

Article**IMPACT OF INFLATION ON ECONOMIC GROWTH IN PAKISTAN****Muhammad Imran***

Research Scholar, School of Economics, International Islamic University, Islamabad, Pakistan

Nasir Ali

Research Scholar, School of Economics, International Islamic University, Islamabad, Pakistan

Nafeesa Kanwal

Lecturer, Department of Economics, University of Kotli, Azad Jammu & Kashmir, Pakistan

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Abstract: *This study examines the relation between inflation and economic growth of Pakistan and to explore if there is a long or short-term relationship between the both. For this purpose, the study used annual data of the period between 1973 to 2014 collected from the World Bank for Pakistan. In this study, GDP is taken as dependent variable, inflation as an independent variable and population as a control variable. To check relationship among the variables, different econometric techniques such as augmented dickey fuller and Philips Perron tests of unit root were applied to check whether the data is stationary or nonstationary and to find the order of integration of the variables. Also, an ARDL approach of co-integration on the variables of GDP, inflation and population was used in order to check the relation among variables. The obtained results show a long-run relationship between inflation and economic growth in Pakistan.*

Received: 28th February, 2022**Accepted:** 18th March, 2022**Published:** 31st March, 2022**INTRODUCTION**

Inflation is a very challenging issue in both developing and developed countries and attains the attention of many policy makers and economists. Inflation is the increase in price level that decreases the purchasing power of consumers. Inflation is caused mainly due to two reasons: (I) when there is rise in aggregate demand (AD) called demand pull inflation and (II) when the cost of production increases prices of commodities called cost push inflation Hussain & Malik (2011).

Inflation is a popular research topic from last many years as it bears solid implications on the income and growth of an economy. It also affects tax system by disturbing lending and borrowing decisions. In other words, inflation is the name of currency devaluation or the increase in money supply. Saving and investment are also discouraged due to the higher level of inflation (Saleem et al., 2013). Higher level of inflation also reduces the level of employment in the country (Mahmood et al., 2013). This study reviewed all such situations in the Pakistan economy. High rate of inflation was experienced in the last decades that was in double digits and that higher inflation badly affected GDP growth in Pakistan. However, the inflation rate has now been controlled and reduced to single digit. In the long-run, inflation positively affects the GDP growth of developing countries but in short-run, it negatively affects the growth of GDP (Mallik & Chowdhury, 2001). According to Mohsin et al (2001), when the fix level of inflation is above 1 to 3 percent, it affects the growth rate in the industrial countries and for the less develop countries the minimum inflation rate is 11-12 percent. In many of the studies, single digit of inflation has been recommended for

* Corresponding Author: Muhammad Imran. Email: imran1373540@gmail.com

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the economy of Pakistan (Ayyoub et al., 2011, Hussain and Malik, 2011, Mubarik 2005). The study of Rao and Yesigaty (2015) found negative relation between GDP and inflation in case of Ethiopia. Kasidi & Wakanemela (2013) suggested low rate of inflation for the economy of Tanzania.

The concept of inflation was first given by Philips and the concept of growth was given by Robert Solow in the theory of Economic Growth but the seminal researcher of inflation and GDP growth is Robert Mundell who received noble prize in economics in 1999. There is a strong difference between the ideas about the sign of inflation and GDP growth relationship. In this regard, there are two schools of thought, namely, Monetarists and Structuralists. According to Structuralists, inflation is a basic component for the GDP growth for the economy whereas Monopolists consider inflation as an ability to conclude GDP growth. The study of Mundell (1965) concluded that inflation positively affects capital formation and showed its positive relation with the economic growth (Hussain & Malik, 2011). The basic objective of this work is to verify the impact of inflation on the GDP in the history of Pakistan. To examine the threshold level of inflation, the authors have used time series data and applied different econometric techniques.

LITERATURE REVIEW

A good number of studies constitute the body of literature on the subject area. Mubarik (2005) examined the relation between GDP and inflation, and estimated a minimum level of inflation for Pakistan from the data taken for period between 1973-2000. In his study, GDP growth rate was taken as a dependent variable whereas inflation, population growth rate and investment growth rate were taken as independent variables. OLS and 2SLS techniques were used in the study. Both techniques concluded that 9% minimum level of inflation is suitable for Pakistan below which, it will not be suitable for the economy to grow. The study of Sheikh et al. (2012) reported dynamic relationship between Foreign Direct Investment (FDI) and Gross Domestic Product (GDP) in the economy of Pakistan. The study used a time series data for the period between 1981 to 2010 where GDP was taken as a dependent variable and CPI inflation and FDI as independent variables. Multiple regression model was used to find the relationship among the variables. Results showed a positive relationship between FDI and GDP and a negative relationship between inflation and GDP. This reflected need to attract FDI to increase GDP of Pakistan. Kasidi & Wakanemela (2013) attempted to study how inflation affected GDP growth in Tanzania. An annual data for the period 1990 to 2011 was used in the study. Co-integration and correlation coefficient techniques were used to check the influence of inflation on GDP growth. GDP was used as a dependent variable and inflation was used as an independent variable. Results of the study showed a negative relation between two variables and depicted zero co-integration between them. In view of the findings, the study suggested that low inflation is suitable for Tanzania. Mallik & Chowdhury (2001) studied the effects of inflation on GDP of four Asian countries i.e., India, Pakistan, Sri Lanka and Bangladesh. Annual data for the period between 1974 to 2001 was used in their study where GDP growth was taken as a dependent variable and inflation was taken as an independent variable. Model of error correction and co-integration were used to study the relationship between GDP growth and inflation. The results showed a long-term and positive relationship between the two variables for all four countries under study. In view of this, the study suggested normal inflation as helpful for growth of the economy but the case is otherwise for high inflation. Saleem et al (2013) attempted to determine the effects of unemployment, GDP, exchange rate, fiscal deficit and interest rate on inflation in Pakistan. The study used annual data for the period between 1990 to 2011. Inflation rate was taken as a dependent variable while exchange rate, unemployment, GDP, fiscal deficit and interest rate were taken as independent variables. The study applied regression, co-relation and test of causality to determine the relationship among the variables. The results showed a negative relation among inflation, unemployment and fiscal deficit whereas a positive relation was found between inflation and rate of exchange, GDP and interest rate. In view of this, the study suggested that trade deficit should reduce and that government income must be greater than its spending to control inflation. Barro (1995) studied the effects of inflation on growth of GDP and investment rate. The study used data of 100 countries from the period between 1960 to 1990, where inflation was used as a dependent variable and GDP growth rate and investment were taken as independent variables. Pleasuble instrument was used to test impact of inflation on GDP growth and investment. Results of the study reflected that where rate of inflation increases for 10% in a year, GDP reduces from 0.2% to 0.3%. This shows interdependence of inflation, growth and investment. Faria & Carneiro (2001) studied the effects of high inflation on long and short-run economic growth. An annual data of Brazil for the period between 1980 to 1995 was used in a similar study where inflation was taken as a dependent variable and real-output was taken as an independent variable. A test of unit-root was used to determine this relationship. Results of the study showed that in long run, inflation does not affect real-output whereas in the short run, inflation negatively affects real-output. Rao & Yesigaty (2015) studied the relationship between continuous economic growth and constant level of prices. An annual data for an east African country, Ethiopia was

taken for a period between 1974 to 2012 in their study where GDP is used as a dependent variable and labor force, physical capital, money supply, consumer price index (CPI), human capital development, openness and exchange rate were used as independent variables. Different econometric techniques such as error correction mechanism, causality test, unit-root and ducky filler were used in the study to investigate the relationship among the variables. The results showed a negative relationship between GDP and inflation in long and short run. Umair & Ullah (2013) attempted to determine the influence of unemployment and GDP on inflation in Pakistan. A data from period between 2000 to 2010 was used in the study where unemployment and GDP were used as redressers when inflation was used as regressed. Regression analysis, correlation, ANOVA model and t-test were used as econometric techniques. The study suggested legal fiscal and monetary policies to control inflation. Drukker et al (2005) measured the relation between growth and inflation. Panel data of 138 countries was taken from a period between 1950 to 2000 for the study in which growth of GDP was used as a dependent variable and inflation as an independent variable. A model of fixed effect was used in the study. The model results showed that when the minimum inflation is below the 19% and start to increase, it does not affect GDP growth and where the case is opposite when the initial inflation is greater than 19% and start to increase. Mohsin et al (2001) showed how a fix rate of inflation affects the relationship between GDP growth and inflation. An annual data of 140 countries from a period between 1960 to 1998 was chosen for the study in which change in GDP growth was taken as a dependent variable and income level, population growth, trade terms growth, standard deviation of terms of the trade, investment and the inflation were taken as independent variables. Non-linear least square and conditional least square were used in the study. The findings showed that in the industrial countries when the fix level of inflation is above 1 to 3 percent, it affects the growth rate and for the less developed countries, this minimum inflation rate is 11-12 percentage. In view of this, the study suggested that the inflation level should be in a single digit. Ferdous & Shahid (2013) studied the impact of the increase in the prices of food commodities and increase in inflation in Bangladesh. A secondary data of period between 2000 to 2012 was taken for the study in which the inflation was an independent variable and growth of GDP was a dependent variable. Simple regression technique was applied which showed that inflation makes investment uncertain and saving converts to consumption.

METHODOLOGY

Sufficient data sources and variables are important not only for experimental analysis but also for validness of the research. Data for the study was taken form the World Bank, as a secondary source. An annual data for the period between 1973 to 2014 was chosen for this study. Selection of variables and econometric techniques were purely based on their relative importance to the scope of this work. In this study, GDP has been taken as a dependent variable, inflation as an independent variable and population as a control variable. ADF and PP test are used to find the stationary of the data. ARDL approach of co-integration technique has been chosen for the econometric analysis to check the relationship among the variables. These variables determine the GDP in the economy and also used in previous studies of Ayyoub et al (2011); Chaudhry et al (2013); Kasidi & Wakanemela (2013); Mubrik (2005) and Saleem et al (2013). In Table 1, all the variables are listed with their description/proxy that has been used in this paper along-with the supporting literature.

Variable	Description	Supported Literature
Economic Growth	GDP	Ayyoub et al (2011), Mubarik 2005, Faria & Carneiro (2001)
Inflation	Consumer Price Index	Gudaro et al (2012), Ayyoub et al (2011)
Population	Population	Ayyoub et al (2011), Mubarik (2005)

Table 1

RESULTS

Unit Root Test

Time series data was used in this study. To check the stationary, the authors used graphs and two tests of unit root ADF (Augmented Ducky Fuller) and Phillips Perron. Properties of stationary includes:

- a. Zero mean
- b. Constant variance
- c. Finate and independent co-variance

When the critical value of tau-test is greater than the tabulated value, the null hypothesis of presence of unit root is rejected which means that the data is stationary. Table 2 shows that when the calculated results are significant at 1%, three stars (***), are placed, where the results are significant at 5%, two stars (**) are placed, and where the results are significant at 10% , one star (*) is placed on the calculated value.

Variables	ADF		PP		Order of integration
	Level	1 st difference	Level	1 st difference	
GDP	-0.477186	-3.251715*	-0.488534	-3.217772*	I(1)
Inflation	-3.259416*	-7.272874***	-3.259416*	-7.267756***	I(0)
Population	-3.259416*	-7.272874***	-3.259416*	-7.267756***	I(0)

Table 2

ARDL Cointegration Approach

As the coefficient of inflation shows that, “a one unit increase in price level leads to 4.81 units decrease in GDP”. The coefficients of inflation are negative which show that there is a negative relationship between dependent variables. Population coefficient shows a positive relation with GDP. The results found negative relationship between inflation and GDP, which is in line with studies of Ayyoub et al. (2011); Kasidi & Wakanemela (2013); Saleem et al (2013); Barro (1995); Faria & Carneiro (2001); Rao & Yesigaty (2015) and Umair & Ullah (2013).

On the basis of findings of this study, there is long run relationship among the variables because the value of F-statistics is greater than the value of upper bound as it was found in studies of Mallik & Chowdhury (2001) and Rao & Yesigaty (2015).

$$GDP_t = \beta_0 - \beta_1 CPI_t + \beta_2 POP_t + \varepsilon_t$$

Where;

GDP = Gross Domestic Product

CPI = CPI Inflation

POP=Population

μ_t = Error Terms

$\beta_1 < 0$

$\beta_2 > 0$

Autoregressive Distributed Lag Estimates					
ARDL (1,0,0) Selected based on Schwarz Bayesian Criterion					
Regressor	Coefficient		Standard Error		Ratio [Prob]
GDP(-1)	1.0020		.015682		63.8921 [.000]
INF	-4.81E+09		2.95E+09		1.6216 [.113]
POP	2134.6		803.2598		2.6574 [.011]
R-Squared	.99869				
Testing for Existence of a Level Relationship among the Variables in ARDL Model					
F-Statistic	95% Lower Bound	95% Upper Bound	90% Lower Bound	90% Upper Bound	
77.0951	2.9113	4.0727	2.2941	3.3149	
W-Statistic	95% Lower Bound	95% Upper Bound	90% Lower Bound	90% Upper Bound	
.1242E-5	8.7339	12.2180	6.8822	9.9446	

Table 3

Error Correction Mechanism (ECM)

After finding long-term relationship between the variables, short-term relationship was checked by applying ECM. The value of ECM is positive between 0 and 1 which means that there is no-short term relationship among the variables. So this study found both long run and negative relationship among the variables.

Error Correction Representation for the Selected ARDL Model ARDL (1,0,0) selected based on Schwarz Bayesian Criterion			
Regressor	Coefficient	Standard Error	Ratio [Prob]
dINF	-4.81E+09	2.95E+09	1.6216 [.113]
dPOP	2134.6	803.2598	2.6574 [.011]
ecm(-1)	.0019847	.015682	.12655 [.900]

Table 4

CONCLUSION

This study was conducted to observe the effects of rise in general price level to the overall income of Pakistan. Another aim of the study was to analyze the relationship between inflation and GDP of Pakistan. Here the main focus was to determine whether inflation positively affects GDP or otherwise and whether inflation affects economic progress for a long period of time or short period of time. This paper is based on the annual data taken for a period between 1973 to 2014. The results of the study showed that there is a trade-off between GDP and inflation. The results of the ARDL cointegration approach showed that inflation affects GDP growth for a long period of time. High rate of inflation is not suitable for the economy but a low or single digit inflation is beneficial for the economic growth of Pakistan. On the basis of these findings, the relevant policy makers are recommended to keep inflation to a single digit to boost up the economy.

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