ROLE OF SOCIAL PROTECTION IN POVERTY REDUCTION IN PAKISTAN: A Quantitative Approach

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This paper examines the role of social protection through different channels (education, health, social transfers, subsidies, etc.) which are helpful in reducing poverty in Pakistan. Unlike the existing literature, the paper considers the quantitative model of social protection policies to reduce the poverty. To handle this issue, a time series data set containing thirty-one observations, is used for the period 1982–2012. An Autoregressive distributed lag model (ARDL) is used to identify the long-run, as well as the short-term relationship between the social protection indicators and the poverty. It is concluded that outreach of social protection via expenditures on education, foreign aid and *zakat* play a significant role in poverty reduction. Moreover, the autocratic period has proved itself a mechanism to reduce poverty by social protection provisions as compared to the democratic period but remain insignificant.

I. Introduction

Social protection is a key factor for policy measure to mitigate poverty in emerging economies. In a broader sense social protection has three major functions in developing countries: (1) to protect those people who are near or below the poverty line, by enhancing their consumption patterns through social assistance (aid process); (2) to facilitate common man who faces the persistent poverty, by investing on human development process; (3) to develop a roadmap for those who are living below the poverty line, explaining how to get rid of poverty circles [Barrientos and Hulme (2005)]. For economic development and poverty reduction there is a consensus about the appropriate policy environment [Conway, et al. (2000)]. It is also marked that economic equality is important for two reasons: (1) lower inequality includes more equal distribution and access to land and other assets which underwrites to sustainable economic growth;[1] (2) the International Development Targets are more probable to be achieved with lower level of inequality. Hence, so-

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[1]Kanbur (2008).

cial policies, i.e., public involvement to support livelihoods and adoptive social integration are necessary to achieve essential economic growth.

The literature shows that various international development agencies have different social protection scenarios but some common issues are: (1) to underline risk and vulnerability that show the dynamics of poverty; (2) to attend the need to protect the poorest. This framework focuses on protection for vulnerable and poor, rather than the promotion of well-being, in general. According to the International Labour Organization (ILO), government organizations are responsible for social protection of their individuals from the vulnerable situation like poor living standards and the contingencies. In a broader sense, there are three intents existing under the umbrella of social protection: social insurance (old-age benefits, maternity, sickness and unemployment), social assistance (protect the poor), and labour market regulations. Normally, social insurance is concerned with contribution of workers, whereas social assistant is based on tax financing. A society does not want to prolong with risk, vulnerability and poverty; it needs public action to adjust all these under the social protection programs [Conway, et al. 2000)].

The social protection's major objectives are to reduce poverty and support the poor. Barrientos and Hulme (2005) and Conway, et al. (2000) described that each country has its own social protection measures that differ in accordance with the circumstances, particularly in developing countries; but it emphasises more on poverty reduction - as a major outcome of the social protection. Developed countries explain the social protection by stabilizing the income levels and improving living standards of their individuals.

According to the World Bank (2012), major function of the social protection is to address causes of poverty. Furthermore, the social protections also focus on risk and vulnerability in the emerging economies.

1.   *Social Protection Mechanisms in Pakistan*

In order to know the social protection mechanisms in Pakistan, Table 1 provides a summary of its structure. Generally in Pakistan, the social protection consists of four pillars: social security/social insurance, social assistance, labour market operations and micro-finance/insurance in the informal sector. A number of programs in each category were developed in different years to protect deserving people in the form of social protection in Pakistan.

Social protection helps to increase public services in terms of human capital investments, like health and education that increase productivity and encourage poor people to participate in labour markets. Studies on Latin America and South Africa frequently highlighted significant improvement in education and health outcomes: especially in the social health initiatives, conditional and unconditional cash transfer programs [Samson, et al. (2006) and Samson, et al. (2004)]. The social pro-

TABLE 1

Social Protection Mechanisms in Pakistan

Category	Type	Initiated	Objective	Source of Funds
Social Security/Social Insurance	Government Servants Pension Fund.	1954	Provide benefits to government employees and old age pension.	Employees' contribution and government budget allocation.
	Provincial Employees Social Security/ Insurance Schemes.	1967	Benefits provided to formal private sector employees in the form of health care, etc.	Employees' contribution.
	Public Sector Benevolent. Funds and Group Insurance.	1969	Group insurance and benevolent fund provision to public sector employees.	Employees contribution.
	Workers Welfare Fund (WWF).	1971	Cash transfer and housing facilities to the registered people.	Employees contribution.
	Workers Children, Education Ordinance.	1972	Free education to the registered workers' children.	Employees contribution.
	Employees Old Age Benefit Institutions (EOBI).	1976	Old age pension and grants to the registered worker.	Employees contribution and budget funds.
Social Assistance	Zakat and Ushr.	1980	Cash transfer to the deprived people.	General public.
	Pakistan Bait-UL-Mall.	1992	Cash transfer to those, not eligible for Zakat and minorities.	Public and private support.
	The Benazir Income Support Programme.	2008	Cash transfer to the deprived common citizens.	Federal government budget allocation.
	Subsidy on Wheat, Sugar and Fertilizer.	early 1960s	Subsidy on wheat, sugar and fertilizers.	Government of Pakistan.
	Utility Stores.	1971	Provision of consumer items at lower rate than the open market.	Government of Pakistan.
Labor Market Programs	Public Work Programs	1983	Unemployment benefits through wage creation.	Public budget allocation.
	People's Rozgar Programs	1995	Low interest rate loans.	Federal government and National Bank Schemes.
Micro-finance /insurance	Micro Finance.	early 1980s	Small scale loans.	Donors, NGOs and some Private sectors.
	Micro-Insurance.	early 1980s	Insurance at small scale.	Donors, NGOs and Private sector participants.

Source: Sayeed (2004), Jamal (2010) and GOP (2012).

tection indicator in Pakistan does not display the true picture. According to the World Bank reports around 30.9 per cent children - age below 5 years, were underweight in 2014 - Pakistan hold 14th position in the World rank.[2] The infant mortality rate is 85.5 per 1,000 births [World Bank (2013)]. Indicators related to education does not show an attractive picture as the net enrolment rate of children's primary education was 57 per cent [Pakistan Social and Living Standards Measurement (PSLM) survey, 2012-13], from which only 50 per cent completed their primary education. Around 33 per cent of the total children have never been enrolled in school and the overall literacy rate is 58 per cent in Pakistan. There is also a supply side problem as most children have never been able to go to school, due to financial or some other family constraint. On an average the availability of appropriate health-care and other hygiene might play a significant role in bad conditions of health indicators. Social protection in the form of subsidies can play virtuous roles in poverty reduction. In 2012-13 the federal subsidy was around Pk.Rs.358 billion (about 1.6 per cent of the GDP) from which 96.1 per cent of the subsidies were confined to the power sector [GOP (2014)]. In 2011, the richest people of population availed the benefits of around 30 per cent of the total subsidies but the poorest 20 per cent availed only 10 per cent of the subsidy.[3]
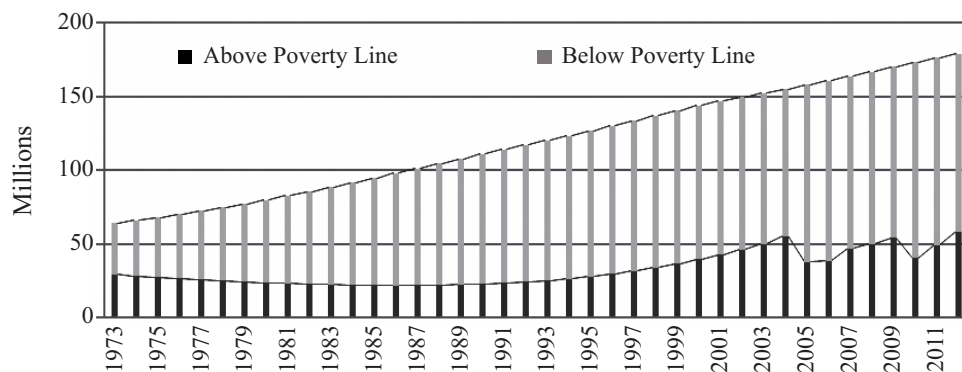
FIGURE 1

Poverty Trends in Pakistan

The resource method introduced by Sen (1985) disclosed that a gap between resources and wellbeing creates poverty. According to Bigsten and Levin (2005) poverty is defined, when an individual is unable to earn $1/- a day. In the decade of nineties 40 per cent of population was living under the poverty line but now this

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[2]*Source*: World Fact Book (2014).

[3]See, Trimble, et al. (2011).

has decreased to 29 per cent of the world population. The main causes of poverty in Pakistan are unemployment, lack of assets ownership and increase of unskilled labour. The poverty can be mitigated by capacity building of poor and enhancing investment in education, health, poverty reduction based activities, etc. It is the responsibility of government to provide social protection to its citizens, through guidance and assistance. It can be done through efficient allocation of resources in some areas where people live below the poverty line.

2. *Significance of the Study*

Since poverty reduction is a key objective of emerging economies, the states try to make strong policies and actions for implementing them. There are number of ways through which poverty can be reduced - social protection is one of them. This study highlights the social protection channels that explore economic activities and are helpful to reduce poverty in Pakistan. The literature provides evidence of different studies with indicators like subsidies and transfers, *Zakat* fund, foreign aid, health and education expenditures. This study incorporates all these indicators to check their role in poverty reduction in Pakistan. This study also incorporates the nature of social protection under different government regimes, like the democratic and autocratic one in Pakistan.

The remaining part of the study consists of sections where the past literature, describing linkages between social protection expenditures and poverty is reviewed in Section II. Section III explains the data source and econometric model, and Section IV present the empirical results. Conclusion, policy implications and limitation of the study are given in Section V.

II. Review of Literature

In the empirical prospects, extensive work/studies are undertaken to generate links between the social protection expenditures and the poverty. In context to urban poverty, Awan, et al. (2011) explains the impact of education on human development and poverty and predict that poor people can break the poverty circle if they are educated. They also suggest that the government needs to come forward to concentrate on primary education. Njung (2010), empirically tested the effect of education on poverty in Cameroon and found a negative relationship between them and described that efforts to impart education will wipe out the poverty.[4] Moreover, to reduce poverty, male education is more productive than the females. By increasing the fiscal space for education purposes, poverty reduction process can be ensured only by the government.

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[4]Also see, Omoniyi (2013).

Janjua and Kamal (2011) conducted a panel study of 40 developing counties to check the role of education and income in poverty reduction. It was found that for poverty reduction, income growth plays a vital role as compared to income distribution. CPRC (2008)[5] disclosed that education is a crucial factor for people to remain together, over time. Geda, et al. (2005) investigated the factors determining poverty in Kenya and their econometric analysis showed that the levels of education play a significant role in poverty reduction and that lack of education is accountable for high prospects of poverty. Pervaz (2014), Harper, et al. (2003), and Londono (1996), explained the role of education in poverty reduction and the economic growth, by improving socioeconomic status of the society.

A good health provision is an investment in the form of human and capital that encourages the economic growth. Investment on health is like an enhancement of development projects. The efficient utilization of resources in health sector can alleviate the poverty. As Brearley, et al. (2012) explain a mechanism by which maternal, newborn and child health-care expenditure exacerbate poverty with a focus on evidence from Asia and the Pacific. They found that maternal, neonatal and child health (MNCH) has a huge variation across poor people in Asia and the Pacific. It was also found that such type of health-care expenditures absorb a significant share of family income. On the other hand, public sector spending on health is also insufficient, inefficient and inadequate to fulfill the need of deserving individuals because sometime, people have to borrow more than double their income, to meet such health care expenditures. Somanathan, et al. (2004) estimated the public and private expenditures on reproductive health service in South Asia and Sri Lanka, where low standards of social protection system create inconvenient to overcome the provision of MNCH care expenditures. However, this review views that poverty can be reduced through increasing the MNCH care expenditures.

Wolge (2011) developed a link between health and poverty in the United States and found that a significant gap is visible between rich and poor with respect to health and mortality– better, latest and improved health facilities are available to rich but not the poor. It is predicted that this gap can be reduced with improvement in income level of the poor, steadily in the long run. Bibi (2002) made a comparison of general subsidies and targeted transfers to check the impact on poverty, by using the data-set from Tunisia. He concluded that targeted transfers are more effective than the food subsidies in poverty reduction. Youssef (2003) empirically tested the role of food subsidies in poverty reduction in Egypt and concluded that structural reforms are needed for the provision of food subsidy to eliminate poverty, but it is seen that huge part of the subsidies move towards the rich, [(Salevurakis and Haleim (2008)]. Nwafor, et al. (2006) examined the effect of removing petroleum subsidies on poverty in Nigeria. They concluded that removing petroleum subsidies proves

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[5]Chronic Poverty Research Centre, Manchaster, UK.

less effective for rural poverty as compared to the urban poverty. Burns, et al. (2010) probed the structure of wage subsidies, employment and poverty in South Africa and proved that wage subsidies are effective for poverty reduction.

Masud and Yontcheva (2005) provided the empirical evidence about the role of foreign aid in poverty reduction and found its indirect effect to reduce it via increasing the human development. Human development is an official objective of all donors who adopt the Millennium Development Goals (MDG). Herzer and Nunnenkamp (2012) made the panel data analysis containing 21 foreign aid recipient countries and empirically tested the impact of foreign aid on reduction of income inequality that would minimize the poverty. They predicted that foreign aid is an effective tool to alleviate poverty in the recipient countries. Hodler (2007) found that aid is effective to reduce poverty by preventing financial leakages through better monitoring system in the aid recipient countries. Magnon (2012) developed a theoretical link in foreign aid, inequalities and poverty while studying the Sub-Saharan African countries and found no strong evidence where foreign aid affected the inequality and poverty, differently with a well-established monitoring system. On the other hand foreign aid reduces poverty, indirectly by targeting pro-poor in the recipient countries [Gomanee, et al. (2003) Gomanee and Morrissey (2002), Mosley and Hudson (2001)]. Arvin and Barillas (2002) revealed that foreign aid is helpful to minimize poverty in East Asia but has an adverse effect in low income countries, due to steeling of resources by elites in the form of rent seeking.

It is a common believe in the Muslim community that *zakat* plays a significant role, morally and socially in an economy. In theoretical and practical prospect, Farah, et al. (2012) examined the role of *zakat* in alleviating poverty in Malaysia. It is also suggested that the fruit of *zakat* can be increased by improving institutional qualities and collaboration with other institutes like, microfinance, which is helpful to reduce poverty. Mohammed (2007) asserts that it is the responsibility of the followers of Islam to pay *zakat* to support the poor Muslims of the society and strengthen the concept of brotherhood. Therefore, money collected through *Zakat* is helpful for poor people to fulfill their basic needs of life. Ethically, *zakat* is a source of sharing wealth which eradicate voracity as it would help to reduce poverty in communities [Gambling and Karim (1986), and Sulaiman (2003)].

Przeworksi, et al. (2000) explored a study using dummy variables to incorporate democracy during the election process; the expectations existed to increase economic activities to enhance social protection and welfare of individuals. Also, the politicians try to take full advantage of their political support via providing social protection against hurdles of the life [Hillman (1982)].

Concluding the literature mentioned above, it is found as to how the social protection indicators like education and health[6] expenditures, subsidies and transfers

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[6]Besley, et al. (2003) used education and health expenditures as a social protection spending.

foreign aid and the *Zakat* funds are helpful to reduce poverty in economies, where poverty reduction is the main objective of social protection? The literature also provides an overview of social protection mechanism in both the developed and developing economies. Any emerging economy like Pakistan can get an idea from the outcome of literature to develop a critical path of social protection programs in order to get its fruits in shape of poverty reduction, stabilizing individual's income and improving living standards of the common citizens.

III. Data Source and Econometric Model

This study is based on time series data, containing thirty-one observations over the period 1982 to 2012. The data on macroeconomic factors like foreign aid, government expenditures, subsidies and transfer on education is obtained from the World Development Indicator (WDI) published by the World Bank. The government expenditures on health is taken from the Pakistan Economic Survey (2013-14); published by the Pakistan Bureau of Statistics. Data on *Zakat* receipts is taken from the handbook of Statistics on Pakistan Economy (2012-13) published by the State Bank of Pakistan. The regression model is given below:

$$HCRATIO_t = f(LHEXP_t, \ LEDUEXP_t, \ LFAID_t, LSB\&TR_t, LZAKAT_t, Dummy) \qquad (1)$$

where the head-count ratio $LHCRATIO_t$ is a dependent variable which describes the percentage of people who are below the poverty line [Jamal (2006)]. Government health expenditure as a percentage of GDP is denoted by $LHEXP_t$, and $LEDUEXP_t$ which are public expenditures on education are denoted as percentage of the GDP. The foreign aid is taken as a percentage of GDP and denoted by $LFAID_t$. The amount of money used in the form of subsidies and transfer as percentage of GDP is denoted by $LSB\&TR_t$. *Zakat* is an important factor used as a percentage of GDP for social protection and is measured as a total amount of *zakat* receipts via different channels as a percentage. Finally the 'Dummy' defines the autocratic and democratic trend in the Pakistan economy where,

$$\text{Dummy} = \begin{cases} 0 = \text{Democracy} \\ 1 = \text{Autocracy} \end{cases}$$

A reduction in health disparity moves toward income growth and reduce poverty.[7] Theoretically, a strong negative association is found between the foreign aid ($LFAID_t$) and poverty.[8] Burns, et al. (2010) and Bibi (2002) proves negative re-

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[7]See,Wolge (2011).

[8]See, Herzer and Nunnenkamp (2012), Magnon (2012), and Masud and Yontcheva (2005).

lationship of wage and food subsidy provision with poverty level. Hence, $LSB\&TR_t$ has a negative correlation with dependent variables in this analysis. $LZAKAT_t$ has an expected negative sign as Nadzri, et al.(2012), Gambling and Karim (1986), and Sulaiman (2003) justified in their empirical analysis. Przeworski, et al. (2000) incorporated the political system by introducing the dummy where value one was for autocratic and zero otherwise. It is expected that democratic era is more helpful for provision of social welfare in the emerging economy, like Pakistan. By limiting the research, only the social protection indicators which are different from the existing poverty models are used in this study.[9]

In order to convert the regression function into a log linear form, a logarithmic form of variables is used, except the dummy variables. More specifically Equation (1) can be elaborated as:

$$LGPBPL_t = \alpha_0 + \alpha_1 LHEXP_t + \alpha_2 LEDUEXP_t + \alpha_3 LFAID_t + \alpha_4 LSB\&TR_t + \quad (2)$$
$$\alpha_5 LGZAKAT_t + Dummy + u_t$$

To test the co-integration it is necessary to integrate all variables in order one, i.e., I (1). Therefore, there is a need to check the unit-root for all social protection indicators and the head-count ratio. In this regard the Augmented Dickey-Fuller (ADF) test is commonly used [Dickey and Fuller (1979), (1981)]. Phillips and Perron (1988) modified the Dickey-Fuller (DF) test further, and established a comprehensive theory of unit root where Monte Carlo simulations shows that the power of numerous ADF tests can be very low. Enders (2010) and Kim (1998) remarked that ADF test is less powerful than the PP test. The time series data stationarity is checked by Equation (3).

$$\Delta Y_t = \theta_1 + \theta_2 t + \delta Y_{t-1} + \sum_{t=1}^{m} \Delta Y_{t-1} + \varepsilon_t \quad (3)$$

where ε_t is the white noise error term.

There are numerous approaches for residual based co-integration like, maximum likelihood based approach of Johansen (1991), (1992), Johansen and Juselius (1990), Engle and Granger (1987). The variables should be integrated in the same order i.e., prerequisite for these co-integration approaches else the model will not be efficient and will reduce the prognostic powers [Perron (1989), (1997)]. Pesaran, et al. (2001) developed the Autoregressive Distributive Lag Model (ARDL) bound testing approach for co-integration which is appropriate for the reasons: First, this method is applicable on small samples as compared to Johansen co-integration technique [Haug (2002)]. Second, it is valid, regardless of the order of integration, i.e., I (0) or I (1), or jointly co-integrated [Pesaran, et al. (2001)]. Third, it provides un-

[9]Ray (1998), Dollar and Kraay (2002), Katy (2009), Anyanwu, John, (2013) constructed the poverty models using economic growth as an indicator but this study only concentrate on social protection indicators. Economic growth indicators can be used with social protection indicators in future studies.

biased long-run estimates with valid t statistics if some of the model regressors are endogenous [Odhiamb (2008)]. Finally, it contributes to assess the short-run, as well as the long-run effects of variables, simultaneously and separately [Bentzen and Engsted (2001)]. The ARDL model is used in the existing study, because of the short-time series data sample and as there is no compulsion of the data series to be integrated at the same order, i.e., $I(0)$ or $I(1)$ for the long-run co-integration.

The unrestricted Error Correction Model (ECM) captures the data generating process with satisfactory lags, within the general to specific framework [Laurenceson and Chai (2003)]. Pesaran and Shin (1999) contended that 'appropriate modification of the order of ARDL model is sufficient, simultaneously to correct residual serial correlation and the problem of endogenous variables'. The ARDL model in poverty and social protection prospect is shown by Equation (4).

$$
\begin{aligned}
\Delta LHCRATIO_t = \ & \alpha_0 + \sum_{j=1}^{p}\alpha_{1j} \Delta LHCRATIO_{t-j} + \sum_{j=0}^{q}\alpha_{2j} \Delta LHEXP_{t-j} + \\
& \sum_{j=0}^{r}\alpha_{3j} \Delta LEDUEXP_{t-j} + \sum_{j=0}^{s}\alpha_{4j} \Delta LFAID_{t-j} + \sum_{j=0}^{u}\alpha_{5j} \Delta LSBTR_{t-j} + \\
& \sum_{j=0}^{v}\alpha_{6j} \Delta LZAKAT_{t-j} + \gamma_1 LHCRATIO_{t-1} + \gamma_2 LHEXP_{t-1} + \\
& \gamma_3 LEDUEXP_{t-1} + \gamma_4 LFAID_{t-1} + \gamma_5 LSBTR_{t-1} + \gamma_6 LZAKAT_{t-1} + \\
& \gamma_7 Dummy + u_t
\end{aligned} \tag{4}
$$

where, Δ is a difference operator and u_t is a white-noise disturbance term. This model estimates the role of social protection expenditures in poverty reduction, in Equation (4) where it can also be observed as an ARDL of order $p, q, r, s, u,$ and v. The equation specifies that poverty trend has a tendency to be influenced and explained by its previous values. The lag structure has been defined by using minimum Akaike Information Criteria (AIC). In the existing model, coefficients of: (i) the lagged values of the first difference of dependent and independent variable(s) are useful for short-run analysis, and (ii) the first lagged values of dependent and independent variables are useful to check the long-run effects of the explanatory variables. Also, the coefficients of variables existing in the model describe the short-run as well as the long-run impacts; where $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5$ and α_6 are the short-run coefficients and $\gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5, \gamma_6$ and γ_7 are the long run coefficients, of variables, and α_0 is an intercept term.

After testing the co-integration among variables in Equation (4), an error correction model is designed by Equation (5).

$$
\begin{aligned}
\Delta LHCRATIO_t = \ & \alpha_0 + \sum_{j=1}^{p}\alpha_{1j} \Delta LHCRATIO_{t-j} + \sum_{j=0}^{q}\alpha_{2j} \Delta LHEXP_{t-j} + \\
& \sum_{j=0}^{r}\alpha_{3j} \Delta LEDUEXP_{t-j} + \sum_{j=0}^{s}\alpha_{4j} \Delta LFAID_{t-j} + \\
& \sum_{j=0}^{u}\alpha_{5j} \Delta LSBTR_{t-j} + \sum_{j=0}^{v}\alpha_{6j} \Delta LZAKAT_{t-j} + \\
& \gamma_1 LHCRATIO_{t-1} + \rho_1 ECM_{t-1} + u_t
\end{aligned} \tag{5}
$$

where error correction term is named as ECM and ρ is described as the speed of adjustment.

IV. Empirical Results

In order to check the role of social protection expenditures in poverty reduction in Pakistan, an empirical analysis is made where Table 2 shows the correlation matrix. It indicates that all explanatory variables are negatively related to the head-count ratio, except the subsidies and transfers whereas the *zakat* and education expenditures are highly correlated with the head-count ratio. Furthermore, there is no multicollinearity problem in the current data set. Also, by increasing the foreign aid and *zakat* fund, the proportional value of government expenditures on education and health are expected to play a significant role for poverty reduction due to negative correlation with head-count ratio. Table 3 provides the descriptive statistics, containing average value of standard deviation, maxima, minima and the number of observations contained by the data sample. Results show that there is no data hetrogeniouty problem.

TABLE 2

Correlation Matrix

	LHCRATIO	LHEXP	LEEXP	LSB&TR	LFAID	LZAKAT	DUMMY
LHCRATIO	1	-0.456	-0.540	0.343	-0.355	-0.638	-0.291
LHEXP		1	0.290	-0.295	0.144	0.853	-0.168
LEEXP			1	-0.282	-0.130	0.181	0.410
LSB&TR				1	0.313	-0.427	-0.382
LFAID					1	0.234	-0.093
LZAKAT						1	-0.122
DUMMY							1

Source: Authors' estimation.

TABLE 3

Descriptive Statistics

	LHCRATIO	LHEXP	LEEXP	LSB&TR	LFAID	LZAKAT	DUMMY
Mean	-0.599	-0.153	0.378	1.289	-0.025	-0.870	0.580
Median	-0.620	-0.123	0.401	1.325	-0.001	-0.785	1.000
Maximum	-0.447	0.077	0.480	1.626	0.417	-0.450	1.000
Minimum	-0.684	-0.613	0.264	0.901	-0.793	-1.708	0.000
Std. Dev.	0.069	0.144	0.064	0.195	0.226	0.366	0.501
Observations	31	31	31	31	31	31	31

Source: Authors' estimation.

With the purpose of checking the data stationarity, the ADF and PP tests are used; the results of which are given in Table 4. The statistics shows that all variables have a unit root problem at I (0) except the LFAID, but it is stationary at I(1). These outcomes ensure that ARDL[10] model is applicable for the given data set. If the data series are integrated at different orders, the ARDL model is applicable.

Before using the ARDL bound testing approach, an Akaike Information Criterion (AIC) is used for the optimal lag length because it has better properties as compared to others [Shahbaz and Rahman (2012)]. Results of the ARDL bound test approach for co-integration are reported in Table 5 which specifies the optimal lag of order one.[11] By using the head-count ratio $LHCRATIO_t$ as a predicted variable, the result shows that the calculated F-statistic (4.4790) outstrips the upper bound critical value at 5 per cent level of significance. It puts forward, the massage about the co-integration between head-count ratio (used for the poverty measure) and the social protection indicators.

TABLE 4

Unit Root ADF and PP Test Results

Variables	ADF				PP			
	I(0)		I(1)		I(0)		I(1)	
	None	Trend	None	Trend	None	Trend	None	Trend
LHCRATIO	-1.81	-2.94	-4.95*	-5.01*	-1.66	-2.72	-7.06*	-9.84*
LHEXP	-1.1	-2.96	-4.65*	-5.05*	-1.06	-2.74	-5.95*	-9.18*
LEDUEXP	-2.90***	-2.9	-3.97*	+-4.00**	-2.08	-2.34	-3.90*	-3.91**
LFAID	-3.30**	-3.50***	-7.54*	-7.41*	-3.25**	-3.48***	-10.47*	-10.64*
LSB&TR	-1.93	-2.1	-5.12*	-5.08*	-1.98	-2.51	-5.13*	-5.09*
LZAKAT	4.30	0.89	-7.70*	-5.40*	3.00	-1.42	-7.90*	-17.01*

Source: Authors' estimation:*, **, *** show the significant values at 1 %, 5 % and 10 % level of significance, respectively.

TABLE 5

ARDL Bound Test Approach

Dependent Variable: LHCRATIO		5% level		10 % level	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound
F. Statistics	4.4790*	3.0024	4.4545	2.4887	3.7689

Source: Authors' estimation: significant value at 5% level of significance.

[10]If variables are integrated at I(r) where r≥2; F-test would be spurious (Ouattara2004) because the assumption behind the critical bounds are that variables are I(0) or I(1) (Narayan 2005, Pesaran, et al. 2001).

[11]During the econometric analysis the maximum lag order, upto one, for the sufficient degree of freedom is used.

The results of long-run, as well as the short-run coefficients are reported in Tables 6 and 7, respectively. In the long-run analysis, empirical evidence shows that social protection via government spending on education purposes *(LEEXP)*, foreign aid *(LFAID)*, and *zakat* fund *(LZAKAT)* plays significant role in poverty reduction in Pakistan. Particularly 0.1 per cent increase in education expenditure is helpful to reduce poverty by 0.65 per cent in the long-run. *Zakat* is an important instrument which plays significant role in poverty reduction where one percent increase in *zakat* fund reduces the head-count ratio by 29 per cent. Furthermore, the subsidies and transfers are also effective in poverty reduction showing insignificant *t* ratio. In the political prospect, autocratic period seams favorable to diminish poverty by using social protection channels. Government health expenditures show contrary results and there is some mismanagement in utilization of funds for the health purposes to maximize its benefits. Also, it can predict that fiscal allocations of resources for health sector are not sufficient to reduce poverty, but macroeconomic stability and efficient institutional setups are equally significant.

TABLE 6

Estimated Long Run Coefficients using the ARDL Approach

Regressor	Dependent Variable is LHCRATIO		
	Coefficient	Standard Error	T-Ratio[Prob.]
LHEXP	0.47069	0.15293	3.0779[.006]
LEEXP	-0.65005	0.15083	-4.3098[.000]
LSB&TR	-0.0399	0.057435	-0.69575[.494]
LFAID	-0.0867	0.039141	-2.2175[.038]
LZAKAT	-0.2956	0.068368	-4.3242[.000]
DUMMY	-0.0030	0.020466	-0.15065[.882]
CON	-0.4791	0.083143	-5.7625[.000]

Source: Authors' estimation.

In the short-run analysis, health expenditures, education expenditures and foreign aid are statistically significant and have negative relationship with head-count ratio, except the health expenditures. Persistent poverty, itself generate vicious cycle of poverty and have its own significance. The results also indicate that the estimated lagged error correction term (ECM_{t-1}) has a negative sign and is statistically significant at one per cent level of significance. It predicts the speed of adjustment from the short-run to the long-run (Table 7).

It is concluded that deviation from short-run to long-run is corrected by 78 per cent, per year. This high speed of adjustment in the head-count ratio might be due to

effectiveness of social protection expenditures. From the diagnostic tests, Table (8) shows that the long-run, as well as the short-run estimations does not contain serial correlation, misspecification in the model, normality issue in the error-term and existence of heteroscedasticity in the data series. R-square value describes that overall social protection indicators explain 86 per cent in the model and F statistics (16.4035), showing overall significance of the model. From Figure-2, it is predicted that CUSUM and CUSUMSQ laying in the boundaries are at 5 per cent level of significance. It describes that all short-run and long-run parameters are stable [Brown, et al. (1975)].

TABLE 7

Error Correction Representation for the Selected ARDL Model

Regressor	Coefficient	Standard Error	T-Ratio [Prob.]
ARDL (1,0,0,0,0,1,0) selected based on Akaike Information Criterion Dependent variable is LHCRATIO			
ΔLHCRATIO(-1)	0.2546	0.1664	2.0193[0.0416]
ΔLHEXP	0.3676	0.0894	4.1089[0.000]
ΔLEEXP	-0.5077	0.1209	-4.1976[0.000]
ΔLSB&TR	-0.0312	0.0438	-0.7125[0.484]
ΔLFAID	-0.0677	0.0320	-2.1139[0.046]
ΔLZAKAT	-0.0420	0.0580	-0.7241[0.477]
ΔLZAKAT(-1)	-0.1624	0.0643	-3.431[0.005]
ECM(-1)	-0.7810	0.1482	-5.2700[0.000]
R-Squared	0.7278	R-Bar-Squared	0.6242
S.E. of Regression	0.0306	F-statistics	F(7,22) 8.0248[0.000]

Source: Authors' Estimation.

TABLE 8

Diagnostic Tests

Test Statistics	LM Version	F Version
Serial Correlation	CHSQ(1) = 0.73471[0.391]	F(1, 15) = 0.5021[0.487]
Functional Form	CHSQ(1) = 0.22452[0.636]	F(1, 15) = 0.1508[0.702]
Normality	CHSQ(2) = 0.1580[0.439]	Not applicable
Heteroscedasticity	CHSQ(1) = 3.4888[0.062]	F(1, 28) = 0.6847[0.257]
R-Squared 0.86205	R-Bar-Squared 0.80950	F(8,21)16.4035[.000]

Source: Authors' estimation.

Plot of Cumulative Sum of Recursive Residuals

The straight lines represent critical bounds at 5% significane level

Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significane level
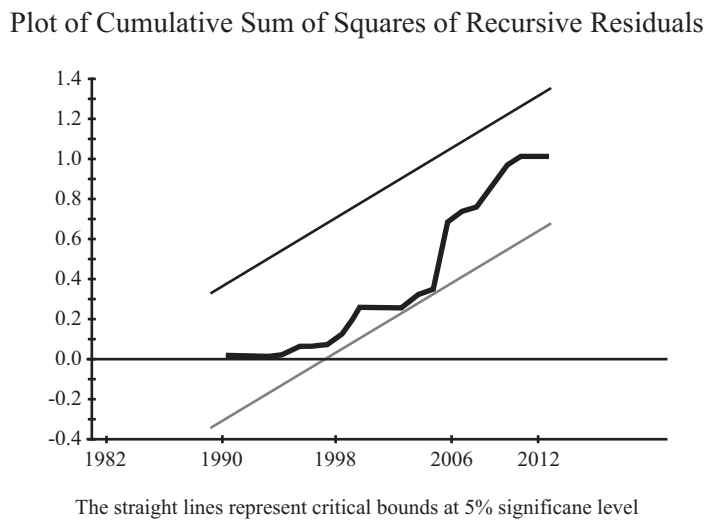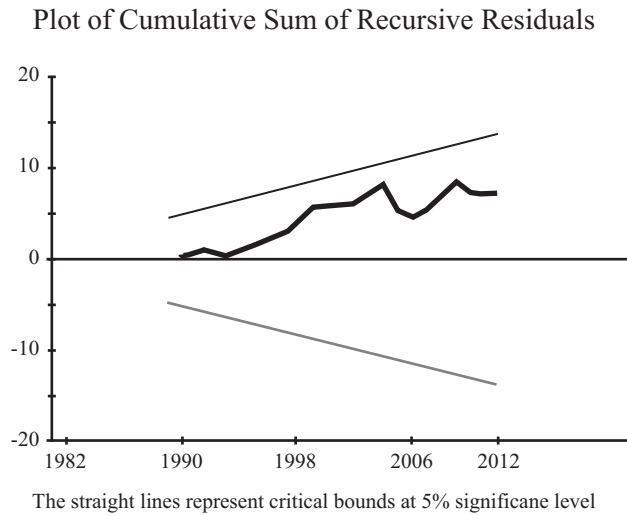
FIGURE 2

Graph of CUSUM and CUSUMSQ for Stability of the Parameters

V.   Conclusion

This study makes an attempt to check performance of social protection indicators to reduce poverty in Pakistan. For this purpose, a quantitative model is constructed with social protection indicators and the poverty measure. A time series data set consisting of thirty-one observations is used over the period 1982 to 2012. An Autoregressive distributed lag model (ARDL) is used to identify the long-run, as well as the short-term relationships between social protection indicators and the poverty measures. The study conclude that social protection tools, such as government expenditures on education, foreign aid and *zakat* fund play a significant role in poverty reduction. In the present case of Pakistan, non-political era with respect to poverty reduction show positive results than the political ones, It shows as to how the odd factors like corruption, bribe and inefficiency exploit the efforts of social protection badly, at higher degree in the democratic era, than the autocratic one. Moreover, by increasing the educational expenditures, proportional value of foreign aid and the appropriate use of *zakat* fund can be effective in poverty reduction in Pakistan. On the other hand, health expenditures show the direct link with the poverty does not support the theory, which describes the positive relationship between the increasing government health expenditures and the poverty itself. It shows that there is misallocation of resources in the health sector or there may be a wrong selection of health indicators to represent the health sector.

1.   *Policy Implication*

The Government of Pakistan needs to have a strict vigilance and import check and balance mechanism to ensure transparency in allocation of the fiscal resources for provision of the social protection. The government also needs to mark those areas, where poverty clusters exist. Allocation of specific funds should be reserved for the provision of merit goods, particularly in the marked areas. The areas like Chulistan, Thar, Sakardu, Dalbadeen, etc., living along the poverty line should be given preferences. Punjab started its education programs for rural areas through the Punjab Education Foundation (PEF), which is educating children at mass scale and have proved to be a role model for other provinces. Sindh has a similar organization, the Sindh Education Foundation (SEF) but it is working inefficiently as its targets needs to be mobilized to get positive results. Although, Foreign Aid is showing significant results but the authorities are handling it inefficiently and many questions have been raised to improve its working. The system needs to be transparent to get benefits from this activity. *Zakat* is a major tool for progress in the Islamic societies like Pakistan. To prevent poverty the formal collection of *Zakat* by formal government is not a popular source of welfare as it is thought by the common citizen of Pakistan. Due to its inefficient ability, mistrust and incapability the allocation of *Zakat* fund more check should be imposed on the process. However, the informal

sources of *Zakat* distribution are quite functional and trustable. People always prefer to distribute *Zakat* to poor at their own sources rather than using the public sources. The government needs to develop the trust of people further and make it functional and popular among citizens by launching unique programs to break the poverty nets.

2. *Limitation of Study*

Except the variables used in this study, other variables of social protection like Benazir Income Support Program (BISP), Pakistan *Bait-UL-Mall* (PBM), labour market programs and microfinancing, which are also helpful to prevent poverty in Pakistan, were not used. Benazir Income Support Program (BISP) was not included in this study as no data was available prior to 2008, whereas the study considers the data of thirty-one years (1982 to 2012). *Bait-ul-Mall* (PBM) was also not included, as the BPM considers the care/help to handicaps and widows for its functional process. The study used the government funds transfer for the social protection which is a segment of Pakistan *Bait-ul-Mall* (PBM). The process needs to investigate empirically, the aggregate role of Pakistan *Bait-UL-Mall* (PBM) in poverty reduction. The labour market and microfinancing programs are too effective to reduce poverty in Pakistan but due to data limitation, such indicators are not used. It is suggested that researchers, policymakers and planners should work on these variables at the micro level in their future studies.

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