



Evaluating the Dilemma of Inflation, Poverty and Unemployment

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Abstract

The main aim of this study is to investigate the existence of long run relationship among poverty, inflation, and unemployment. For the sake of empirical analysis this study employs ARDL approach to find out long run relationships by using data from 1975-2013 from WDI. The reverse of Human development index (HDI) has been used as a proxy of multidimensional poverty. The index has been constructed on the same lines as the HDI is developed by UNDP with the help of four indicators i.e. life expectancy, infant mortality, per capita income, and mean year schooling. Independent variables are unemployment, inflation, and dependency ratio, and population growth, government expenditures on education, trade openness, and remittances. The empirical results suggested the validation of employing ARDL holds, and the existence of long run relationship between poverty, inflation, and unemployment has been found. The results are suggestive that unemployment and inflation both bring about increase in poverty. Further findings of the study indicate that dependency ratio, remittances, and population growth are also having significant impacts on poverty in the long run. Finally these results are not only valid for the long run but they even held in the short run as well.

Keywords: Inflation, Multidimensional Poverty, Dependency Ratio, Population Growth, Human Development Index

JEL Code: P24, P36, P42

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I. Introduction

Unemployment, inflation and poverty are a familiar enemy of Pakistan. The overpowering expected unenthusiastic brunt of squat economic growth, lofty double-digit inflation and degenerating energy crisis have badly affected the poverty level. By taking the data of the last 38 years from secondary sources, long-run correlation among inflation, unemployment, poverty and economic growth have been established by resorting to co-integration technique. Future recommendations to cope with the upcoming challenges have also been suggested.

Unemployment and inflation are tribulations of great concern for policy makers of both developing and developed countries. Sky-scraping economic growth, price stability, stumpy unemployment and poverty alleviation are the most desirable macroeconomic ambitions. The triumph of government policies is manifested in squat level of inflation, stubby unemployment and pudgy poverty level. The nature and outlay of these goals can have elemental impact on the economy and society. These objectives cannot be achieved discretely; they are intricately associated with each other (Cheema and Atta, 2014).

Indubitably, components of the macroeconomic goals which the government aspires to achieve are the upholding of unwavering domestic price level, acquisition of full-employment and poverty alleviation. Macroeconomic performance is adjudicated by three broad measures namely unemployment rate, inflation rate and the growth rate of production (Ugwuanyi, 2004).

Global unemployment levitated to 197.3 million in 2012, an increase of 4.2 million over the preceding year and 28.4 million more than the level in 2007, the year prior to the crisis. Moreover, given the deceleration in activity, the ILO's baseline protuberance is an auxiliary corrosion in 2013, with the worldwide unemployment pace flashing up to 6 per cent and a further amplification in the amount of unemployed around the world to 5.1 million. This can have unpleasant long-term consequences for the workforce in terms of reduced skills, growing skill divergences, and reduced employability, basing on the economies trend rates of output growth (ILO, 2013).

In 2007, more than 34 million people all around the globe went out of job due to the financial crisis. Even after the crisis, the number of young unemployed augmented from 73.5 million in 2007 to 77.7 million in 2010 (ILO, 2011). Thus, it affected the unemployment level and discouraged the poverty reduction program badly. However, the unemployment rate is reducing after 2010.

Unemployment and inflation are issues that are central to both the social and economic life of every country. The existing literature refers to unemployment and inflation as constituting a vicious circle that explains the endemic nature of poverty in developing countries. It has been argued that continuous improvement in productivity which brings about the adequate supply of goods and services is the surest way to break the vicious circle, (Umaru et al., 2013).

The scientific literature on poverty-related causes (Akoum 2008; Lenagala and Ram 2010; Dao 2008; Smith 2010) identified the primary factors that can cause poverty, which are unemployment, unequal distribution of resources in the global economy, the inability to reconcile the personal income to the cost of living, lack of education and at the same time, acute dearth of employment opportunities, that are largely shaping the county's sustainable development (Sileika and Bekeryte, 2013).

Unemployment situation in Pakistan has aggravated because of rapid population growth, lackluster economic growth, fiscal indiscipline, escalating debt-servicing and non-development expenditures which have adversely affected the Pakistan economic development and poverty reduction strategies. Unemployment rate in a country is a complementary indicator of income opportunities in the legal labor market. Therefore, when unemployment rate increases the opportunities for earning income decreases, (GILLANI et al., 2009) resulting in poverty.

According to statistics, Unemployment rate has increased to 6.2 percent in 2012-13, as compared to 6.0 percent in 2010-11. The inflation rate, measured by the changes in CPI, averaged at 8.7 percent during July-April, 2013-14 against 7.7 percent in the comparable period last year. On the other side, according to official poverty line Pakistan has estimated poverty by using consumption based methodology, and it reported that poverty has declined from 22.3percent in 2005-06 to 12.4 percent in 2010-11 (Economic Unemployment situation in Pakistan has aggravated because of rapid population growth, lackluster economic growth, fiscal indiscipline, escalating debt-servicing and non-development expenditures which have adversely affected the Pakistan economic development and poverty reduction strategies. Unemployment rate in a country is a complementary indicator of income opportunities in the legal labor market. Therefore, when unemployment rate increases the opportunities for earning income decreases,(GILLANI et al., 2009) resulting in poverty.

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There are no significant studies in Pakistan which have laid emphasis on inflation, unemployment and poverty. Therefore, the relation of these macroeconomic factors has also not been ascertained. In a practical working economy, there are all macro-economic variables exercising their respective influence at the same time on the whole economy. Hence to study an economy empirically, combine influence of all variables should be taken into account in order to understand the economy holistically. There is no concept of laboratory in Economics, as compared to the pure sciences, where individual effect of a substance can be checked separately in a laboratory. As the economy is a complex phenomenon and in order to understand it, all major macro-economic variables should be evaluated together and their combined effect may be noticed, in order to ascertain the true and empirical picture of the economy. Shahid, (2014) emphasized merely on impact of inflation and unemployment on economic growth while Umair and Ullah, (2013) studied the impact of GDP and inflation, on unemployment rate neglecting the joint effect it exercises on the economy. Similarly Maqbool et al., (2013) and Arslan and Zaman, (2014) analyzed and assessed, merely, the determinants of unemployment restricting the study only to determinants.

Although, Wajid and Kalim, (2012) emphasized on the impact of inflation, economic growth coupled with trade openness and urban population on unemployment of the economy, it failed to exercise joint impact of these macroeconomic variables on the Pakistani economy. More distinct and concerning work was done by Mirza et al., (2015) who checked the association between unemployment rate and inflation rate, failing to take into account the important macroeconomic variable of poverty, hence confining the study to only two macro economic variables. Similar was the study of Al-zeaud and Al-hosban, (2015) who checked the relationship of unemployment and inflation as compared to the unemployment and inflation rates conducted in the above mentioned study of Mirza et al., (2015), again confining the study to only two macroeconomic variables, hence limiting the study.

In comparison to all the above mentioned studies, present study is distinct and different, as it is an organized attempt to assess the combine relation of Inflation, economic growth, Unemployment and Poverty together as it has never been analyzed together in the literature before. Similarly, it is distinctive in a sense that after observing the complex and viscous relations of inflation, unemployment, poverty and economic growth, the long and short run relationship are established in it. Besides this, the estimated results would be useful for future decision making and the suggestions to cope with the present scenario

have also been incorporated for the guidance of the stakeholders in the contemporary economies of the world.

The macroeconomic indicators mentioned above, have always posed a great challenge to the successive administrations in Pakistan, as it is being confronted to other developing and underdeveloped countries of the world. Currently, governmental and many non-governmental organizations have portrayed that more than a quarter of Pakistani residents are living below poverty line. According to Human development index (HDI) report: Pakistan, Bangladesh, and India stand at 0.572, 0.543 and 0.612 respectively. This report also shows an irregular distribution of wealth in Pakistan where top ten percent of the population earns 27.6% and bottom 10% earns only 4.1% of the income. There are many factors accountable for poverty in Pakistan; although in this study relation among inflation, economic growth, unemployment and poverty have been analyzed and focused.

So this study have tried to assess the long run as well as short run relationship of unemployment and poverty; while taking economic growth and inflation too. To assess the relationship, the data of last 38 years has been taken and the long run relationship has been estimated to observe the complex and viscous relations of inflation, unemployment, poverty and economic growth as well. The estimated results will be useful for the future decision making procedure along with the suggestions to cope with the present scenario.

II. Objectives of the Study

The study carries following objectives:

- To estimate short run relationship among four major indicators of economy. (Unemployment, Poverty, Inflation and Economic Growth), for Pakistan.
- To estimate the long run relationship among 4 major indicators of the economy (Unemployment, Poverty, Inflation and Economic Growth), for Pakistan.
- To give suggestions and future policy recommendations.

III. Methodology

This section entails detailed discussion over description of variables, data source of concerned variables, and fabrication of model. The main focus of this chapter will be on theoretical framework, construction of multidimensional poverty index, and ARDL approach specification to analyze long run relationship between poverty, unemployment, and inflation.

Data Source and Description of the Variables

Table 3.1 Definition of the Variables

Name of Variables	Description	Unit
Poverty (pov)	Used as dependent variable and is representing multidimensional poverty.	percentage
inflation (infl)	Consumer price index is taken for inflation	Percentage
Public expenditures on education (EE)	Overall expenditures made by government in education sector as a percentage of GDP during a year	Percentage

Unemployment (UE)	Unemployment, total (% of total labor force) (national estimate)	Percentage
Trade openness (TO)	(Export+ Import)/ GDP and multiply by 100	Percentage
Dependency Ratio (DR)	Age dependency ratio (% of working-age population)	Percentage
Population Growth (Pop gr)	Annual population growth rate	Percentage
Remittances (R)	Personal remittances, received (% of GDP)	Percentage

The data has been taken from two major sources, World Development Indicator (WDI) for the period 1975 to 2013. Now we extend our discussion on the construction of variables which will be used in this study such as poverty, inflation, unemployment, trade openness, dependency ratio, population growth, and expenditures on education etc., and these are given as follows.

IV. Construction of Multidimensional Poverty Index

Multidimensional poverty is dragging attention of the contemporary researchers due to the criticism on absolute poverty measurement. This study constructs multidimensional poverty index on the basis of four indicators such as infant mortality, life expectancy which are indicators of health, and mean year schooling which is indicator of education, and fourth indicator is per capita income which is indicator of purchasing power of the people. We constructed this index as Human Development Index (HDI) by UNO. We took following steps to construct these indices.

First step: Creating the Dimension Indices

In first step, indicators are transformed into indices between 1 and 0 via setting maximum and minimum values to obtain normalized indicators. This is also called dimension index which is calculates as: Dimension Index (DI) is equal to actual value of indicator minus minimum value of indicator is divided by difference between maximum value and minimum values of indicators. Specifically it can be written in following equation.

$$D.I = \frac{x_i - x_{\min}}{x_{\max} - x_{\min}} \dots\dots\dots (3.1)$$

Where

x_i = Actual values of indicators where i= 1, 2, 3, 4,,, n

x_{\min} = Minimum value of indicator

x_{\max} = Maximum value

Second step: Aggregation of Sub-indices to Construct Multidimensional Poverty Index

In second step, by assigning equal weights, geometric mean has been used to aggregate all sub-indices of dimensions to construct multidimensional poverty index. It can be specified as given below:

$$MPI = \left(I_{life} + I_{schooling} + I_{GDP\ pc} + I_{IMR} \right)^{1/4} \dots\dots\dots (3.2)$$

Where MPI = Multidimensional poverty index

- I_{life} = Normalized Life Expectancy (years)
- $I_{schooling}$ = Normalized Mean Years Schooling
- $I_{GDP pc}$ = Normalized GDP Per Capita
- I_{IMR} = Normalized infant mortality rate

Above procedure is described in Human Development Report (2013). After constructing the above index we multiply it by 100 to obtain poverty in percentage.

Inflation: It is measured by Consumer Price Index (CPI) base on 2005 and data of it taken from World Development Indicator (WDI). It is expected that it may have positive impacts on poverty in Pakistan.

Unemployment: Unemployment rate is percentage annual unemployment in Pakistan. It is expected to be having positive impacts on poverty impacts on poverty which means it engenders poverty.

Dependency Ratio: It is calculated by dividing the total number of unproductive age group below 15 and above 64 years age group with total number of working age groups (15-64 years).

Trade Openness: Trade openness is indicator of market liberalization which is calculated by addition of export and import, and is divided by GDP.

Population Growth: Annual percentage of population growth which is taken from WDI.

Remittance Receiving: Personal remittances received (% GDP) in a Pakistan. It is expected to have negative sign which may show negative impacts on poverty.

V. Theoretical Framework

Initially, multidimensional poverty can be gauged from Sen (1985) that lack of capabilities and fundamental needs for the human beings are the phenomenon which is to be redressed. This definition makes evident that poverty can be scrupulously measured by a number of factors of wellbeing. This seminal work further breaks the grounds for policy makers or researchers to have poverty incidences via suggesting two way progressions to measure the underlying prevalence of the poverty. This two way progression comprises identification and aggregation. Identification stage refers to make out the poor or to identify the poor, while second stage, aggregation addresses measurement of the poverty after having recognition of the factors, affecting poverty.

Conventionally, poverty is seen through the means of unidirectional factors which embedded with monetary indicators such as income and expenditure approaches. Intuition and logical reasoning is observed by the proponent of unidirectional money-metric approach that potential purchasing power leads households to enjoy wealthier and healthier life by dint of having higher income or efficient purchasing power (Townsend, 1970; World Bank, 2000; Laderchi et al., 2003; Rao, 2006). The major negative aspect of this approach is a belief that market exists (for) or supports to all attributes. Nonetheless, market fails whenever some attributes or public goods cannot be purchased owing to existence of imperfect markets. Income related approach fails to give surety of quality of life even a household is concentrating on above the specified poverty line. Second drawback of this money-metric approach is that a household may not be a poor according to income or consumption approach but it may be deprived of some basic necessities of life, with some members of his family (Thorbecke, 2005; Mariaraet al., 2010).

Having discussed the money-metric approach or one-dimensional poverty, another approach which is non-money-metric poverty is proposed by Sen (1976, 1985). He focused on deprivation of the ends by comparing with deprivation of means. Therefore, this approach deals wellbeing with fixing consideration on the freedom of choice and achievements. The term basic capabilities are the paramount concern of this approach and it can be explained in terms of wellbeing of a human such as people should be capable of well fed and educated themselves, be healthier and decent to lead their life. They ought to be least

concern to meet their basic provisions of life (Townsend, 1979; Mariaraet al., 2010). For that reason, inclusion of the least level of capabilities ought to be inevitable, while constructing poverty indices. Therefore this study will deal multidimensional poverty and will follow four macro indicators such life expectancy, infant mortality, mean year schooling, and per capita income. These are indicators of health, education, and living standard.

V.I. Unemployment and Poverty

Researchers' approach to unemployment and poverty relationship is two-fold. Some scholars argue that unemployment is directly influenced by poverty (Saunders 2002; Ukpere and Slabert 2009; Apergis et al. 2011), others (Clifton and Marlar 2011) indicate that poorer countries do not always have higher unemployment rates. One can accept the scientific view that unemployment and poverty are two closely related problems facing the present world economy.

Unemployment is exacerbating the economic crisis and reduces the overall purchasing power of the nation. This leads to poverty, which in turn, increases the debt burden and unemployment. Unemployment and poverty are more common in less developed countries. However, due to the global economic downturn, the recently-developed countries face their challenges.

One of the indicators of well-being is a low poverty rate. Selected welfare model and the implementation of social policy determine the lining standards and the expression levels of poverty, unemployment and social exclusion. Saunders (2002) states direct and indirect impact of unemployment on poverty and inequity. Finally, unemployment is destroying the funding base of welfare programs and increases poverty and social inequality. Namely unemployment worsens poverty. High poverty, as a rule, coexists with unemployment, thus the direct relationship between these two problems can be seen. However it is often discussed that relationship between unemployment and poverty depends on controversy. The analysis units to determine labor force status are individual, and poverty research focus on income units, thus, a person may have low income and still not be bankrupt until other family members have revenue that is shared - this is sufficient to say that the family is living above poverty line. Being unemployed does not necessary mean living below or above poverty line.

V.II. Unemployment, Inflation and Poverty

It is important to seek out the relationship between poverty, unemployment, and inflation. Existing literature regarding Philips curve, we know there is relationship between unemployment and inflation. Unemployment and inflation both affects living standard of people due to low income level. This may engender poor condition of health. There exists some direct relationship between inflation, unemployment, and poverty. Inflation and unemployment have positive effects on poverty because they adversely affect purchasing power of people, health, education, and economic well-being of the people. We are quite interested to investigate relationship between unemployment, poverty, and inflation. If it exists then this study will try to observe these results either they are long run or short run. It may be functioned as follows.

Poverty= f (inflation, unemployment, and other control variables)

V.III. ECONOMETRIC MODEL

The standard procedure of empirically analyzing the long-run relationships and dynamic interactions among the variables of interest considers two commonly used techniques i.e. Engel-Granger Cointegration and Johansen Co integration test. These approaches have been widely criticized because of some limitations. Firstly, it ignores short run dynamics when estimating the cointegrating vector. Secondly, when short run dynamics are complex, it often biases of the long run relationship in finite sample. Pesaran et al (2001) has introduced an alternative Co integration technique known as 'Autoregressive Distributed Lag, or bound tests. It has been argued that ARDL has a numerous of

advantages over conventional techniques. Therefore, this study would use ARDL to estimate equation 3.3.

It is suitable to check the stationarity of data before estimation analysis as the nature of the data is time series. There are various unit root tests for this purpose, like Phillips-Perron test and Schmidt-Phillips test but to check the stationarity of data Augmented Dickey Fuller (ADF) test is used here in this study. By using the test it is found that all variables were not stationary at level i-e: $I=0$. No variable was found to be integrated of order two [$I(2)$], dependent variable was stationary at first difference whereas some of the explanatory variables stationary at level and others at first difference. So the suited model in this case is Auto Regressive Distributed Lag (ARDL).

AUGMENTED DICKEY-FULLER (ADF) TEST

First difference lags are included in ADF to make the error term μ_t white noise. In this case the regression equation can be written in the following form:

$$\Delta y_t = \alpha + \beta_t + \lambda y_{t-1} + \sum_{i=1}^k \beta_i \Delta Y_{t-1} + \mu_t$$

The above equation contains trend and intercept which accurately depicts the procedure of ADF test. Where intercept is α , coefficient of the time trend is β_t , coefficient of y_{t-1} is λ while lag order of the autoregressive process is k . First difference of y_t and y_{t-1} is given by $\Delta y_t = y_t - y_{t-1}$.

The testing procedure is illustrated below;

First to take null and alternative hypothesis as;

$$H_0: \alpha = 0 \quad \text{series is stationary}$$

$$H_1: \alpha < 0 \quad \text{series is non-stationary}$$

Determining test statistic using,

$$F\tau = \hat{\alpha} / SE(\hat{\alpha})$$

Where $SE(\hat{\alpha})$ is the standard error of α .

Then comparing test statistic calculated with critical value Dickey-Fuller table, either to accept the null hypothesis to reject it.

If $F\tau$ is less than the critical value, then alternate hypothesis will be accepted which mean variable of the series does not contain a unit root and are non-stationary and vice versa. If all variables are found to be stationary at level, then OLS will be applied and if the order of differencing is same the appropriate technique is to use the Johansen Co-integration test. Also, if variables are found to be stationary at different levels then the study will use the Autoregressive Distributed Lagged (ARDL) approach.

AUTOREGRESSIVE DISTRIBUTED LAGGED (ARDL)

It is used when the variables are stationary at different levels, as in this technique all the variables are assumed to be integrated of different orders. One of ARDL procedure is that it does not involve pre testing of the variables, the variables can stationary at first difference or stationary at level be integrated at order of order one ($I=1$), or integrated at order ($I=0$) or mixed of both. So, in this situation standard co-integration becomes unstable because the power of the test to determine co-integration between variables is quite low. Autoregressive Distributed Lagged (ARDL) requires that no independent variables have integrated order higher than one with dependent variable stationary at first difference. While the standard co-integration estimates the long run relationship among variables involving a system of equations and the ARDL model only takes reduced form equation [Pesaran and Shin, (1995)]. Different variables are having different lags in ARDL technique which can't be estimated by standard co-integration, and most importantly, it can used with limited sample set of critical values developed by Narayan (2004) by using GUASS.

ARDL process comprises of two stages. First it tests the long run relationship by using the F-statistics for the determination of the significance of lagged variables in the unrestricted error correction model. Secondly, the coefficients of both long run and error correction model (short run) are estimated. Unrestricted error correction model (ECM), regression of y on the vector x , involved following method and can be written as;

$$\Delta pov_t = a_0 + a_1 \cdot t + \phi pov_{t-1} + \delta_1 inf_{t-1} + \delta_2 UE_{t-1} + \delta_3 TO_{t-1} + \delta_4 EE_{t-1} + \delta_5 DR_{t-1} + \delta_6 popgro_{t-1} + \delta_7 R_{t-1} + \sum_{i=1}^p \psi_i \Delta pov_{t-i} + \sum_{i=0}^q \phi_{i1} \Delta inf_{t-1} + \sum_{i=0}^q \phi_{i2} \Delta UE_{t-1} + \sum_{i=0}^q \phi_{i3} \Delta TO_{t-1} + \sum_{i=0}^q \phi_{i4} \Delta EE_{t-1} + \sum_{i=0}^q \phi_{i5} \Delta DR_{t-1} + \sum_{i=0}^q \phi_{i6} \Delta popgr_{t-1} + \sum_{i=0}^q \phi_{i7} \Delta R_{t-1} + \varepsilon_t$$

with ϕ and δ 's as the long-run multipliers, Ψ 's and ϕ 's as short-run dynamic coefficients, (p,q) as the order of the underlying ARDL-model (p refers to y i.e. poverty, q refers to x i.e. explanatory variables), t as a deterministic time trend, k as the number of 'forcing variables', Δ as the first difference operator or change between two consecutive periods and ε_t as white noise error. Schwarz Bayesian Criteria (SBC) is used in this study for selecting the number of lags in the Auto Regressive Distributed Lag (ARDL) model.

For analyzing long run relation F-test is used to test null hypothesis which assumes the coefficients of lagged variables to be simultaneously equal to zero (0) implying the existing of long-run relation between variables. Alternative hypothesis assumes that at least one of these coefficients is not equal to zero. It is written as;

$$H_0: \delta_K = 0 \text{ for all } k$$

$$H_0: \delta_K \neq 0 \text{ for at least one } k$$

LONG RUN ANALYSIS

Long run coefficients are estimated by the following equation after the existence of long run relationship.

$$pov_t = a_0 + a_1 \cdot t + \sum_{i=1}^p \psi_i pov_{t-1} + \sum_{i=0}^q \phi_i inf_{t-i} + \sum_{i=0}^q \phi_i UE_{t-i} + \sum_{i=0}^q \phi_i TO_{t-i} + \sum_{i=0}^q \phi_i EE_{t-i} + \sum_{i=0}^q \phi_i DR_{t-i} + \sum_{i=0}^q \phi_i popgr_{t-i} + \sum_{i=0}^q \phi_i R_{t-i} + \varepsilon_t$$

SHORT RUN ANALYSIS BY ERROR CORRECTION MODEL

When long run equilibrium relation is confirmed between dependent and independent variables, then it enables us to capture short run dynamics of the model by applying ECM. ECM is no longer applicable if there is no long-run relation amongst variables. Significant coefficient of ECM explains that a short run variation between dependent and independent variables will yield stable long run relation amongst these variables.

$$pov_t = a_0 + a_1 \cdot t + \sum_{i=1}^p \psi_i \Delta pov_{t-i} + \sum_{i=0}^q \phi_{i1} \Delta inf_{t-1} + \sum_{i=0}^q \phi_{i2} \Delta UE_{t-1} + \sum_{i=0}^q \phi_{i3} \Delta TO_{t-1} + \sum_{i=0}^q \phi_{i4} \Delta EE_{t-1} + \sum_{i=0}^q \phi_{i5} \Delta DR_{t-1} + \sum_{i=0}^q \phi_{i6} \Delta Pop gr_{t-1} + \sum_{i=0}^q \phi_{i7} \Delta R_{t-1} + \Gamma ECM$$

Where the error correction term can be estimated from the following equation

$$\Gamma ECM = pov_t - [a_0 + a_1 \cdot t + \sum_{i=1}^p \psi_i \Delta pov_{t-i} + \sum_{i=0}^q \phi_{i1} inf_{t-1} + \sum_{i=0}^q \phi_{i2} \Delta UE_{t-1} + \sum_{i=0}^q \phi_{i3} \Delta TO_{t-1} + \sum_{i=0}^q \phi_{i4} \Delta EE_{t-1} + \sum_{i=0}^q \phi_{i5} \Delta DR_{t-1} + \sum_{i=0}^q \phi_{i6} \Delta Pop gr_{t-1} + \sum_{i=0}^q \phi_{i7} \Delta R_{t-1}]$$

$\Gamma = 0$ when dependent and independent variables are in their equilibrium. If ECM technique is proper, then $-1 < \Gamma < 0$. This long term effect will be distributed over future time periods according to the rate of error correction $-\Gamma$.

VII. RESULTS AND DISCUSSION

This section covers the detailed discussion about the results derived. Results of the Augmented Dickey-Fuller test followed by Auto Regressive Distributive Lag (ARDL) model along with diagnostics of the proposed model are given in the subsequent sections.

STATIONARITY RESULTS USING ADF TEST

Dealing with the time series data the estimation process is started by applying Augmented Dickey-Fuller (ADF) test. Results of ADF test is shown in table 1.

TABLE 1: STATIONARITY RESULTS OF STUDY VARIABLES

	Level of difference	ADF T Statistic	Critical value	Prob.
Poverty	I(1)	-7.603199	-4.198503*	0.0000
Inflation	I(1)	-4.552431	-4.234972*	0.0045
Unemployment	I(0)	-10.52739	-4.198503*	0.0000
Education Expenditure	I(1)	-3.689420	-3.523623**	0.0344
Trade Openness	I(0)	-4.334918	-4.192337*	0.0069
Dependency Ratio	I(0)	-3.991096	-3.520787**	0.0166
Remittances	I(1)	-6.854008	-4.198503*	0.0000
Population Growth	I(1)	-6.104367	-4.205004*	0.0000

*1 % level of significance

**5 % level of significance above

results of Augmented Dickey-Fuller test show that no variable is integrated of order 2 and all variables are stationary at first difference [I(1)] or stationary at level [I(0)] at 1% and only 2 variables at 5% level of significance. Multidimensional poverty (dependent variable) is stationary at first difference [I(1)] at one percent level of significance. Inflation is stationary at first difference [I(1)] at 1% level of significance. Unemployment is stationary at level [I(0)] at 1 % level of significance. Expenditures on education is stationary at first difference [I(1)] at 5 % level of significance. Trade openness is integrated at level [I(0)] at 1 % level of significance. Dependency ratio is also stationary at level [I(0)] but the level of significance is 5 %. Another variable, remittance receiving is also stationary at first difference [I(1)] at 1 % level of significance. And population growth is stationary at first difference [I(1)] at 1 % level of significance.

Above results of the Augmented Dickey-Fuller test show that no variable is integrated of order two [I(2)] at 5% level of significance. These results further explain that dependent variable is integrated of order one while three of the explanatory variables are stationary at level and other are stationary at first difference. So these results motivate to use Auto Regressive Distributed Lag (ARDL) model which is the most suited model of co-integration for such type of data.

INVESTIGATION OF LONG-RUN RELATIONSHIP

The results of Wald (F-statistics) are given in the following table

Table 2: F-Statistics for Bound Test

Equation	F-Calculated (P-Value)	F-statistics Critical values at 5% level ^ I(0)-----I(1)	Result
FY(POVERTY/INFLATION, UNEMPLOYMENT,)	9.56(0.013)**	(4.1)------(5.29)	CO-INTEGRATION

** REPRESENT SIGNIFICANT LEVEL AT 5% LEVEL

^ CRITICAL VALUES FOR THE WALD TEST (F-STATISTICS) ARE TAKEN FROM PESARAN ET AL., (2001) TABLE CI(III), CASE III

Above table shows that the value of F-cal is greater than the upper bound critical value which confirms the existence of long run relationship between poverty and inflation, and unemployment. After the confirmation of long run relationships the long run and short run parameters are estimated in next step.

LONG RUN RELATIONSHIP BETWEEN POVERTY, INFLATION AND UNEMPLOYMENT

By applying ARDL model, the regression line is estimated firstly for long run relationship between dependent and independent variables.

Table 3 Long Run Relationship between Poverty, Inflation, and Poverty

Dependent Variable= Poverty			
Variables	Coefficient	T-Ratio	Probability
Inflation	.89234	1.8309	.079
Unemployment	1.2344	2.6461	.014
Dependency Ratio	.00253	5.6241	.000
Remittances	-0.00123	-1.9189	.066
Education Expenditure	-0.01766	-1.1458	.262
Population growth	.33953	1.9293	.065
Trade Openness	.027068	1.4052	.172
TRND	-.17415	-2.0675	.049

Estimated results obtained from Auto Regressive Distributed Lag model (ARDL) indicate that inflation has positive and statistically significant impacts on multidimensional poverty in the long run. It is suggestive that other things holding constant, as inflation rate raises it causes increase in poverty in long run. Intuitively, increase in inflation rate directly reduces the purchasing power of the people which affects health condition, education expenditures of the people. Ultimately, it leaves indirect effects on multidimensional poverty in Pakistan. The positive effects of inflation on poverty are commensurate with the finding of Benin et al(2009); Gilaniet al. (2009). It can be evidently viewed from table 4.3.

Unemployment rate has positive and statistically significant effects on poverty. It shows long run relationship between unemployment and poverty are persistently existed. Logically it (unemployment) is worsening the economic conditions of the country, and brings about reduction in overall purchasing power of the people. This intensifies the poverty and makes people of nation deprive of enjoying good health, education, and causing social exclusion. Further it leads to poverty, which in turn increases the debt burden and unemployment. Unemployment and poverty are more common in less developed countries like Pakistan. However, due to the global economic downturn, the recently-developed countries face their challenges. These long run results are matched with the studies of Gilaniet al (2009); Sileika and Bekeryte (2013).

Dependency ratio has positive and highly significant impacts on poverty. It indicates that other things remaining constant, the higher the dependency ratio, the higher poverty in long run because the increasing members of unproductive age groups put pressure on working members which consequently requires more money to feed, provision of good health, and education, and all these things increase poverty. It worsens the overall economic wellbeing indicators where people may not enjoy higher life expectancy, and lowering mean year schooling, and declining per capita income. These relationships hold in long run. Poverty causing effects of dependency ratio are enormously found in household level studies.

Remittance receiving has negative and significant impacts on poverty. The higher remittance receiving the lesser poverty will be. Remittances causes increase in purchasing power of the nation and it is catalyst to increase health and education status of the nation. Further, population growth rate has negative and significant long run impacts on poverty. The higher population growth rates bring about increase in unemployment, health and education related issues which cause deteriorating condition of the living standard of the nation. These results are matched with the results of Sajidet al (2014).

Public expenditures on education have no significant impacts on poverty in long run whereas impacts of trade openness are not found significant on poverty. Trade openness is an indicator of market liberalization but its impacts are quite controversial in literature but in the case of Pakistan, according to our study, it has no significant impacts on poverty in long run.

Concluding the discussion of long run impacts, we can evidently see the long run relationship exists between poverty and unemployment, and inflation.

SHORT RUN RELATIONSHIP BETWEEN POVERTY, INFLATION, AND UNEMPLOYMENT

In short run inflation and unemployment also have positive and significant impacts on poverty. It means inflation and unemployment engender poverty even in short run. Furthermore, dependency ratio also has positive and significant impacts on poverty in short run. The remittances receiving also found negatively and significantly affecting poverty in short run. Furthermore the coefficient of the ECM term is -.68759 and statistically significant which shows that 68.75% adjustment will take place within one year towards equilibrium.

Short-run coefficients of the estimates are given in table 4.

Table 4 Short Run Relationship between Poverty, Inflation, and Unemployment

Dependent Variable= Multidimensional Poverty			
Repressor	Coefficient	T-Ratio	Probability
d(Inflation)	.65283	1.7435	.092
d(Unemployment)	.90305	2.8466	.008
d(Trade Openness)	-.00031	-1.6525	.110
d(Dependency Ratio)	.00907	1.8491	.075
d(Education Expenditure)	.01292	1.1319	.267
d(Population Growth)	.10988	.99525	.328
d(Remittances)	-.012130	-1.70	0.090
ECM(-1)	-.68759	-6.7122	.000

Having held erudite discussion of relationship between poverty, inflation, and unemployment, we come to conclude that results obtained from applying ARDL indicate that there are existence of long run relationship between poverty and inflation, and unemployment in Pakistan. Unemployment and inflation causes poverty in long run and short run in Pakistan.

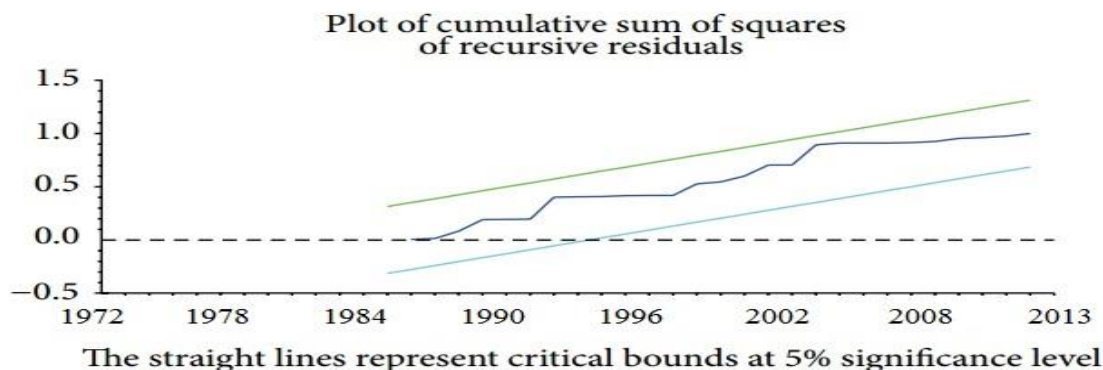
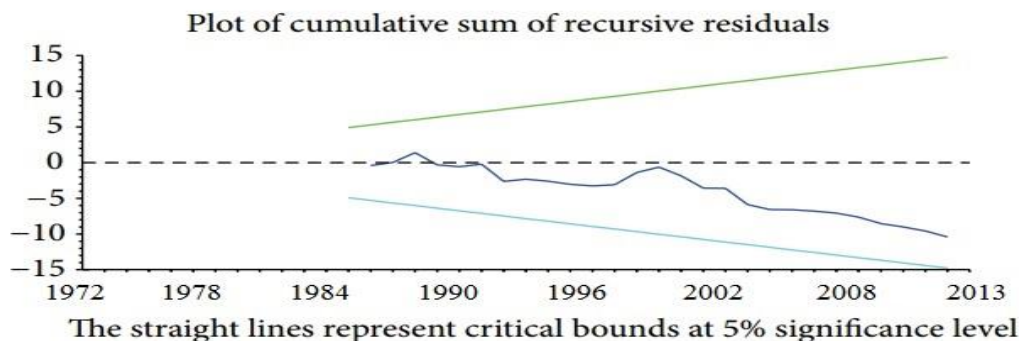
VIII. RESULTS OF DIAGNOSTIC TESTS

Final specification satisfies all the diagnostic including Lagrange multiplier test for serial correlation, Ramsey's RESET for functional form, Jarque–Bera test for normality and White test for heteroscedasticity. The plot of cumulative sum or recursive residuals (CUSUM) and cumulative sum of square recursive residual (CUSUMQ) confirms no evidence of mis-specification and structural instability for the estimation period of the model. Results of these tests and plotted residual are given in the following table (4.5) and figure 4.1.

TABLE 4.5: DIAGNOSTICS FOR THE ESTIMATED MODEL

Test Statistics	LM Version (CHSQ)	Probability
Lagrange multiplier test for serial correlation	.035144	[.851]
Ramsey's RESET for functional form	3.3657	[.021]
Jarque–Bera test for normality	1.4091	[.494]
White test for heteroscedasticity	.51978	[.410]

FIGURE 1



IX. CONCLUSION AND POLICY RECOMMENDATIONS

This section has covered discussion on concluding this study, and after conclusion some policies will be suggested on the basis of obtained results.

X. CONCLUDING REMARKS

There is long debate on poverty related issue in literature where so many causes are discussed. Especially unemployment and inflation are two important factors which engender poverty. Country like Pakistan who is under the umbrella of economic and social difficulties, poverty, unemployment, and inflation have become highly under discussion issue. It is imperative to see through any existence of the relationship among poverty, unemployment, and inflation. Either this relationship exists in long run or short run. Therefore the main concern of this study is to investigate the long run relationship between poverty, unemployment, and inflation. This has employed ARDL approach by using data from 1975-2013 which is collected from WDI.

The calculation of poverty has been one the biggest problem in poverty related studies. Mostly researchers have been employing money metric approach while recently all lot of criticism has been found on it because of its limitations. Now multidimensional poverty has been much appealed by researchers. It has been given much attention. Therefore this study kept focus on multidimensional poverty instead of money metric approach, and an index has been constructed as Human Development Index (HDI) is generated. For the sake of poverty, we take reverse of HDI which can be interpreted as poverty. It has been constructed on the basis of four indicators i.e. life expectancy rate, infant mortality rate, per capita income, and mean year schooling. These four indicators determine the multidimensional poverty for national level, and it is constructed by similar method as is generated by UNDP.

The dependent variable of this study is multidimensional poverty and it has been regressed two explanatory variables inflation, and unemployment along with control variables such as remittances, government expenditures on education, trade openness, dependency ratio, and population growth. The ARDL approach has been used because dependent variable is found stationary at integrated (1), and whereas independent variables are not stationary at same level. The estimated results suggested the existence of long run relationship between poverty, inflation, and unemployment. The results further indicated that inflation, and unemployment has significant impacts on poverty. Unemployment and inflation cause poverty in long run.

The empirically obtained results indicated that remittances, and dependency ratio has statistically significant impacts on poverty. Remittances are helpful to control poverty whereas dependency ratio has negative and significant impacts on poverty which means dependency ratio engenders poverty. Rests of the variables have statistically insignificant impacts on poverty long run. Furthermore, ECM suggests the confirmation of the relation even in short run.

This study employs some diagnostic tests, and finally specification satisfies all the diagnostic including Lagrange multiplier test for serial correlation, Ramsey's RESET for functional form, Jarque–Bera test for normality and White test for heteroscedasticity. The plot of cumulative sum or recursive residuals (CUSUM) and cumulative sum of square recursive residual (CUSUMQ) confirms no evidence of miss-specification and structural instability for the estimation period of the model.

XI. POLICY RECOMMENDATIONS

Keeping in view the above findings and conclusions some recommendations are given as under.

- The results suggests the significant and adverse impacts of unemployment, and inflation on poverty, so there must be created some jobs through private and public sector both by formulating the policies which encourage investment in country. Foreign and local investors must be given incentive by providing them environment which could be conducive for investment.
- There is theoretically trade-off between unemployment, and inflation in short run. Unemployment must be prioritized over inflation in short run because employed people

can afford inflation but unemployed people cannot bear both unemployment, and inflation both. Therefore, policy makers must do focus on removing unemployment.

- Remittances are found helpful removing poverty. People must earn remittances and invest it in country.
- Dependency ratio is ratio of unproductive age group to productive age groups, and it has adverse impacts on poverty. The solution of reducing dependency ratio is creating jobs in market, and secondly, controlling population as well.

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