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Nexus between Inflation, Unemployment, and Economic Growth of Pakistan

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ABSTRACT

This research study is about the impact of two major economic vices namely inflation and unemployment on the economic growth in Pakistan. The research study brought to light the varying effects of both variables on economic growth in different time eras. The researcher has chosen data on the Pakistan economy ranging from 1972 to 2021. The data has been sourced from authentic sources like WDI, IFS, and different issues of Pakistan economic surveys. The significance of the research study was in throwing light on the prevailing scenario where Pakistan is faced with multiple challenges both internally and externally. The study has adopted the Augmented Dickey-Fuller technique for checking stationary, the ARDL approach for checking long-run and short-run relationships, and the CUSUM and CUSUMSQ tests for stability of the coefficients.

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1. Introduction

Pakistan's economy has experienced various fluctuations and structural changes in the country since its independence in 1947. These fluctuations and missed growth targets have confirmed the need to address the giant issues that pose a challenge to a sustainable growth pattern. Hereby among various other economic vices, inflation and unemployment are the issues of major concern like other developing countries. Inflation and unemployment are considered as key issues in any economy as they are pondered upon to be kept at low levels, preferably at single digits in order to ensure the stability in macroeconomic policies which in turn may lead to the achievement of development and growth aims. Inflation and unemployment are such significant variables that they are considered not only in economic decisions and policy making rather, they are the major subject of both social and economic concerns of almost all countries worldwide. These two factors are used to assess the poverty levels in developing countries which are accordingly encouraged to enhance their production to set back inflation and unemployment. The increase in goods and services will boost up the standard of living thus creating confidence and harmony within the economy. Thus inflation and unemployment are the crucial indicator and determinants of growth and development as well.

The word inflation means a persistent rise in inflation. Balami (2006) defines inflation as the rising price level of broad spectrum of goods and services and measured according to the increase over a specific time period. Pakistan's economy is also faced with this macroeconomic problem. From the late fifties till 2021, inflation in Pakistan rated on average 7.90 percent, such as given by The Pakistan Bureau of Statistics (PBS). Inflation and unemployment, Rehman, Cismas, and Milin (2022) two most important issues confronting

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many countries today. The Inflation rate has been reported to be 9.41% for the year 2021, which is not the lowest rate for the past thirteen years. Needless to say, the relationship between inflation and economic growth has given rise to prolonged discussions. Some economists agree that low inflation rate is related to economic growth in a positive way. High and volatile inflation's economic costs are agreed upon by majority of policymakers and economists. Negative externalities are associated with inflation as far as efficiency of the economy is concerned. Variability of prices through inflation can lead to misconception about the profits associated with investment decisions. This causes a narrow approach towards the investment decisions and a prevailing uncertainty causes low levels of investments and hampering economic growth.

Inflation also affects the balance of payments position of an economy. Domestic inflation makes a country's exports expensive and the exports may lose the competition at the international markets. Inflation can also influence the lending and borrowing decisions. Due to inflationary tendencies, the firms have to face the problem of devoting extra funds for a more close observation of the prices offered by the rivals. Earlier the theories regarding inflation and growth were based on trend observations because the inflation was not persistent in nature and a session of inflation was headed by a session of deflation. Inflation behaved lazily and it did not showed some trend movements. Inflation retained its particular position and shifted that position in response to a particular change disturbance. The economists therefore conceived a positive relationship between inflation and economic growth. After World War II, the concept of persistent inflation was highlighted.

2. Theoretical Framework

2.1 Classical Economists

Adam Smith, a Classical theorist introduced a growth model which is affected by the supply side. And this model gave a way to other classical theories. His model is presented as,

$$Y = f\{L, K, T\}$$

Hence,

$$gY = f\{gL, gK, gT)$$

Some derivation from Smith's model indicated that model will show a self-sustaining growth as the relation depicts an increasing returns to the scales. The competitions among entrepreneurs will raise the wages and thus profits may face a decline.

2.2 Keynesian Model

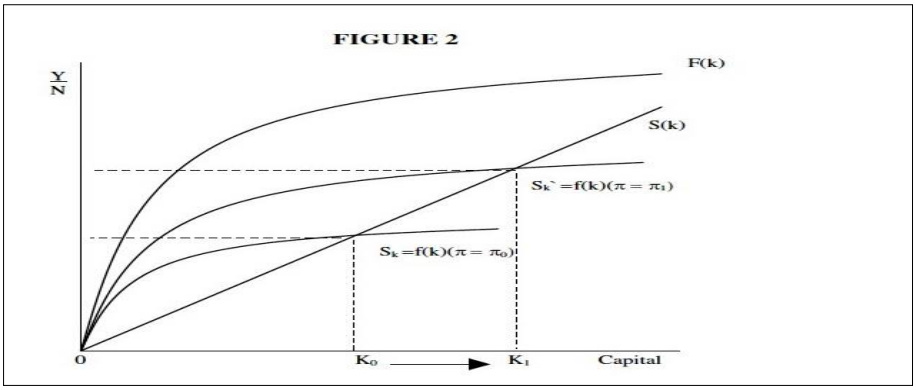
However, the Traditional Keynesian model incorporates aggregate demand and aggregate supply. This AD/AS model clearly establishes and explains the inflation growth relationship. In case of short run, the Keynesian aggregate supply curve slopes upward and in long run it becomes vertical. When an economy moves from short run to long run in Keynesian model, the variations in the other economic agents as mentioned above, balance out each other (Keynes, 1937). And thus an economy reaches a steady state where nothing changes abruptly. The dynamics of AS and AD curve give rise to an adjustment path, which is shown in the figure. This happens because the producers might conceive that only they are producing the high price output and other producers are offering at the same price. Thus they, not knowing about the rise in overall prices, continue with their production and thus output rises. Hence, in the presence of rising prices, there will be no decline in the output.

2.3 Neo-Classical approach

Solow and Swan in 1956 presented the neo classical model regarding growth. This model showed a constant returns to scale for both factors i.e., labor and capital. But a decreasing returns to scale when dealing with them solely. In their model, the growth of capital or investment was replaced by technological improvements. Mundell model takes into account people's wealth to show the effects of inflation. It operates on the ground that when individual real money balances yield low returns, in order to reach the desired level of wealth, people tend to save more. They may revert to assets, and hence the prices of the assets may rise and real interest rate may fall. According to this model, greater savings imply more capital

accumulation and thus output growth is accelerated. Tobin known as a neoclassical economist, in 1965 made some developments in Mundell's model further by following Solow and Swan.

Figure 2



Reference figure 2, the portfolio mechanism has been presented. Here if the inflation rate increases from π0 to π1. The return on money decreases. Tobin states that in this case people will react to low return on money. And capital formation will be preferred. This action on the part of the consumers will shift the capital function shown by the line Sk to Sk'. This shift raises the steady stock of capital level from K0 to K1. Tobin's analysis shows that an upward change in inflation rate raises the output level permanently. However, there is a temporary effect on the growth rate of output which occurs during the capital transition from K0 to K1. The inflation has been stated here to behave like a lazy dog and it affects the capital accumulation and higher growth up to the level until the return on capital falls. After that the high investments will not happen and only a steady state growth will be there. However the growth will take place when a technological improvement will shift the F(k) curve. This shift is caused by the technological advancement and not by the variations in the inflation rates. This also shows that according to neo classical the growth is affected by the exogenous factors.

Precisely stating, the Tobin effect states that consumers tend to go for interest yielding assets due to inflation. In later work by neo classical, Sidrauski (1967) put forth the concept of super-neutrality of money in his infinitely lived representative agent model. Super-neutrality means that the real variables are independent of the changes in the supply of money.

2.4 Neo-Keynesian Approach

Neo-Keynesians introduced the concept of potential output. This concept is also known as the natural output. This level of output is defined as the level of output that is possible when the economy is operating at its optimal level of production.

2.5 Endogenous Growth Theory

The endogenous growth theories are meant to explain the economic growth caused by the agents of a production process. This may include economies of the scale, technological changes etc. The endogenous growth theory depends on the rate of return on capital. The neoclassical economics and endogenous growth theory are different from each other in the sense that in neoclassical theories, capital accumulation yields low returns. But in the endogenous growth theory, the rate of return on capital does not fall below a particular level.

2.6 Inflation, Growth and Central Banks role

Now a day, it is commonly agreed that inflation is a monetary phenomenon. Previously, the monetary influences were considered as some exogenous factor. But currently it is believed that a permanent increase in the money supply causes inflation. This further gives way to the other argument that the limited growth rate of money can ensure price stability in the long run. However, practically the policy makers allowed for money growth rates to exceed the real growth rates of the economy. The monetary trend for past two decades has been the achievement of price stability. In response to this pricy stability oriented monetary policy, the real targets like GDP growth rates and unemployment rates are subsided. These goals are either ignored or postponed in the priorities of the monetary authorities. And they become the concern when the primary aim of price stability has been achieved. The proponents of

monetary policy claim that the real economic goals are affected by the actions of central banks in the short run.

2.7 Unemployment:

International Labor Organization (ILO, 2009) defined unemployment as a state of joblessness when people are looking for a job for four weeks and not able to find one. It is measured as the number of people willing, able and ready for the job, but even then they are jobless. Jhingan (2003) measures the unemployed force as a percentage of the labor force. The labor force comprises of people who are on work or those who are looking for work. Unemployment and inflation are considered as the twin problems that define the chronic poverty in developing countries. A general perception is that when economic growth takes place, the economic activity flourishes and employment increases. The rise in employment leads to increase the purchasing power of the people. This enhanced purchasing power increases consumption and aggregate demand and ultimately inflation. However, the appropriate expansion in the productivity can offset inflation. Since the enhanced productivity can ensure the unrestricted supply of goods and services and ultimately giving way to further economic progress and social welfare.

It is quite possible that new opportunities call for different skills as compared with the jobs that have been closed. In that case, it becomes somewhat difficult for the labors to be rehired. Jhingan (2003) has defined economic growth as a process through which real per capita income of a country increases over a specified time period and it is depicted in the increase of goods and services. Precisely, the idea behind the link between unemployment rate and economic growth rate is the growth rate called the potential output. Where potential output is related to the capacity of the economy to produce goods and services. This production is done with the help of available possible resources like capital and labor. Since the level of potential output is dependent upon the available amount of labor and capital, likewise the growth rate of potential output is also dependent upon the rate of growth of both capital and labor. However the contribution of both labor and capital are not bound. The output produced by a particular number of labor increases by an addition to the capital stock. The contribution of both labor and capital improves by the technological progress. The sum of growth in the labor force and increase in the labor productivity gives the growth of potential output. The factors that determine the growth rate of labor contribution may include the labor force participation rate which is the proportion of population that is in the working age, population size, employed labor force and the number of hours worked by the employed force. And thus labor is finally measured in terms of hours at work. As the number of hours worked by the labor force are not subject to major changes. And it is the size of the population and its employed proportion which determines the contribution of the labor force to the total output.

The economic capacity to produce goods and services is almost fixed in short run. Hence the fast pace of economic growth causes incomes to rise and unemployment rates to fall. But facts show that unemployment rates can fall up to a limit without touching the pace of inflation. In case of long run, the policies can be pursued with the goal of expansion in the productive capacity, which in turn may raise the growth rate of economic growth which is consistent with some stable rates of inflation. Pakistan's GDP averaged 4% since its independence till date (Khalid, 2005). GDP growth rate in Pakistan peak rate 10.22% in 1954 and an alarmingly low to-1.80% in 1952. GDP growth rate for 2016 has been 4.71% against the projected rate of 5.5%.And the projected growth rate for the previous fiscal year was 5.7% as reported by Pakistan Bureau of statistics.

Unemployment and Inflation happen to be the serious issues in a country like Pakistan because the lower inflation and unemployment rates do not coincide with high economic growth rates. And hence the witnessed growth in Pakistan seems to follow an exclusive growth pattern.

In Pakistan, the economic performance has not been outstanding. The economic crisis coupled with political instability has always given ways to further setbacks. The negative effects of high levels of unemployment and inflation cannot be summed up. Instead of being a source of stimulation for growth, the unemployed bulk and inflationary tendencies can pose a threat to economic wellbeing and growth targets can be missed. The present study has a purpose to focus on the following objectives as it plans to;

- Examine the impact of inflation and unemployment on economic growth in Pakistan.
- Find out both the short run and long run association among variables.

3. Overview of Literature

A significant literature is available on the issues pertaining to inflation and unemployment. The relationship of inflation and unemployment and their effect on economic growth has been controversial and different economic studies have given different results leaving space for further analysis. Nurdiana, Hasan, Arisah, Riesso, and Hasanah (2020) explained many influential factors with poverty on the economic growth. In these studies explained the inflation, unemployment on the economic growth. It was stated that Strong economic development do not contribute in reducing the poverty in the absence of income equality. Ademola and Badiru (2016) have checked the impact of unemployment and inflation on economic growth in Nigeria by taking into account the Nigerian economy for a period from 1981 up to 2014. They have introduced inflation and unemployment as indicator and determinant of economic growth. This study notices that Nigerian economy has remained underdeveloped irrespective of the growth rates declared every year. According to the researcher, the Nigerian economy is abundant in human and natural resources but the economic performance of the country is not impressive up to that mark.

The projected growth rate of Nigeria in 2015 has been given as 5.5%. The researcher calls the growth trend in Nigeria as exclusive type of growth. The low per capita income and high inflation and unemployment rates call for the serious steps. According to this study, the Nigerian government has adopted various policies to achieve certain targets and removal of certain economic vices but the results have been disappointing. And the government intervention has not proven to be a good option. Yelwa, David, and Awe (2015) in their research study titled, Analysis of relationship between inflation, unemployment and economic growth in Nigeria, have also considered inflation and unemployment as the determinants of underdevelopment in any nation. This research work provides an analysis of relationship between inflation, unemployment and economic growth. According to this research work, the economic performance in Nigeria has been subject to a down fall due to a number of reason including, inflationary pressures, deteriorating balance of payment position, high exchange rates etc. In the labor market, the high unemployment and underemployment, poor working conditions and low wages and a persistent high inflation have been the recurring features of Nigerian economy. And the situation depicts that labor surplus has not been employed to its best.

The result of Durban Watson test shows that model is meaningful but chances of white correlation has been found which are dealt in short run estimates. In estimation of the short run estimates, the methods from general to specific have been adopted and the results have shown that unemployment is related to economic growth positively and significantly but inflation is related to economic growth negatively and significantly. In order to check the stability of the estimates, the cumulative sum of recursive (CUSUM) and cumulative sum of square of recursive residuals (CUSUMSQ) has been used. The results have shown that the coefficients are stable over the sample period and thus the coefficients are reliable for policy formulation.

The result that inflation and unemployment are positively related to economic growth has been used by the researcher to recommend some policy measures. The positive relationships between these variables show that the growth is exclusive in its nature. It means that this type of growth is not obstructed by the problems like unemployment and inflation. Also such growth does not throw light on the standard of living of the people. Mohseni and Jouzaryan (2016) through their study, titled examining the effects of inflation and unemployment on economic growth in Iran, have studied the economy of Iran. According to this study, the economic challenges of inflation and unemployment have been highlighted by economists in Iran during the previous decade. Many researchers now believe that certain controls on inflation and unemployment are necessary because they play an important part in the economic development. Along with economic growth, the economic development has been given importance in the economic objectives of Iran. And the long run and short run impacts of inflation and unemployment are important to be examined in relation to the economic growth.

4. Contextual Background

This section provides a contextual background of the current study, which created a context for the significance, and the implications of the research study. It describes the situation, which determines the direction for the current research study.

4.1 Unemployment in Pakistan

Among various other economic reasons of unemployment in Pakistan, some social factors are also found to play their part in building the force of unemployed peoples. Malik (2011) has mentioned that about more than 3 million people are educated unemployed in Pakistan. Shahid (2014) has mentioned that unemployment is going up as it increased from 5.6% in 2009 to 6% in 2011. Moreover the female which constitute the big proportion of the population also excel in unemployment at a rate of 8.9% as compared to male unemployment rate which is 5.1% (ILO, 2009).

Zafar (et al 2011) has mentioned that in Pakistan, unemployment is mainly caused by the high population growth rate, which is estimated to be 2.1%. And this enlists our country among the countries with highest population growth rates. Since the resources are not increasing at the competing rate, the mismatched growth of resources and population results in unemployment.

5. Research Design

The research design for the study was to provide a foundation to conduct the research. It would give a detailed description of the methods that were used to find out the answers of research questions. As Trochim (2005), defined research design as it acts like glue that holds the research project together. Since the research design is like a recipe.

5.1 Data Collection

Data collection is the sensitive of all the steps taken in a research study. It is the backbone of the whole structure constructed to test hypothesis. In the present study, the data that was collected and analyzed was secondary data from authentic and reliable sources. The time series data for the present study was taken from authentic sources like WDI data bank, IFS, and different issues of economic survey of Pakistan. The data range has been selected from 1972 to 2021 to incorporate the different economic phases of Pakistan including economic and political unrests and global pressures. Moreover majority of studies conducted on the subject with reference to Pakistan has not included such data range in their analysis. The data has been utilized in order to withdraw the conclusion relevant to the topic and research question. The results have been discussed according to their derivations and no part of the study has been exploited to withdraw the desirable results. The study will be carried out keeping in mind some restrictions. Due to the Budget and time constraints, and scarcity of research resources, it will be limited to Pakistan only. And the reliable methods have been chosen to carry out the analysis so that the chances of misinterpretations and errors are limited and research could be completed within stipulated time.

5.2 Model Specification

The study explains the following model considering the objectives;

$$Y=a+ \beta_1 IR + \beta_2 UN + \varepsilon_t$$

Where, Y is the GDP growth rate, IR is the Inflation rate, the UN is the rate of unemployment and ε_T is the error term. α, β_1, β_2 are the parameters. The model has been derived from the methodology followed by Yelwa et al. (2015) for Nigeria, Saidu and Muhammad (2015) for Nigeria, Mohseni and Jouzaryan (2016) for Iran and Shahid (2014) for Pakistan.

6. Results

6.1 Augmented Dickey Fuller Test

In order to estimate the impact of inflation and unemployment on economic growth of Pakistan, this study first checks the stationary of the data by applying Augmented Dickey Fuller (1981) test to the data. This test checks the unit root problem in the data. The results of this test are given in the table.

Table 1

At Level						At first difference					
Variables	t-statistics	Critical Levels			P*-values	Variables	t-statistics	Critical Levels			P*-values
		1%	5%	10%				1%	5%	10%	
GDP	-5.6115	-3.57	-2.92	-2.59	0.00	**GDP**	-7.57	-3.57	-2.92	-2.60	0.000
Inflation	-3.4723	-3.57	-2.92	-2.59	0.01	**Inflation**	-8.27	-3.57	-2.92	-2.59	0.000
Unemployment	-2.1840	-3.57	-2.93	-2.59	0.21	**Unemployment**	-6.77	-3.57	-2.93	-2.59	0.000

According to the results of Augmented Dickey Fuller test, GDP growth rate has the p value of 0.00, inflation has the p value as .0130 whereas unemployment data has the p value as 0.2145. It means that GDP growth do not have unit root or they are stationary at level form. However, unemployment and inflation are not stationary and is having a unit root at 1% level. Thus H_0 for unemployment and inflation is accepted and it is treated as non-stationary data. We may conclude from the above results that GDP is level form stationary at 1% and unemployment and inflation are first difference stationary at 1% , since after taking first difference of unemployment and inflation, they have become stationary with a p value at 0.000 also its t calculated value is lesser than t tabulated value at all levels of significances. Since the variables are having different stationarity levels, the most appropriate technique to be adopted for the model estimation is Auto Regressive Distributive Lag (ARDL) technique.

6.2 Auto Regressive Distributive Lag Approach

In order to check whether the long run relationship exist between variable included in the model, the ARDL Bound test is applied. This test is meant to check the joint significance of the variables of the model in long run. The results of the bound test have been given in the table.

Table 2: ARDL Bound Test

Test statistics	Value	K	I(0) @ 1%	I(1) @ 1%
F-Statistics	14.23664	2	6.34	7.52

In current model the value of F statistics is14.23664 which is definitely higher than the upper bound values of all levels of significance. This leads to the conclusion that long run relationship exists among the variables.

Table 3: Short Run Relationship:

Variables	Coefficients	Std Error	t-Statistics	Prob
GDP(-1)	-0.031277	0.163604	-0.191176	0.8493
UN	-0.126021	0.165007	-0.763734	0.4494
IN	-0.147031	0.087070	-1.688659	0.0989
IN(-1)	0.004276	0.095781	0.044643	0.9646
IN(-2)	-0.138220	0.074491	-1.855522	0.0707
C	9.996976	2.250455	4.442203	0.0001

The results from the above table depict that coefficient of inflation is negative and insignificant at 5% but significant at 10% and the coefficient of unemployment is negative but also insignificant. This shows that inflation has an insignificant at 5% level, negative relationship with economic growth in our model. Whereas, the unemployment has a negative and insignificant impact on GDP growth in case of short run.

Table 4: Long Run Relationship

Variable	Coefficient	Std Error	t-Statistics	Prob
IN	-0.122199	0.155062	-0.788065	0.4352
UN	-0.272453	0.083312	-3.270259	0.0022
Constant	9.996976	2.250455	4.442203	0.0001

The long run relationship between inflation and economic growth remains negative in the long run but it becomes insignificant whereas the long run relationship between variables like unemployment and economic growth is also negative and significant. The result from the estimates shows that in case of short run inflation and unemployment influence economic growth negatively. But the relationship between inflation and economic growth is insignificant.

The inflation effects economic growth through lag of two time periods. And Unemployment effects the economic growth negatively and insignificantly. Both variables inflation and unemployment prove to be detrimental to economic growth of Pakistan.

The stability of model parameters has been examined applying Cumulative Sum (CUSUM) and Cumulative Sum of Square Of residuals (CUSUMSQ). The CUSUM test is applied to check the systematic variations in the estimated values of the coefficients. And CUSUMSQ is applied to incorporate the unexpected or sudden changes in the stability of the estimated coefficient. If the derived statistics are falling within the boundary lines, the stability of the parameters is confirmed. The CUSUM and CUSUMSQ test estimations for the research work is given as under.

Figure 2: Cumulative Sums (CUSUM) Test

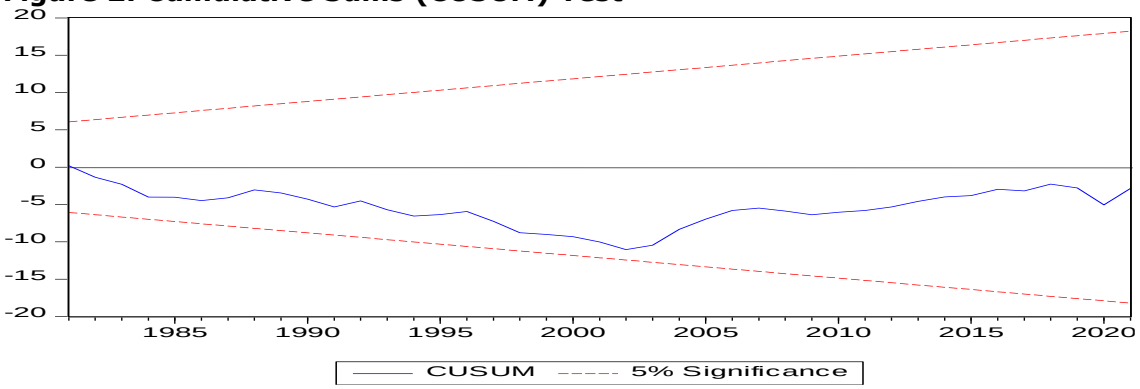
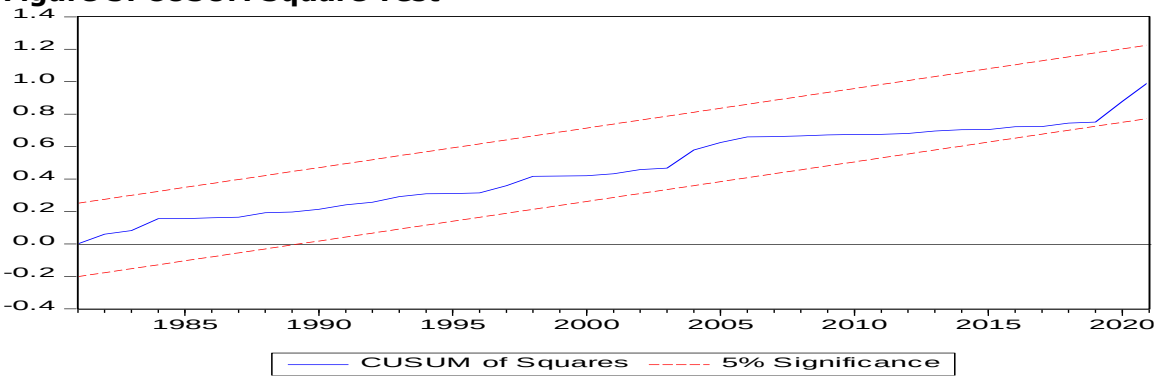


Figure 3: CUSUM Square Test



In both the figures, the plot does not exceed the 5% critical line. This implies that throughout the whole sample period, the stability of the coefficients is confirmed. The estimates are reliable and can be relied upon for policy formulation.

7. Conclusion

This final chapter presents the contribution of key findings made in the field of the current study of measuring the impact of inflation and unemployment on economic growth in Pakistan. The chapter includes limitations of the study the observer faced during the fieldwork. In the end, there are some directions for future research. The key findings from the study reveal that if inflation persists for longer time, it may affect economic growth significantly. However, unemployment is of major concern as it negatively and significantly effects economic growth even in case of short run. This study may add to the existing literature on the issues like inflation and unemployment and their impact on the economic growth. The study has incorporated the data from different economic periods from the history of Pakistan. And it has dug out the unemployment issue to be effective even in the short run and inflation to have significant impact in the long run. In the current scenario, when economic face of the whole globe is changing, it is crucial to find out the issues that are hampering the economic activity.

Though the research study has been carried out by applying reliable tools and test but still there are a number of reasons that simple data analysis might be misleading. This may be because; a researcher may not control all the other factors that may be involved in casting influence on economic growth. It is quite possible that a different type of relation between inflation and growth exists. But, that could not be established because the economic growth

may simultaneously be affected by other factors. If somehow the effects of other factors are set to zero, then a different inflation-growth relation may be possible. Secondly, the research has not incorporated reverse causation. Based on the outcome of this research, certain directions are found for further researchers. The need to deal with data with most advanced techniques of estimations. The up to date data on the day to changing economy having changing political and economic trends and global standings may entail more fine results. Moreover the future researchers may incorporate more variables to find out the impact in the presence of certain other constraints. The research recommends encouraging the options pertaining to self-employment and SME to overcome unemployment. Political stability is a must for sound economic performance. Population growth rate needs to be checked and controlled. Policy should be devised for dealing with persistent inflation.

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