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POVERTY, INFLATION AND ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM PAKISTAN

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ABSTRACT

This study aims to investigate the role of economic growth and inflation in explaining the prevalence of poverty in Pakistan. ARDL bound testing approach to co-integration confirms the existence of long run relationship among the variables of poverty, economic growth, inflation, investment and trade openness over the period of 1972-2008. Empirical results show that economic growth and investment have negative and inflation has positive impact on poverty. The effect of trade openness on poverty is insignificant in this study. The short run analysis reveals that economic growth has negative and inflation has positive impact on poverty whereas the role of investment and trade openness in poverty reduction in short run is not significant.

Keywords: Poverty, Inflation, Economic Growth, Pakistan, Macroeconomic Policy, Welfare, Trade Openness

INTRODUCTION

Poverty has always been a matter of concern for policy makers and social scientists. It limits the people's access to basic necessities of life such as food, shelter and clothing and also creates a sense of deprivation among them. It denies their fundamental right to act and chose freely which they would enjoy if not poor. Poor people are generally exposed to the exploitation by state and society. They often lack political power and have less say in the decision making process that had direct impact on their lives. They are more vulnerable to economic shocks such as fluctuations in economic growth and unprecedented rise in inflation. Thus, in case of any economic crises and fatalities, they lose more and pay higher prices than the rich. On the other hand, in good times of economic prosperity, they generally gain less as compared to rich.

Two different kinds of strategies may be adopted to cope with the problem of poverty. The first strategy is to directly target the poor segment of population. This would provide the poor with such prospects which might be helpful in breaking the vicious cycle of poverty. The other strategy to achieve the same goal is to devise such types of policies which would enhance the economic growth as economic growth is assumed to be helpful in reducing poverty [1] and [2].

Like in many other developing countries of the world, poverty is one of the most pressing problems in Pakistan. After a declining trend in the decade of Eighties, poverty had started to rise in Pakistan along with slow economic growth. This was the period when Pakistan adopted trade liberalization policies and was also faced with higher inflation rate. Pakistan’s performance in terms of economic growth was relatively better in the first decade of the 21st Century [3] and [4]. This better performance in terms of economic growth was accompanied by single digit inflation rate and some reduction in the number of people living under the poverty line was witnessed in that decade. However this trend began to reverse after fiscal year 2007-08 and a fall in economic growth along with a rise in inflation and poverty had been observed during the last two years. Thus the country had gone through different episodes of economic growth rates, inflation rates, and poverty. This can be divided into two broader scenarios: The first scenario is high economic growth rate along with low inflation rate and some success in poverty reduction; the second scenario is low economic growth rate along with high inflation rate and a rise in poverty.

The main objective of this paper is to investigate the role played by economic growth and inflation in poverty reduction in Pakistan.

LITERATURE REVIEW

Growth strategies and public policies may affect the welfare of people through their growth and level effects with the passage of time. These welfare effects of public policies may appear in various forms like lowering down the subsidies and other transfer payments by the government to the marginalized people my cause decline in their disposable income as well as increase their propensity to consume. According to endogenous growth theory, low savings negatively affect output growth [5]. A cut in investment by the government (particularly in infrastructure) decreases the private investment in the country which results in low economic growth.

[6] and [7] conclude that increasing the revenues of the government through increasing the tax rate discourages the private investment in the country. This is resulted in decreased economic growth and thus a fall in government revenues in the long run. This limits the government capacity to invest in social and development sectors, which has the effect of more poverty. [8] finds that economic growth of a country is associated with inflation and macro-economic adjustments. The adjustment process reduces the macroeconomic volatility and

increase the economic growth, while inflation hits the poor more severely than the rich and high income people.

[9] and [10] find that the stabilization policies for controlling inflation benefit the poor class instead of rich. There are so many factors which are responsible for high levels of poverty. The poor have to spend larger shares of their income on basic necessities of life. Increased prices of food items have the effect of lower saving by the poor. This is resulted in lower aggregate demand by the poor, which creates excess supply and thus unemployment. By reducing inflation in the long run makes poor’s condition worst in short run. Fiscal adjustment is needed to solve this problem. Moreover the dynamic trade-off is used to lower the worst effects of inflation for the poor. [11] and [12] conclude that low inflation and high economic growth improve the efficient allocation of resources, increase employment, enhance investment, and thus reduce poverty.

There are a number of studies like [13], [14], [15], [16], [17], and [18] which investigate the factors that can reduce poverty. All these studies have consensus on the important role played by the economic growth in reducing poverty. However there are also numerous studies that emphasize inclusive economic growth. They stress that only growth with equity can reduce poverty. Most important among these studies are [19], [20], [21], [22] and [23].

ECONOMETRIC METHODOLOGY

This study first of all tests the level of consistency in the time series involved in our analysis. For this purpose Ng-Perron test of unit root proposed by [24] is used. The reason for preferring Ng-Perron test is that it gives more reliable results as compared with other available unit root tests like ADF, P-P and ADF-GLS when it is applied on small data sets due to its better properties of size and power [25]. After knowing the stationarity level or order of integration of different time series involved in the study, bounds testing approach to co-integration based on Auto Regressive Distributed Lag (ARDL) model suggested by [26] is used to confirm the presence of co-integrating relation of the time series variables of poverty, economic growth, inflation, investment and openness of trade. The data for all variables except poverty is taken from World Development Indicators (WDI) online database by [27]. The data for poverty measured by Percentage of population living below Poverty Line is taken from [28]. ARDL approach is preferred over other available tests of co-integration because results of unit root tests indicate that time series included in the study have mixed order of integration, as some of them are I(0) and others are I(1). The other advantages of this approach include its ability to check for short run dynamics without loss of long run information as this approach is based on the following Unrestricted Vector Error Correction Mechanism (UECM).

$$\Delta y_t = \lambda_0 + \lambda_1 t + \lambda_2 x_{t-1} + \lambda_3 y_{t-1} + \lambda_4 z_{t-1} + \sum_{i=0}^{p} \gamma_i \Delta x_{t-1} + \sum_{j=1}^{p} \alpha_i \Delta y_{t-j} + \sum_{s=0}^{p} w_s \Delta z_{t-s} + \varepsilon_t$$

Where λ_0 represents the intercept and ε_t embodies a white noise series of residuals. The optimum lag length is selected for each variable included in ARDL model through parsimonious method by using either Schwarz information criteria (SIC), Akaike Information Criteria (AIC) or any other criterion used for optimal lag selection. Wald based F-statistics is used for testing the null hypothesis $H_\circ : \lambda_2 = \lambda_3 = \lambda_4 = 0$ stating that there is no co-integration among the variables included in ARDL model against the alternative hypothesis $H_1 : \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq 0$ stating that co-integration exists among them. [26] developed two critical bounds to check the presence of co-integration. When the included variables are I(0) the lower critical bound is treated a decisive bound if all the included variables are I(1) or have mixed order, then upper critical bound is considered as decisive bound. If the included variables are co-integrated, then the long run as well as short run coefficients of variables are considered consistent and reliable.

EMPIRICAL RESULTS

The results of Ng-Perron unit root test are reported in Table-1. The Ng-Perron test is preferred as the results tend to be reliable and consistent compared to the traditional ADF, P-P and ADF-GLS. These tests have some shortcomings that make their results to somewhat inefficient and less reliable. [25] argues that due to their poor size and power properties, these tests are not reliable for small sample data set. These tests seem to over-reject the null hypotheses when it is true and accept it when it is false. Ng-Perron seems to solve the arising problem of over-rejection of null hypotheses. This unit root test can be applied on even small sample data sets. Table-1 shows that poverty (POV), economic growth (GDPPC), investment (INV) and inflation (INF) have unit root problem at level. Only the variable of trade openness (TRD) is stationary at level (is integrated of order 0 or I(0)) and all the remaining variables are stationary at 1st difference i.e. they are integrated of order 1 or I(1).

Table-1: Unit Root Estimation

At Level				
Variable	**Ng-Perron Test Statistics**			
	MZa	**MZt**	**MSB**	**MPT**
POV_t	-12.5001	-2.3205	0.1856	8.2342
$GDPPC_t$	-5.9492	-1.5091	0.2537	15.0338
INV_t	-6.0668	-1.7166	0.2829	14.9941
INF_t	-3.5591	-0.8325	0.2339	18.5853
TRD_t	-20.0371**	-3.1611	0.1578	4.5728
At 1st Difference				
Variable	**Ng-Perron Test Statistics**			
	MZa	**MZt**	**MSB**	**MPT**
ΔPOV_t	-21.5681**	-2.8534	0.1323	6.6437
$\Delta GDPPC_t$	-14.7798*	-2.6837	0.1816	6.3670
ΔINV_t	-16.2762*	-2.7885	0.1713	5.9772
ΔINF_t	-22.3277**	-2.5855	0.1158	8.0998
ΔTRD_t	-33.1875***	-4.0194	0.1211	3.0453

*, ** and *** represent that we may reject the null hypothesis of unit root at 10%, 5% and 1% level of significance respectively.

Appropriate lag order is selected to calculate the F-statistics for cointegration. We take lag 1 using the minimum values of AIC based on vector auto regressive (VAR) approach. Table-2 shows the estimates for ARDL bound testing approach to cointegration. The calculated F-statistics is 4.8753 when poverty, economic growth, inflation, investment and trade openness are included in the model. The critical bounds generated by [26] have been used. The F-statistic is higher than upper critical bound of [26] at the 10 % level of significance. This implies that cointegration exists among poverty, economic growth, inflation, investment and trade openness over the period of 1972-2008 in case of Pakistan.

Table 2: The Results of ARDL Cointegration Test

ARDL (1,0,1,0,1)

F-Statistic = 4.8753**

Level of Significance	Pesaran et al. (2001)	
	Lower Bound Value	**Upper Bound Value**
5%	4.0236	5.2614
10%	3.3751	4.4962

** denote the significant at 10 per cent level. Critical values bounds computed by Pesaran et al. (2001) with unrestricted intercept and unrestricted trend.

Table-3: Long Run coefficients based on ARDL (1,0,1,0,1)

Dependent Variable: POV_t			
Variable	Coefficient	t-Statistic	p-Value
$GDPPC_t$	-0.0025	-3.4296	0.0018
INV_t	-0.4185	-1.8098	0.0804
INF_t	0.3818	4.0084	0.0004
TRD_t	0.0804	0.4254	0.6736
Constant	71.1287	-	-

Table-3 shows the partial effects of independent variables on poverty. Inflation is positively related to poverty and significant at the 1 percent level. Ceteris paribus, one percentage point increase in consumer price index is expected to raise head count ratio of poverty by 0.38 percent. Inflation lowers down the purchasing power of the people and lowers down their real income, as a result, more and more people falls below the poverty line.

The coefficient of economic growth indicates that economic growth has significant and negative effect on poverty. All other things remains the same, a 1000 Pakistani rupees increase in per capita income decrease the percentage of people living below the poverty line by 2.5 percent.

The impact of investment measured by gross capital formation is negative on poverty in case of Pakistan. It implies that, if other things remain constant, rise in investment as a percentage of GDP leads to lower down the percentage of people living below the poverty line. A 1 percent increase in investment as a percentage of GDP will decrease the poverty level by 0.4 percent. This result is significant at 10% level of significance. There is positive and significant impact of trade openness on poverty level in Pakistan. The results indicate that 0.08 percent increase in poverty level is due to 1% increase in total trade as a percentage of GDP.

Table 4 shows that long run results show the similar relationship among the variables as indicated by the results of long run. The results indicate that Inflation is positively and significantly related to the level of poverty and one percentage point increase in consumer price index is expected to raise head count ratio of poverty by 0.43 percent in short run. The short run coefficient of economic growth indicates that economic growth has negative and significant effect on poverty. An increase of 1000 Pakistani rupees in per capita income decreases the percentage of people living below the poverty line by 1.6 percent. The short run impact of investment is negative on poverty in case of Pakistan and one percent increase in investment as a percentage of GDP will decrease the poverty level by 0.33 percent.

There is positive and significant short run relationship between trade openness and level of poverty in Pakistan. The results indicate that 1 percent increase in total trade as a percentage of GDP leads to 0.19 percent increase in poverty level in Pakistan in short run.

Table-4: Short Run Dynamics based on ARDL (1,0,1,0,1)

Dependent Variable = ΔPOV_t			
Variable	**Coefficient**	**t-Statistic**	**p-Value**
$\Delta GDPPC_t$	-0.0016	-1.8643	0.0736
ΔINV_t	-0.3336	-0.9699	0.3410

ΔINF_t	0.4378	4.4230	0.0002
ΔTRD_t	0.1962	1.5131	0.1423
ECM_{t-1}	-0.6913	-2.2597	0.0324
Constant	-0.8431	-	-
$R^2 = 0.628264$ Adj-$R^2 = 0.513884$ F-Statistic = 5.492763 Prob(F-statistic) = 0.000409 Durbin-Watson = 1.607640			

The coefficient of ECM_{t-1} shows speed of adjustment from short run to long run equilibrium and it should be statistically significant with negative sign which is the case here. [29] note that significant lagged error term with negative sign is way to prove that established long run relationship is stable. Our estimated coefficient of ECM_{t-1} is equal to -0.8431. This suggests that any deviation in short run from the long run equilibrium in our poverty model is corrected by 84.31 percent each year.

CONCLUSION

Poverty is one of the most serious challenges faced by the developing countries like Pakistan. Reducing poverty is one of the most important targets of the Millennium Development Goals of the United Nations. However for reducing poverty, it is imperative to understand the factors that cause poverty. This paper is intended to make some contribution in this context. It is argued in this paper that inflation, economic growth, investment, and trade openness are closely linked with poverty in Pakistan. To check the nature and magnitude of this relationship, ARDL bound testing approach to co-integration is used in this study. A time series annual data for all the variables is used over the period of 1972-2008. The Empirical results show that economic growth and investment have significantly reduced poverty, while both the inflation and trade openness have caused an increase in poverty in Pakistan. The empirical results for all the variables are in accordance to the expectations except for trade openness. It is usually argued that trade openness increases output, employment, consumption and thus welfare and reduces poverty. However this argument is not supported by the findings of this paper as far as the direction of the effect of trade openness on poverty is concerned. Although the coefficient on trade openness is not statistically significant, but it carries positive sign, which implies that opening up of trade has increased the level of poverty in Pakistan. This may be due to unfavorable balance of payment as well as worst terms of trade.

POLICY IMPLICATIONS

Poverty reduction is the most important point on the agenda of all national and international organizations and governments. However poverty can be reduced if the factors linked with poverty are dealt with judiciously. This study finds poverty as decreasing function of economic growth, and investment, while as increasing function of inflation, and trade openness. There is no one who can deny the importance of sustained high economic growth and investment for the welfare and development of a country. Similarly rise in prices beyond a certain limit is detrimental to the welfare and development of a country. The policy suggestions for the above mentioned three factors are very simple and straightforward. The policy makers in Pakistan who want to reduce poverty should ensure high and sustained economic growth and investment, and must not allow the prices to rise beyond a certain limit. However the empirical result for the fourth factor, i.e., trade openness, must be interpreted and dealt with cautiously. The result shows that trade openness has increased poverty in Pakistan. This may be due to unfavorable balance of payment and worst terms of trade for Pakistan. To overcome all the trade relevant imbalances, Pakistan must have to make its products more competitive in international market. For this purpose, Pakistan must have to improve the quality of its products and lower the cost of production. Only then one can hope that trade openness would contribute towards income and employment generation and thus poverty reduction in Pakistan.

REFERENCES

1. Lopez, J. Humberto, 2004. Pro-growth, pro-poor : is there a tradeoff?. Policy Research Working Paper Series 3378, The World Bank.
2. Rodrik, D., 2005. Rethinking Growth Strategies. WIDER Perpectives on Global Development. Basingstoke: Palgrave-Macmillan in association with UNI-WIDER.
3. Chani, M. I., Pervaiz, Z & Chaudhary, A. R., 2011. Determination of Import Demand in Pakistan: The Role of Expenditure Components, Theoretical and Applied Economics, 18(8), 93-110.
4. Hunjra, A. I., Azam, M., Niazi, G. S. K., Butt, B. Z. Rehman, K. U. and Azam, R. I., 2011. Risk and Return Relationship in Stock Market and Commodity Prices: A Comprehensive Study of Pakistani Markets, World Applied Sciences Journal 13 (3), 470-481.
5. Agenor, Pierre-Richard & McDermott, C John & Prasad, Eswar S, 2000. Macroeconomic Fluctuations in Developing Countries: Some Stylized Facts. World Bank Economic Review, Oxford University Press, vol. 14(2), pages 251-85.
6. Loayza, Norman V., 1996. The Economics of the Informal Sector: A Simple Model and Some Empirical Evidence from Latin America. Carnegie-Rochester Conference Series on Public Policy, Vol. 45.
7. Barro, Robert J., 1990. Government Spending in a Simple Model of Endogenous Growth. Journal of Political Economy, 98, s103-s25.
8. Choi, Sangmok, Bruce D. Smith, and John H. Boyd, 1996. Inflation, Financial Markets, and Capital Formation. Proceedings, Federal Reserve Bank of St. Louis, issue May, 9-35.
9. Bruno, M., and Easterly, W., 1998. Inflation Crises and Long-Run Growth, Journal of Monetary Economics, 41, 3-26.
10. Sarel, M., 1996. Nonlinear Effects of Inflation on Economic Growth. IMF Staff Papers, 43, 199-215.
11. Gylfason, T., 1998. Output Gains from Economic Stabilization, Journal of Development Economics, 56, 81-96.
12. Easterly, W., 1993. How Much Do Distortions Affect Growth?. Journal of Monetary Economics, 32, 187-212.
13. World Bank, 2001. World Development Report 2001: Attacking Poverty. Washington DC: The World Bank.

14. Dollar, D. and Kraay, A., 2002. Growth Is Good for the Poor. Journal of Economic Growth, 7(3), 195-225.

15. UNDP, 2003. Human Development Report. New York: United Nations Development Programme.

16. Agénor, P. R., 2004. The Macroeconomics of Poverty Reduction. Centre for Growth and Business Cycle Research Discussion Paper Series 43, Economics, The Univeristy of Manchester.

17. Adams R. H. Jr., 2004. Remittances and Poverty in Guatemala. World Bank Policy Research Working Paper 3418, Washington DC: The World Bank.

18. Dollar, D., 2005. Globalization, Poverty, and Inequality since 1980. The World Bank Research Observer, 20(2), 145-175.

19. Chani, M.I. and Chaudhary, A.R., 2010. Import Demand Behaviour in Pakistan: An Empirical Analysis. Saarbrücken, Germany: LAP Lambert Academic Publishing.

20. Agénor, P. R., 2005. The Macroeconomics of Poverty Reduction. Manchester School, 73(4), 369-434.

21. Kirkpatrick, C. and Jalilian, H., 2005. Can Financial Development Contribute to Poverty Reduction in Developing Countries?. Journal of Development Studies, 41(4): 636-356.

22. World Bank, 2005. World Development Report 2005: A Better Investment Climate for Everyone. Washington DC: The World Bank.

23. Bourguignon, F., 2006. From income to endowments: The difficult task of expanding the income poverty paradigm. In D. B. Grusky & R. Kanbur (Eds.), Poverty and inequality (pp. 76–102). Stanford, CA: Stanford University Press.

24. Ng, S. and Perron, P., 2001. Lag Length Selection and the Construction of Unit Root Test with Good Size and Power. Econometrica, 69(6), 1519-54.

25. Harris, R. and Sollis, R., 2003. Applied Time Series Modeling and Forecasting. West Sussex, England: Wiley & Sons Ltd.

26. Pesaran, M. H., Shin, Y. and Smith, R. J., 2001. Bounds Testing Approaches to the Analysis of Level Relationships. Journal of Applied Econometrics, 16(3), 289-326.

27. World Bank, 2010. World Development Indicators (WDI) Online Database. Washington D.C., USA: The World Bank.

28. Pervaiz, Z. and Chaudhary, A.R., 2010. Class Division, Social Cohesion and Economic Growth: An Empirical Investigation. Saarbrücken, Germany: LAP LAMBERT Academic Publishing.

29. Banerjee, A., Dolado, J. and Mestre, R., 1998. Error-correction Mechanism Test for Co-integration in Single Equation Framework. Journal of Time Series Analysis, 19(3), 267-283.