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The determinants of inclusive growth in Pakistan: An Empirical Analysis

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Abstract
This study aims to answer the question that "urban population has a detrimental impact on inclusive growth?" (GINI coefficient is used as a proxy to measure inequality). For this purpose, Autoregressive Distributed Lag model (ARDL) is used to observe the cointegration among all variables of the model. The vector error correction technique has used for short run dynamics. The empirical result confirms the presence of cointegration among the urban population and GINI coefficient of the model. These results reveal that urban population has a deep-rooted impact on the inclusive growth of the economy. Hence, if Pakistan desired to achieve inclusive growth for the economy, then Pakistan has to make urban population strong and productive.

Keywords: urban population, GINI, secondary education, inflation, foreign direct investment
JEL Codes: F3, N9, P24

I. Introduction

Inclusive growth is a concept that advances equitable opportunities for economic participants during economic growth with benefits incurred by every section of society. This concept expands upon traditional economic growth models to include a focus on the equity of health, human capital, environmental quality, social protection, and food security. The definition of inclusive growth implies direct links between the macroeconomic and microeconomic determinants of the economy and economic growth. The macroeconomic dimension captures the importance of structural transformation of economic diversification and competition, while the macro dimension refers to changes in economic aggregates such as the country's gross national product (GNP) or gross domestic product (GDP), total factor productivity, and aggregate factor inputs. Sustainable economic growth requires inclusive growth. Maintaining this is sometimes difficult because economic growth may give rise to negative externalities, such as a rise in corruption, which is a major problem in developing countries. Nonetheless, an emphasis on inclusiveness—especially on equality of opportunity in terms of access to markets, resources, and an unbiased regulatory environment—is an essential ingredient of successful growth. The inclusive growth approach takes a longer-term perspective, as the focus is on productive employment as a means of increasing the incomes of poor and excluded groups and raising their standards of living. In order for growth to be sustainable and effective in reducing poverty, it needs to be inclusive (Berg and others 2011a; Kraay, 2004). The Commission on Growth and Development 2008 notes that inclusiveness—a concept that encompasses equity, equality of opportunity, and protection in market and employment transitions—is an essential ingredient of any successful growth strategy. However, attempts to measure inclusive growth have remained limited. Traditionally, poverty (or inequality) and economic growth analyses have been done separately. 1 Recent work indicates that there may not be a trade-off between equity and efficiency as suggested by Okun (1975) and that it would be a big mistake to separate analyses of growth and income distribution (see Berg and Ostry, 2011b). This study examines that the GINI is determined by secondary schooling, urban population and inflation. Inclusive growth is very much responsible for the economic growth. GINI coefficient is used as a proxy to measure income inequality. The low-income inequality refers to inclusive growth. Sustained inclusive growth is accompanied by reduction in poverty through urbanization. If urban population is more productive and closer to each other than we can root out income inequality from the society. Inclusive growth cannot bypass the poor, resulting decreasing income inequality. High income inequality can also affect political stability of the country. So, reducing income inequality is now becoming the major problem of policy makers. Reducing income inequality has generated policy maker's interest to draw out inclusiveness of growth. But policy makers are in the fix that how to define inclusiveness of growth. This term "inclusive growth" ensures that how many economic opportunities are created by growth and how these opportunities are available to the population especially poorer to a possible maximum extent. Thus, the process of growth generates new unevenly distributed economic opportunities. The poor are basically restricted by market failure conditions which restrict them from enjoying these kinds of opportunities. The result is that riches basically benefit more from growth than the poor. As results, growth will not be pro-poor if we left it to the markets. So, governments made some suitable policies which ensure new economic opportunities available to the poor as well. Thus, inclusive growth is defined as the growth which not only creates new employment opportunities, but also guarantee the equal and full access of these economic opportunities. So, according to the definition, this article gives us a method to find out income inequality, based on GINI, between riches and poor. GINI coefficient is a reliable proxy to find out inequality. We used the data from 1980 to 2015.

II. Literature review

Historically, the basic objective of development economics is to improve the standard of living by reducing poverty. In the last few years, the economists are much worried about rising income inequality and income gap within and among nations. Some of the most prominent and important studies are presented here as a review of literature. Barro (2000) examines the relationship between income inequality, investment and growth rate. In case of poor countries, inequality discourages growth while in the case of rich country inequality enhances growth. Growth leads to fall with greater rate as compared to inequality in poor countries whose per capita GDP is less than the $2000 and tends to rise whose per capita GDP is higher than the $2000. Kuznets curve appears as a clear empirical regularity, but this relation does not explain the very large variations in inequality over time. The results explain that Kuznets' value statically significance and its poor fit. Bills and Klenow (2000) analyze that the growth and schooling are strongly correlated within each country. In a model, they examine the ability of human capital by one's elder plays a very important role between growth and schooling. The model is constructed to check the effect of the strength of schooling period on the growth. The results reveal that schooling has one third impact on growth and the reverse causality is also examined to explain its empirical results. Perrson and Tabellini (1994) analyze that inequality is harmful for economic growth. This paper captures the distributional conflict in which political power makes economic decision in order to redistribute the income. In this framework the theoretical model is supported by two ideas, (1) historical panel data

(2) and postwar cross section. These two ideas show a negative relationship between inequality and economic growth. This kind of relationship exists only in a democratic country.

Forbes (2000) states that income inequality effect economic growth negatively. The study uses a set of inequality statistics to reduce measurement error, but in panel estimation to control the omitted variables which are invariant with time. By using a special technique named as generalized moments, he estimates that changes in inequality are related to changes in growth. Results are showing that in a country level, increase in income inequality effects economic growth significantly and positively. Easterly (1999) describes that a diversity of indicators shows the nation's quality of life which is positively related with per capita income. The change in the quality of life is uneven as income grows. In this article, 81 indicators are used, which consist of four time periods and seven subjects, in which 32 are most important. According to SUR estimators, income per capita is significant positive impact on the quality of life. Another estimator, fixed effect, growth also impacts on the quality of life positively. The conclusion reveals that long and variable lags occur between growth and quality of life.

Ali and Son (2007) describe that social opportunity function is an approach to measure the inclusiveness of growth which is related to social welfare function. And this method depends on two factors (1) average opportunities provided to the population (2) and how these opportunities are divided among the population. Social opportunity function and social welfare function have one to one relationship. The empirical results show that how these tools like health and education can be used to spread inclusiveness of growth not in time but over the time periods. Mckinely (2010) made a composite index for the diagnosis of country progress. He identifies some suitable indicators and also given them weights and scores like growth, productive employment and access to economic infrastructure, weighted by 50%, success in reducing income poverty, moderate poverty and inequality, including gender inequality, weighted by 25%, success to achieve basic human capabilities, weighted by 15%, and successfulness of providing social protection, weighted by 10%,. The success of this method is tested in some countries like India, Indonesia and in Bangladesh etc.

Lundberg and squire (2003) draw our attention to a simple methodology in which inequality and growth are measured by their joint determinants in the future. The results of the determinants are not equally exclusive. Government expenditures, inflation and schools-warner index variables are used for growth, land distribution and civil liberties variable used for inequality in which two are independent and shows the trade –off between growth and inequality. The result reveals that the greater the Sachs-warner index, the greater will be the inequity. Growth can be increased by using Schas-warner index without affecting income distribution. The greater the Schas-warner index, the greater will be the growth. Beck et al., (2007) describes that the development in financial condition will increase the income of poor quintile suspiciously and decreases the income inequality. It shows that 40% long-run influence of financial progress on the growth of income of the poor is due to the reduction in income inequality and remaining the 60% is due to the financial progress of aggregate economic development. Moreover, financial progress is related to a fall in portion of the population living below than $1 per day. These outcomes highlight the significance of the financial structure of the poor quintiles.

Anbarci et al., (2009) explain that death due to road accident is going to be 2 million annually in 2020. Others say that per capita income played very important role in this critical situation. By the increase in per capita income, the use of vehicles increases, which further cause to injuries. If a country passes beyond the mean income level the use of traffic facilities tends to rise. Wealthy people will use heavy vehicle to prevent themselves from road war accident by adding another safety measure. This use of heavy vehicle by riches will tend to increase the injury risks towards poor. Superficially, in this war of inequality, size matter. Ravallion and Chen (2002) measure the pro-poor growth by using the mean growth rate of the poor. From economic growth, they examine the gains of the poor. For measuring the level of poverty, a mean growth rate of income of the poor is unpredictable with one or more standard adages. So, the best method of measuring pro-poor growth is to examine the mean growth rate of the poor. Watt index is the method which shows the change in direction in a theoretically defensible mood of measuring the level of poverty. The growth incidence curve is used to measure the pro-poor growth, which also shows how the gain is distributed among the poor.

Alesina and Rodrik (1991) study the correlation between economic growth and political clash through an endogenous growth model with distributive clash. They study the case of two classes; one is workers and capitalist and second is the continuum distribution of agents categorized by capital or labor shares. Several results show the relationship between two groups. In democracy policies are only used for capitalist which maximize the growth. In democracy rate of taxation is comparatively higher than the rate of growth lower. The empirical result is reliable with the implication of the model. Halter et al; (2013) state that inequality is beneficial and harmful to economic growth. In this mechanism

some elements effects rapidly and some are slow in action. In this article a simple theoretical model is used to check the effects of inequality on growth over the time. Our empirical finding shows that in the short term, high inequality raises the economic growth but this situation is harmful for a long period of time. In long run inequality effects economic growth negatively.

Kraay (2005) states growth is pro-poor if poverty processes fall potentially. According to this definition average income is related to a high growth rate, high sensitivity of poverty and poverty reducing pattern of growth. By using these three components we empirically observe the changes in poverty in developing countries. From medium to long run, deviation in changes in poverty is associated with growth in average income. So, the change in poverty is depending upon poverty reducing measures in relative income growth rather than the differences of the sensitivity of poverty. Evidence from cross-countries gives us a little information as to policies and institution that promote other source of pro-poor growth. Dollar and kraay (2004) analyze that globalization effects on inequality, poverty and growth through trade. More than half countries of the world are the globalizing economies and they have reduced their tariff and starts trading due to globalization. Globalization has increased the income of the poor. From average to a proportionate increase in the income of the poor and in growth is just because of globalization that promotes trade between the countries. The evidence shows that globalization is the key determinant of faster growth and reduction in poverty from poor countries.

Quah (2001) uses inequality and growth as a component of a stochastic process. These components have different impact on world income distribution. In global inequality these two components show insignificant result. In this article it is observed that standard panel data on econometric methods yield misleading results of their relation. If we take this data on the account, then inequality is unrelated for economic growth. Ravallion (2001) describes that in developing countries poor share their gains from aggregate expansion and losses their gains from aggregate contraction. Between the countries there are large differences that how much poor share in the growth. But their impact is diversity among the poor in a given country. The cross-country relationship is concerned with data problems, and they hide welfare effects; they can be misleading for growth policy. So. There is a requirement of empirical work on growth and distributional changes at micro level. After doing this we have some basis for specific policies that are required for growth concerned policies.

Frazer (2006) describes that income inequality is involved in different level of development within each country. For cross-country comparison, it uses a nonparametric regression which permits assessments of inequality inside and crosswise the countries. The methodology gives a specific conclusion rather than cross-country regression and is more general in nature. This methodology point out a problem arises with parametric regression, especially with kuzents curve. So, some new results are found and some previous results are confirmed. Deininger and Squire (1998) stated that there is a solid negative correlation in the initial inequality of the asset distribution and long term growth. For the poor, inequality lessens the income growth, but on the rich inequality has no effect. So, the available data on income and asset distribution provides less information about kuzents hypothesis. So, the policies that suggest to reduce the poverty and increase the growth for the poor is facilitated by the acquisition of assets (land) and an increase in aggregate investment is doubtfully beneficial.

Fort (2007) describes that the effect of inequality on growth leads to income distribution effect, but theoretical relationship is more concerned as compared to asset distribution. To overcome this situation they are dealing with some new constraints with time invariant measurements for explanatory variable and used assets variable for this purpose. In this article we find a new theoretical way and empirical test to understand the relation between economic growth and asset distribution. In three decades, he observes 30 countries and used the land Gini index to overcome the past limitations. GMM is used to find the unbiased estimates which are consistent with parameter of interest. By using specific negative sign in regression analysis for land inequality, we find that change in asset distribution among the people is an important factor for economic growth and economic development. Arguello (2006) states that income inequality and growth is positively related to each other. He also finds that U-shaped relationship is not present between changes in income inequality and growth. He also states that there is no negative correlation is present between these factors as we see in literature. The rejection of the random effect estimator is used as the evidence of the omitted variable issue is of consideration and valuable information is learned when time series data of single country is available. So in the country case analysis an unveiling relationship between income inequality and growth, a systematic pattern can be found across the country.

Khalifa and El Hag (2010) describe that inequality leads to economic growth if we channelize the resources towards

those humans whose marginal propensity to save is higher. Now a day in later stages of development, human capital drives out physical capital and regarded as the engine of growth. According to this paper the effect of income inequality on economic growth depends upon the stages of development. From 1970 to 1999 data of 70 countries is used and find a statically significant threshold level of income per capita. So from the below the coefficient of relationship of income inequality and growth is negative and above is positive but not statically significant. Edwards (1997) states the relationship between income distribution trade policies. For developing countries, he analyzes new comparative data and recommended that trade openness does not promote inequality. The result reveals the alternative use of trade policies and income distribution measures. The results have some measurement problem and are not considered as substitutes for detailed historical studies of countries experience with trade reform.

Levine et al., (1999) analyze the exogenous components of financial intermediate development on economic growth. He also observes cross country differences and explains its effect on the level of financial development. By using instrumental variable and dynamic panel technique, it is observed that components of financial intermediate development are positively related to economic growth. The estimation of cross-country data also reveals that a difference in the system helps in differences in financial development. Li et al., (1998) describe that income inequality is relatively stable within each country but varies significantly across the countries. So, an expanded data set provides large supports for both suggestions. Drawing a political economy and imperfect market arguments to describe intertemporal variation in inequality, the empirical findings show two variables connected with measurement of civil liberties, initial level of secondary schooling, financial depth and distribution of land are the most important determinants of inequality. Spilimbergo et al., (1997) analyze the empirical relationship among trade, factor endowment and income distribution. A panel data technique is use which shows that land and capital-intensive countries have an unequal distribution of income as compared to skill intensive countries. The effect of trade on inequality depends upon factor endowment with a way consistent, but not with Hecksher-Ohlin framework. The results are necessary for the division of the sample according to income level, the use of altered ways of trade openness and relative factor abundance and test for the problems of endogeneity.

III. The Model

To integrate equity and growth in a unified measure, we propose a measure of inclusive growth based on a utilitarian social welfare function drawn from consumer choice literature, where inclusive growth depends on two factors: (i) income growth; and (ii) income distribution. Similar to the consumer theory where the indifference curves represent the changes over time in aggregate demand, we decompose the income and substitution effect into growth and distributional components. The underlying social welfare function must satisfy two properties to capture these features: (i) it is increasing in its argument (to capture growth dimension) and (ii) it satisfies the transfer property – any transfer of income from a poor person to a richer person reduces the value of the function (to capture distributional dimension). Following the previous studies Ali (2015), Ali (2018), Ali et al. (2016), Ali and Bibi (2017), Ali and Ahmad (2014), Ali and Audi (2016), Ali and Audi (2018), Ali and Rehman (2015): the model of this study will come as:

$$GINI_t = f(\mathrm{FDI}_t, SSER_t, \mathrm{UP}_t, \mathrm{IN}_t) \qquad (1)$$

$GINI =$ income inequality (Gini)
FDI= foreign direct investment
$SSER =$ level of education (Secondary school enrollment rate)
UP= urban population
IN= national income
$t =$ time period

IV. Econometric Methodology

The use of econometric tools on macroeconomic models is one of the most important aspects within the quantitative economic analysis. In most of macroeconomic data, the involvement of time trend makes the time series data non-stationary and the regression results of this data may be spurious. Nelson and Plosser (1982) mention that mostly time series data of macroeconomic variables have a unit root problem. They conclude that the existence or non-existence of unit root helps to check the authenticity of the data generating process. In the literature, several unit root tests are available for checking the stationarity of the time series data. This study uses Augmented Dickey-Fuller (ADF) unit

root test (1981). Dickey and Fuller (1981) propose the Augmented Dickey-Fuller (ADF). The general forms of the ADF can be written as:

$$\Delta X_t = \delta X_{t-1} + \sum_{j=1}^{q} \varphi_j \Delta X_{t-j} + e_{1t} \qquad (2)$$

$$\Delta X_t = \alpha + \delta X_{t-1} + \sum_{j=1}^{q} \varphi_j \Delta X_{t-j} + e_{2t} \qquad (3)$$

$$\Delta X_t = \alpha + \beta t + \delta X_{t-1} + \sum_{j=1}^{q} \varphi_j \Delta X_{t-j} + e_{3t} \qquad (4)$$

Applying OLS and computing τ statistic of the estimated coefficient of X_{t-1} and comparing it with the Dickey Fuller (1981) critical τ values, if the calculated value of τ statistic is greater than the critical value then the data is stationary. On the other hand, if vice-versa the series is non-stationary.

IV.I. Autoregressive Distributive Lag (ARDL) Approach to Co-Integration

In literature, a number of cointegration tests for macroeconomic analysis are available. Most famous and traditional cointegration tests are the residual based Engle-Granger (1987) test, Maximum Likelihood based on Johansen (1991/1992) and Johansen-Juselius (1990) tests. One thing is common in these tests that they require same order of integration for their analysis. These cointegration tests become invalid and inefficient when the variables of the model have different level of integration. The ARDL bound testing approach presented by Pesaran and Pesaran (1997), Pesaran and Shin (1999), and Pesaran et al., (2001) has numerous advantages over traditional methods of cointegration. Firstly, ARDL can be applied regardless of the order of integration. Secondly, ARDL bounds testing approach to cointegration can be used for small sample size (Mah, 2000). Thirdly, this approach allows to take a sufficient number of lags for capturing the data generating process in a general to specific modeling framework (Laurenceson et al., 2003). Lastly, ARDL gives efficient and valid detailed information about the structural breaks in the data. This technique is based on Unrestricted Vector Error Correction Model (UVECM) which has better properties for short and long-run equilibrium as compared to traditional techniques (Pattichis, 1999). Pesaran and Shin (1997) and later on Pesaran et al. (2001) mention that under certain environment long-run correlation among macroeconomic variables can be found with the help of the Autoregressive Distributive Lag Model (ARDL). After lagging order selection for ARDL procedure, simply OLS can be used for identification and estimation. Valid estimates and inferences can be drawn through the presence of unique long-run alliance that is crucial for cointegration.

$$\Delta \ln Y_t = \beta_1 + \beta_2 t + \beta_3 \ln Y_{t-1} + \beta_4 \ln X_{t-1} + \beta_5 \ln Z_{t-1} + ... + \sum_{h=1}^{p} \beta_h \Delta \ln Y_{t-h} + \sum_{j=0}^{p} \gamma_j \Delta \ln X_{t-j} + \sum_{k=0}^{p} \phi_k \Delta \ln Z_{t-k} + ... + u_{it} \qquad (5)$$

If there exits long-run cointegration relationship among the variables, then for the finding short-run relationship the study uses the Vector Error Correction Model (VECM). The VECM is explained as under:

$$\Delta \ln Y_{it} = \beta_1 + \beta_2 t + \sum_{h=1}^{p} \beta_h \Delta \ln Y_{it-h} + \sum_{j=0}^{p} \gamma_j \Delta \ln X_{t-j} + \sum_{k=0}^{p} \phi_k \Delta \ln Z_{it-k} + \omega ECT_{t-1} + u_t \qquad (6)$$

V. Empirical results and discussion

In the table 1, descriptive statistics are given to overview the properties of the selected data. According to the estimated results Gini, foreign direct investment and urban population are negatively skewed, but secondary school enrollment and inflation are positively skewed. But the result reveals that all the variables have positive kurtosis. According to estimated results, skewness and kurtosis are insignificant and different from zero. So, we reject the null hypothesis of having no normality. Jarque-Bera value reveals that all variables have finite covariance and zero mean. So, we conclude that the selected data are normally distributed.

Table 1: Descriptive statistics

	GINI	FDI	SSER	UP	IN
Mean	-1.055355	19.99681	3.206096	17.54044	8.399945
Median	-1.045595	20.06710	3.220623	17.56161	7.882675
Maximum	-0.891598	22.44425	3.684554	18.10903	20.28612
Minimum	-1.290257	17.19844	2.803688	16.90253	2.539516
Std. Dev.	0.123608	1.326191	0.256315	0.354227	3.855934
Skewness	-0.287181	-0.081700	0.200169	-0.142937	0.654683
Kurtosis	1.920117	2.374705	2.067186	1.885953	3.703704
Jarque-Bera	2.244058	0.626541	1.545618	1.984238	3.314454
Probability	0.325618	0.731052	0.461714	0.370790	0.190667
Sum	-37.99278	719.8852	115.4194	631.4558	302.3980
Sum Sq. Dev.	0.534766	61.55740	2.299405	4.391688	520.3880
Observation	36	36	36	36	36

In the table 2 correlation matrix of the variables is given. The estimated results show that GINI has negative, but significant correlation with foreign direct investment, secondary school and urban population, but insignificant and positive correlation with inflation in the case of Pakistan. Foreign direct investment has positive and significant correlation with secondary school, urban population and inflation. The results also reveal that secondary school enrollment has positive and significant relationship with an urban population, whereas positive but insignificant correlation with inflation. Urban population has also insignificant and positive correlation with inflation. So, the overall result reveals that when the GINI is dependent variable, then all others variable behave positive and significant correlation. And there is no problem of multicolinearity among the variables.

Table 2: Pairwise correlation

GINI	1.00000				
FDI	-0.481460 (-3.20)***	1.00000			
SSE	-0.291316 (-1.77)*	0.788909 (7.48)***	1.00000		
UP	-0.562850 (-3.97)***	0.0883971 (11.02)***	0.918993 (13.59)***	1.00000	
IN	0.219672 (1.31)	0.327334 (2.01)*	0.249313 (1.50)	0.084385 (0.49)	1.00000

NOTE: The asterisks ***, ** and * denote the significant at 1%, 5% and 10% levels, respectively.

The estimated results of unit root tests of GINI model are reported in Table 3. The result of ADF reveals that GINI secondary school, urban population and foreign direct investment are stationary at first difference but inflation is stationary at level. So, the mix order of integration is suitable for ARDL approach.

Table 3: **Unit Root Test: At Level**

Variables	T-statistics	Probability
GINI	-2.143468	0.2298
SSER	-0.905233	0.7743
UP	-0.862946	0.7868
FDI	-1.559769	0.4921
IN	-2.629625	0.0968

Table 4: Unit Root Test: At First Difference

Variables	T-Statistics	Probability
GINI	-4.186948	0.0025
SSER	-4.021311	0.0038
UP	-4.728325	0.0006
FDI	-4.950717	0.000
IN	-6.893714	0.000

Bound test is used to investigate the cointigeration among GINI, secondary school enrollment, urban population, inflation and foreign direct investment. The results of bounds test approach are presented in table 5. The calculated F-Statistic (6.173706) is greater than upper bound (3.52) value of Shin, Pesaran and smith at 10 percent. So, the null hypothesis which confirm the cointegration among all the variables of the model is rejected. So, the F-statistics show the existence of cointegration among the variables.

Table 5: ARDL Bounds Analysis Approach: Dependent Variable LGINI

Critical value	F-Statistic6.173706	
Significance	Lower bound	Upper bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Table 5 describes the lag length criteria in which two lags are introduced to VAR by keeping in mind the observation and all the variables. According to the results all criteria allow lag length 2, Akaike information criterion, sequentially modified LR test statistic, Final prediction error, Schwarz information criterion and Hannan-Quinn information criterion is used for the variables of this model.

Table6: VAR Lag Order Selection Criteria: LGINI, IN, LSSER, LUP, LFDI

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-48.46839	NA	1.60e-05	3.145200	3.369664	3.221748
1	197.4074	404.9719	3.71e-11	-9.847494	-8.500705	-9.388200
2	278.7177	110.0080*	1.50e-12*	-13.15986*	-10.69075*	-12.31782*

Table 7: Estimated Long Run Coefficients using the ARDL Approach: ARDL (1, 2, 0, 0, 1)

Dependent Variable: LGINI

Regressor	Coefficients	Standard-Error	T-Ratio (prob)
LFDI	-0.059634	0.047748	-1.248 (0.223)
ICPI	0.013887	0.006443	2.155 (0.041)
LSSER	-0.388262	0.176322	-2.202 (0.037)
LUP	0.472135	0.220214	2.143 (0.041)
C	-2.942615	2.864234	-1.027 (0.314)

The coefficient of foreign direct investment shows that there is a negative and insignificant correlation between foreign direct investment and GINI. Inflation has a positive and significant relationship with GINI. According to the findings, 1 percent increase in inflation causes the GINI to rise to (0.013887) percent. The secondary school enrollment ratio has negative, but significant relationship with GINI. So, a 1 percent increase in secondary school enrollment creates (-0.3887) percent decrease in GINI. Urban population is a positive and significant relationship with GINI. The results reveal that 1 percent increase in urban population tends to increase the GINI by (0.472135) percent. Overall long run results reveal that inflation and urban population have a positive and significant effect on GINI but secondary school enrollment has negative and significant impact on GINI. Now we reject the null hypothesis that secondary school enrollment does not have any effect on GINI in the case of Pakistan. The results reveal that if the government wants to increase the GINI then it has to reduce secondary school enrollment and enhance urban population and inflation in Pakistan.

The short-run dynamics are plotted below in Table 8. This study uses (VECM) Vector Error correction Model for examining the short-run dynamics among GINI, secondary school, inflation, urban population and foreign direct investment in the case of Pakistan. The finding reveals that secondary school and foreign direct investment have a negative and significant impact on GINI in Pakistan. The result reveals that, in the short-run, there is the positive and insignificant relationship between urban population and GINI. The result reveals that there is positive and significant relationship between inflation and GINI in the case of Pakistan.

Table 8: Error Correction Representation ARDL (1, 2, 0, 0, 1)

Dependent Variable: LGINI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LFDINI)	-0.079381	0.040682	-1.951249	0.0623
D(ICPI)	0.013606	0.006115	2.224951	0.0353
D(LSSER)	-0.380401	0.169530	-2.243855	0.0339
D(LUP)	12.286636	7.861086	1.562969	0.1306
CointEq(-1)	-0.979753	0.170119	-5.759233	0.0000
R-squared	0.477230	Mean dependent var		3.439511
Adjusted R-squared	0.309944	S.D. dependent var		0.092349
S.E. of regression	0.076714	Akaike info criterion		-2.075540
Sum squared resid	0.147126	Schwarz criterion		-1.671503
Log likelihood	44.28417	Hannan-Quinn criter.		-1.937752
F-statistic	2.852776	Durbin-Watson stat		2.319480
Prob(F-statistic)	0.021238			

Table 9: Diagnostic Tests

Test statistics	F-statistic	P-value
Breusch-Godfrey serial correlation LM test	8.684389	F(2,26) 0.0013
Heteroskedasticity Test Breusch-Pagan-Godfrey	2.490978	F(6,28) 0.0466

The results of diagnostic tests are given in Table 9. The empirical results of Breusch-Godfrey serial correlation LM test shows that there is no serial correlation among the variables in selected model. The result reveals that there is no problem of heteroskedasticity.

The stability of model gives us information regarding the estimated model of GINI has been shifted or not over time. The results of Cumulative Sum (CUSUM) and the Cumulative Sum of Squares (CUSUMSQ) test are shown in figure 1 and 2.

FIGURE 1: PLOT OF **CUSUM**

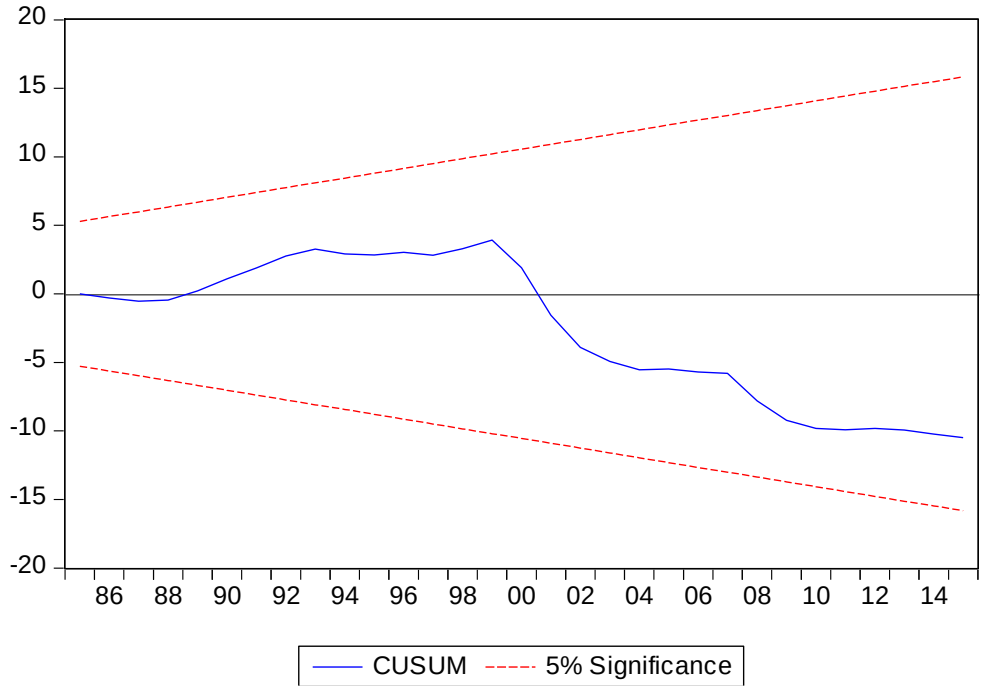
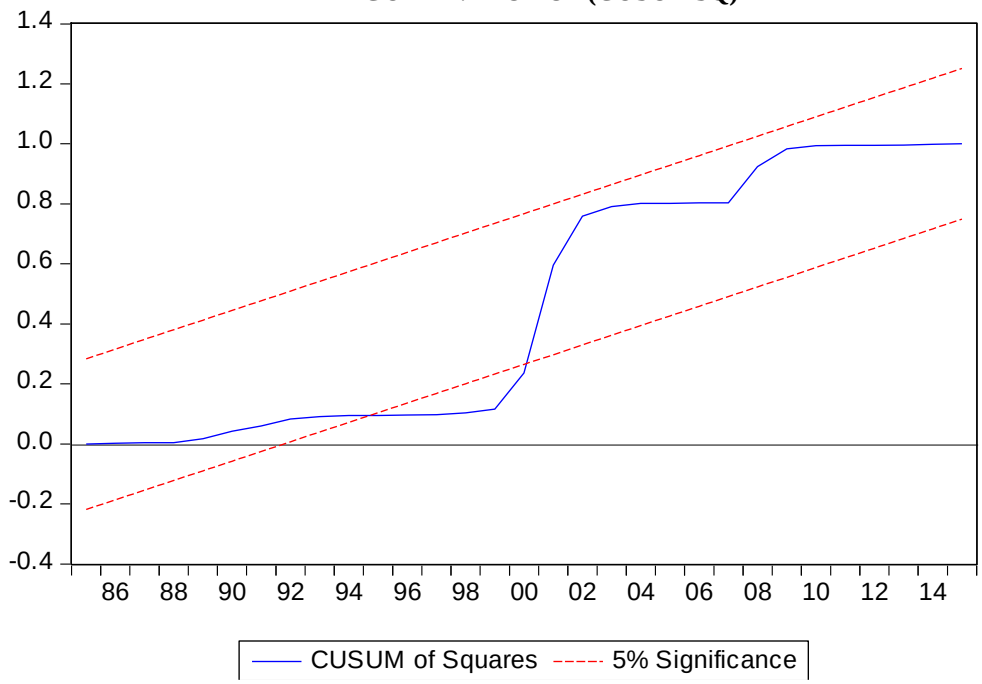


FIGURE 2: PLOT OF **(CUSUMSQ)**



VI. Conclusions and Suggestions

The estimated result of the ARDL bound testing approach reveals that cointegration is present among all the variables of the model. The results of long run analysis reveal that inflation and urban population have a positive and significant relationship with GINI in the case of Pakistan, while secondary school enrollment has negative and significant relationship with GINI. The diagnostic tests reveal that there is no problem of serial correlation and heteroscedasticity. So, the model explains that the data is normally distributed with correct functional form. This study concludes that if the government wants to increase GINI then government has to pay its role in such a way that urban population and inflation increases over the time. For this purpose, appropriate policy is needed to be in action in Pakistan. This policy also helps us to understand poverty reduction strategy and brings equality in Pakistan for development.

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