Furthermore, data for variables that have a rigid nature over a period of 3 to 4 years, have been taken under the years considered for the study which are: 1995, 2000, 2005, 2010, 2015. For example, for Gini coefficient being only available for Ghana for 1994, it has been used as an indicator for the 1995 regression. This has been done for some countries and variables where data was not available. Few missing observations have been filled in with employing interpolation and extrapolation statistical techniques.

GINI Coefficient, Poverty Gap and the Income of the lowest quintile are taken from World Bank Development Indicators and World Income Inequality Database. All fiscal and macroeconomic indicators have been taken from the World Bank Indicators, the gaps have been filled through IMF and the International Labor Organization (ILO) and the United Nations sources through the database at Knoema. The Indexes measuring Government Effectiveness, Regulatory

Quality and Corruption Control are taken from International Country Risk Guide. Missing data has been extrapolated for countries: Madagascar, Tanzania, Morocco, Guinea, Honduras, Nicaragua, Iran, Jamaica, Panama, and Dominican Republic of social spending of 2015. Values for Ethiopia, Senegal, Bangladesh, Tunisia, Kenya (2010 and 2015), Zambia, Morocco, Malaysia, Azerbaijan, Namibia, Jamaica (2010 and 2015), and Venezuela of Poverty gap have been extrapolated for 2015; for Bangladesh, Kenya, Zambia, Morocco, Malaysia, Azerbaijan, Namibia, and Jamaica of 2015 for income of the lowest 20%.

EMPIRICAL RESULTS

The Panel data taken in this analysis is balanced in nature which means that all units of cross-section have equal number of time series observations. Whether Random or Fixed Effects fits the Models taken, each model is individually tested. After performing the Hausman Test, Models 1 and 2 (Gini Coefficient and Income of the lowest 20%) fitted the Random Effects specification while the Model 3 (Poverty Gap) fitted the Fixed Effects.

Breusch and Pagan Lagrangian Multiplier Test seconds the use of the Random Effects for the first two models. Wald tests confirm the use of Fixed Effects for the third model. For the Poverty Gap model, fixed effects make sense because in case of poverty many other factors influence the independent variables. In other words, in case of poverty, primary completion rates (for example) have individual errors influence such as ability, family background etc. Random Effects for Gini Coefficient and Income of the lowest 20% indicates that this correlation with individual error terms does not exist.

Model 1: Gini Coefficient as a dependent variable

After confirmation of the use of Random Effects, heteroskedasticity and autocorrelation have been found in the model. The Pesaran's test of cross-sectional independence shows no dependence. The regression requires corrections for heteroskedasticity and autocorrelation and the results quoted are the ones after their correction through using clustered sandwich estimators. The model appears to be overall significant (probability of Chi Square is zero) as shown in table 1. The model appears to be correct and all coefficients are not equal to zero. For fiscal indicators, government spending tends to increase income inequality, but this effect is not significant. Since here the government expenditure taken are the current fiscal expenditures such as wages, salaries, administrative maintenance, etc. Though these do contribute to maintaining social services such as education and health; they are not targeted specifically at the poor. An efficient maintenance could facilitate the poor but in the case of the sample of developing countries taken such effect is not being seen. In the case of social spending, there is a significant impact of -0.547. It means that as social spending rises the inequality will fall because this spending is aimed at aiding the poor. This is like the findings of *Nikoloski* (2007). This significant relationship stresses the importance of targeted government spending in the social sector, especially in the developing countries.

Taxation Revenue's effects greatly depend on the type of taxation system employed. A progressive taxation system has the tax rates charged (%) to rise as the income rises. The opposite is for Regressive taxation system, where the tax rates are decrease as income rises. The negative impact of taxation revenue

on inequality can show presence of a regressive taxation system in these developing countries. However, this influence is insignificant and could be so due to tax evasions which are common in developing countries. Most developing countries do not have proper administrative and legislative means to keep check and balance of income shifting and tax evasion (Fuest and Riedel, 2010). As a result, the taxation system does not act as an effective income redistribution tool in developing countries.

In terms of Institutional Effectiveness, government effectiveness and corruption control have significant impacts on income inequality, but primary completion rates do not. What is understandable is that primary completion rates are too insignificant to impact inequality; achieving higher education might reduce the inequality in these developing countries but data restraints us for exploring this aspect.

Government Effectiveness and Corruption Control both appear to increase income inequality. This result, though perplexing, is not something new. *Perara and Lee* (2013) found similar results on their sample of east and south Asian developing countries. Government Effectiveness in the form of bureaucratic quality might not be centered on income redistribution and thus, ends up harming it then benefitting it.

The PRS group (2012) defines its data of corruption as being the 'potential one'. This means it is corruption in the form of reserving jobs, favoritism, nepotism, funding of party secretly, politics and business having close ties etc. As per this definition, when such corruption is controlled it ends up increasing inequality. Even though this type of corruption destroys the economy and the political system, it is common in the developing countries. Perhaps the developing countries' system this way keeps inequality at

Table 1

REGRESSION RESULTS FOR RANDOM EFFECTS AND FIXED EFFECTS OF GINI COEFFICIENT AS A DEPENDENT VARIABLE^x

	Random Effects	Fixed Effects
Government Spending	0.22 (1.59)	0.133 (0.94)
Social Spending	-0.547* (-2.84)	-0.538* (-2.70)
Tax Revenue	-0.020 (-0.22)	0.0015 (0.01)
Primary Completion Rates	0.030 (0.92)	0.035 (1.22)
Govt. Effectiveness Index	5.40** (2.35)	4.861 (1.60)
Corruption Control Index	5.81** (2.13)	5.251** (2.00)
Unemployment Ratio	0.465* (3.18)	0.448* (2.75)
GDP per capita	0.000015 (0.15)	-0.0000158 (-0.14)
CPI	-0.0003 (-0.06)	0.0000492 (0.01)
Trade Openness	-0.0023 (-0.09)	-0.0088 (-0.39)
	Wald chi² (10) = 47.35 Prob>chi² = 0.000	F= 3.19 Prob>F= 0.008

^x The results presented for fixed effects have not been post-tested or corrected as the random effects results are

Note: *, ** and *** represent significance at 1%, 5% and 10% level, respectively. The z values for the random effects and the t values for the fixed effects are given in brackets for each coefficient.

Source: Author's own estimations

low levels, since this gives way to the black market. *Bonnet* and *Venketesh* (2016) report that black or informal markets are benefited by the poor as they have more variety to sell and cheaper options to buy. They also provide incomes for skills that will not be employed in the formal market. Thus, it could be

that the existence of black market through this corruption supports the income of the poor and thus reduced income inequality in developing countries.

In terms of control variables, all do not seem to have significant impacts on income inequality except for unemployment which

seems to increase income inequality as per expectations. In developing countries, a short-term unemployment might have significant effects. As the debt trap increases, not only does poverty rise but the gap between the rich and poor tends to rise as well. This because those unemployed persist to lose more as compared to the ones already employed (Nickell, 1990).

Model 2: Income share of the lowest 20% as a dependent variable

The diagnostic tests revealed the presence of autocorrelation and cross-sectional dependence. Following the advice of *Hoechle* (2007), the model has been run using the Driscoll-Kraay standard errors through the Pooled OLS method. The results are given *in table 2*.

This measure is to see how the lowest 20% income holders are affected. In terms of Fiscal Indicators, government spending appears to negatively affect the poorest income group and it could be because it does not aim directly at facilitating this group but instead is focused on maintenance of its departments. Similarly, the significant positive impact of social spending supports the findings in the previous model. It means that developing countries do have such social spending that is targeted towards facilitating the income generation of the poorest. Rise in taxation revenue appears to benefit this group which might suggest a more progressive taxation system. However, it is not significant in case of reducing income inequality but does seem to benefit the incomes of the poorest group. It could be because most of the tax revenue is allocated towards providing relief to the poorest income group in the developing countries.

Institutional effectiveness shows similar findings to inequality. Primary education does not have any effect on the income earnings of the poor. Apart from the reasons already discussed, another reason could be that the lower classes, which usually have blue collar jobs, do not require the ability to read and write to earn a better living. Government Effectiveness and corruption control both negatively and significantly lower the poor people's income in the developing countries. Since, corruption control tends to reduce the income of the poorest; significantly, the black-market income support theory might be applicable. It thus, supports the notion that when black market is controlled the income of the poorest group in the developing countries suffers. Similarly, efficient bureaucracy might support the rich more than the poor and thus its improvement reduces the poorest section's income.

All control variables significantly impact the lowest income group. Firstly, trade openness also impacts income of the lowest negatively. To understand this, it must be understood that trade openness causes outsourcing. Outsourcing of production from developed to developing countries did cause the low skill workers to suffer in the developed countries but would benefit the developing countries. This is because resource production is mostly undertaken by highly educated/ skilled and wealthier workers in the developing country (Feenstra and Hanson, 2003; Feenstra, 2007). Similarly, capital goods imports and FDI has exacerbated the effect as they require workers that are highly skilled (Hanson and Harrison, 1999).

Secondly, according to the Kuznets curve economic growth might raise inequality in the developing countries that have just witnessed industrialization. Furthering the classical theories behind economic growth's impact on income inequality, urbanization in its early stages can raise inequality but it then

Table 2

REGRESSION RESULTS FOR RANDOM AND FIXED EFFECTS OF INCOME OF THE LOWEST 20% AS A DEPENDENT VARIABLE^x

Variables	Random Effects	Fixed Effects
Government Spending	-0.115* (-5.31)	-0.044 (-1.41)
Social Spending	0.098* (7.29)	0.954** (2.18)
Tax Revenue	0.061* (6.49)	-0.009 (-0.39)
Primary Completion Rates	0.0023 (0.32)	-0.0018 (-0.29)
Government Effectiveness Index	-0.796* (-5.17)	-0.488 (-0.73)
Corruption Control Index	-3.08* (-4.32)	-1.034** (-1.79)
Unemployment Ratio	-0.0795* (-11.73)	-0.064** (-1.80)
GDP per capita	-0.000078** (-2.32)	-0.0000151 (-0.61)
CPI	0.00102** (2.12)	0.00214** (1.85)
Trade Openness	-0.0054** (-2.55)	0.0019 (0.39)
	R squared= 0.1469 Prob>F = 0.00	F= 2.68 Prob>F = 0.0043

^x The results presented for fixed effects have not been post-tested or corrected as the random effects results are

Note: *, ** and *** represent significance at 1%, 5% and 10% level, respectively. The z values for the random effects and the t values for the fixed effects are given in brackets for each coefficient.

Source: Author's own estimations

reduces it as urbanization progresses. This is because urbanization raises unemployment in the condition when the supply of workers exceeds the demand of workers in the urban sector (Harris and Todaro, 1976). Thus, low-urbanized countries, which are mostly the

developing and less developed countries, are likely to experience rise in unemployment and income inequality. In other words, the GDP per capita and unemployment's negative effects on the poorest section's income supports these theories.

Even though inflation tends to hurt the low-income groups, the results show the opposite. It does support the idea that a beneficial black market exists in the developing countries. High prices may cause people to switch to the black market, raising profits for the sellers and saving money for the buyers (Bonnet and Venketesh, 2016).

Model 3: Poverty Gap as a dependent variable

The poverty gap gives an idea of how much (in percentages) is the population's lack of income from the poverty line. The model didn't show any cross dependence as the income of the lowest 20% did but did have heteroskedasticity and autocorrelation present. The Fixed Effects was run with Driscoll-Kraay standard errors and the results are quoted as such under *table 3*.

The model is found to be significant at $p = 0.00$. The fiscal indicators show results that support the results of the first two models. Government Spending tends to increase poverty and thus confirms that the general government consumption takes resources away from poverty alleviation goals. Social spending and taxation revenue both seem to facilitate reduction of poverty. This provides another evidence of efficient social spending targeting and the taxation system being progressive.

Institutional indicators again show no influence of primary completion rates. What is new is that corruption control reduces poverty, but this effect is insignificant. Apparently, the depth of poverty can be combated by reducing corruption, but it will not be significant enough. Government Effectiveness increasing poverty again echoes the results found by the first two models. The bureaucratic quality improvements do not

seem to facilitate the poor in the developing countries.

The control variables do not have a significant effect on the poverty gap, except for CPI. Inflation is found to significantly decrease the income shortfall from the poverty line. These are the similar findings to the income of the lowest 20%. The study finds solace in the fact that there is still support in favor of a black-market presence.

CONCLUSIONS AND POLICY IMPLICATIONS

This paper aimed at empirically examining how fiscal indicators and institutional effectiveness affect the three indicators of income distribution. Gini coefficient is taken as a dependent variable in model 1 to assess income inequality. To understand the depth of income distribution dimensions, the lowest class is examined. The study aims at focusing on the poor rather than the rich. This is to be able to devise policies that helps uplift this deprived section to reduce inequality.

The results indicate that government final consumption expenditures which are current expenditures tend to affect inequality, income of the lowest class and poverty gap adversely. Even though its effect on income inequality is insignificant, it indicates that the government spending tends to take the resources away from social uplifting expenditures. It is important to be spending on social protection as the results indicate that such targeted spending significantly reduces inequality and helps in uplifting the lowest income groups. Taxation, similarly, aids in poverty reduction and improving the incomes of the poorest. Even though, it is insignificantly impacting income inequality, this impact might show presence of tax relief to the poor, which is recommended.

Table 3

REGRESSION RESULTS FOR RANDOM AND FIXED EFFECTS OF POVERTY GAP AS A DEPENDENT VARIABLE^a

Variables	Random Effects	Fixed Effects
Government Spending	0.421 (3.10)*	0.286 (4.54)*
Social Spending	-0.467 (-3.13)*	-0.517 (-12.18)*
Tax Revenue	-0.228 (-2.27)**	-0.270 (-9.08)*
Primary Completion Rates	-0.077 (-2.72)*	-0.016 (-0.77)
Government Effectiveness Index	-2.062 (-0.69)	4.121 (2.11)*
Corruption Control Index	-1.393 (-0.50)	-1.432 (-1.38)
Unemployment Ratio	-0.147 (-1.24)	-0.0365 (-0.50)
GDP per capita	-0.00017 (-1.65)**	-0.000037 (0.94)
CPI	-0.0099 (-1.77)**	-0.0179 (-5.32)*
Trade Openness	-0.016 (-0.89)	-0.0081 (-0.65)
	Wald chi²= 86.72 Prob>chi² = 0.000	R squared= 0.2142 Prob>F = 0.00

^a The results presented for fixed effects have not been post-tested or corrected as the random effects results are

Note: *, ** and *** represent significance at 1%, 5% and 10% level, respectively. The z values for the random effects and the t values for the fixed effects are given in brackets for each coefficient.

Source: Author's own estimations

The study further finds that primary completion in developing countries has no impact on inequality or benefitting the poor groups. Perhaps higher education could help in the achievement of such goals, but data unavailability restricts us from exploring that

aspect. Government effectiveness in terms of improvement on bureaucratic quality adversely affects all three income distribution variables. This is similar to findings by other studies in developing countries. Since, the government spending tends to hinder progress

in poverty and inequality; it makes sense that improvement in bureaucratic quality in such government institutions will have the same effect.

Corruption control seems to adversely affect both income of the lowest 20% and the Gini coefficient. However, it affects poverty alleviation positively but is not significant. According to the Corruption definition by the PRS group, the corruption indicator has taken will likely result in the creation of black markets which thrive in the developing world. It may indicate that such black markets help generate incomes of the poor and helps reduce income inequalities. The significant positive influence of inflation on reducing poverty depth and raising incomes of the lowest 20%, further supports the existence of a black market. Black market thrives when inflation takes place because buyers look for cheaper options on the black market and sellers earn much more.

Amongst the macroeconomic indicators taken as control variables, unemployment significantly impacts income inequality and the lowest income groups adversely. Tackling unemployment, thus, should be the aim of the governments in developing countries. Since, unemployment is such a significant impacting

factor, it can explain why government supports in form of social spending greatly helps reduce income inequality and raise the incomes of those in poverty. GDP per capita (as a measure of economic growth) and trade openness in the developing countries affects the income of the lowest quintile as expected. The poor, thus, do not appear to take part in the development process and thus do not benefit from it.

In the light of such findings, this study suggests the governments of the developing countries to plan towards providing more social assistance to uplift the poor and reduce income inequality. This is suggested because if public finances are directed towards another direction then improvements in effectiveness of the government and control of corruption will not help in uplifting the poor. The government spending needs to be directed towards redistribution, specifically, to reduce income inequalities in the developing countries.

However, what is to be noted that the data available on the indicators taken in this research are estimates. This is because of lack of surveys that take place in the developing countries, especially for poverty indicators. The results might not depict the ground reality but an estimate of the real situation.

APPENDIX

Table A1

LIST OF COUNTRIES TAKEN IN THE STUDY FROM EACH REGION

Region	Countries
Central and South Asia	Armenia
	Bangladesh
	India
	Pakistan
	Sri Lanka

Region	Countries
East Asia and Pacific	Mongolia
	China
	Thailand
	Philippines
	Indonesia
	Malaysia
Central Asia and Europe	Azerbaijan
	Kazakhstan
	Turkey
Sub-Saharan Africa	Burkina Faso
	Ethiopia
	Madagascar
	Senegal
	Tanzania
	Uganda
	Cameroon
	Kenya
	Zambia
	Namibia
South Africa	
Middle-East and North Africa	Tunisia
	Morocco
	Iran
Latin America and Caribbean	Bolivia
	El Salvador
	Guatemala
	Guinea
	Honduras
	Nicaragua
	Brazil
	Colombia
	Costa Rica
	Dominican Republic
	Jamaica
	Panama
	Peru
Paraguay	

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