



Research Article

TESTING PHILLIPS CURVE IN PAKISTANHafsa Khan¹, Pooja Pohwani²¹ Shaheed Zulfikar Ali Bhutto Institute of Science and Technology (SZABIST), Hyderabad² Shaheed Zulfikar Ali Bhutto Institute of Science and Technology (SZABIST), Hyderabad*Corresponding Author email: pooja@hyd.szabist.edu.pk**Article History**

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ABSTRACT

Pakistan has usually faced a high inflation rate along with the high unemployment rate since its inception. In every discussion of inflation and unemployment, one cannot ignore the contribution of Dr. Alban William Housego Phillips. Dr. A. W Phillips has done a remarkable contribution in the field of economics with his popular theory known as The Phillips Curve. Empirical Literature of Pakistan has a good portion of researches on inflation rate and unemployment rate discretely, but very few researches focus to find out the exhibition of Phillips Curve in the economy. Therefore, this study aims to find out the impact of inflation on unemployment rate and growth rate of gross domestic product of Pakistan. As aforementioned statement suggest, the independent variable of the study is inflation rate while the dependent variables are unemployment rate and growth rate of gross domestic product. The data range selected was of 20 years that is from 1991-92 to 2019-20. Results were extracted by using three test of EViews software that are, Augmented Dickey Fuller test, Granger Cointegration Test and Johansen Cointegration Test. Findings showed that there is an impact of inflation rate on unemployment rate and gross domestic product growth rate of Pakistan. In short, there can be seen a reflection of Phillips Curve in Pakistan.

Keywords:

Phillips Curve, Inflation Rate, Unemployment Rate and Gross Domestic Product

Abbreviations: NIL

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INTRODUCTION

It is generally thought that inflation is always bad for an economy, however, this was proved wrong by a study conducted by Alban William Housego Phillips, also known as A.W. Phillips or Bill Phillips. Dr. A.W Phillips belonged to New Zealand and was an Economics Professor at the London School of Economics. He is famous for his research which showed that there is an effect of the rate of inflation on the unemployment rate of any country, commonly called the "Phillips Curve." This study gave a theory stating an indirect association between the two mentioned variables and it concludes that whenever there is a rise in inflation, it creates employment opportunities in return and there is an upsurge in the economic growth of that country and vice versa. And since there is an indirect relationship between the variables, the graph of inflation and unemployment is always downward sloping.

PROBLEM STATEMENT

High Inflation has been a perennial issue and has shown an incessant rise in Pakistan. Inflation is considered to be a general rise in the price level. High inflation has deteriorating effects on the lives of the poor, especially those belonging to the

lower and middle class. Abel et al. (2013) threw light on the effects of inflation when it reaches an extremely high level where prices change constantly; the economy suffers and functions poorly. In Pakistan, also, inflation has waned the purchasing power and employment opportunities for people.

PURPOSE OF THE STUDY

Recently, Pakistan is facing both a high inflation rate as well as a high unemployment rate; therefore, this study was directed to probe the actuality of the Phillips curve in Pakistan. The inflation rate is the independent variable while the unemployment rate and Gross Domestic Product (GDP) are the dependent variables of this dissertation. To conduct this research, the data studied to gather the material for this purpose is of 20 years that is from the fiscal year 1991-2019. The models used to find out the result are two famous Co-integration tests of Eviews software, called Johansen Test and Engle-Granger Test.

OBJECTIVES

- Studying the applicability of Philips curve in our economy.
- Identifying the effect of Inflation rate on the Unemployment rate.
- Studying the effect of Inflation rate on Economic Growth.

RESEARCH QUESTION

- Is Philips curve theory applicable in the economy of Pakistan?
- Is there a significant impact of the inflation rate on the unemployment rate in Pakistan?
- Is there a significant impact of the inflation rate on the economic growth of Pakistan?

LITERATURE REVIEW AND HYPOTHESES BUILDING

Mangnejo et al. (2020) did a pragmatic study on unemployment and inflation in Pakistan to find the trend and relationship between the variable by gathering time-series data from the year 1991 to 2015. And To check if the Philips curve shows existence in Pakistan, they tested the data with the help of EViews software. The results of this study bore the presence of the Philips curve in Pakistan.

Abu (2019) researched Nigeria to assess the hypothesis of the Philips curve, and examine the balance between inflation and unemployment alongside its stability. The data was tested the form year 1980-2016 by applying the various test, which includes; Autoregressive Distributed Lag (ARDL), Fully Modified Ordinary Least Square test (FMOLS), Dynamic Ordinary Least Square (DOLS), and Canonical Cointegrating Regression (CCR). The results of this study showed an association between inflation and unemployment. The findings also revealed that in the long-

run more unemployment leads to lower inflation. The research recommended having policies that reduce both inflation and unemployment.

Zayed et al. (2018), studied the Philips curve in the Philippines to assess the inflation rate concerning unemployment, GDP, and yearly pay rate from the year 1950-2017. The main theme of this paper was to identify the existence of the Philips curve in the economy of the Philippines. To test the relationship between the mentioned variable an OLS (Ordinary Least Square) model was developed alongside the ADF (Augmented Dicky-Fuller) unit root test to check the stationary state of data. The study resulted in the need for implementation of policy tools by the government of the Philippines concerning GDP and the annual wage rate in such a manner that it positively influences the inflation and unemployment rate of the Philippines.

Zulfiqar (2014) did a study to analyze the applicability of the Phillips Curve in Pakistan. The study took inflation as an independent variable while the dependent variable was unemployment. To conduct this study the data of the past 30 years was taken into account and Johansen and Juselius' (1990) co-integration technique was used to find out the results. The results of this paper revealed a negative association between inflation and unemployment, and as inflation increases the unemployment also increases in Pakistan.

Gul et al. (2012), research to check the validity of the Philips curve in Pakistan to find out that if inflation and unemployment has a positive relationship or negative relationship. According to their finding, both unemployment and inflation show a continuous rise and the objective of this paper was to highlight the negative impact of it on the economy of Pakistan by taking different variables to check their relationship with unemployment. The results of this paper happen to show a negative relationship between unemployment and inflation.

Furuoka and Munir (2009) checked whether the Phillips Curve existed in selected ASEAN Countries of the world or not. The selected countries were Malaysia, Singapore, Indonesia, Thailand, and the Philippines. To conduct the tradeoff between inflation and unemployment, the data was collected from the year 1982 to 2004. The result showed that there is no balance association between the unemployment rate and the inflation rate in these ASEAN countries.

HYPOTHESES

H01: Inflation rate has no impact on the unemployment rate of Pakistan.

Ha1: Inflation rate has an impact on the unemployment rate of Pakistan.

H02: Inflation rate has no impact on the economic growth of Pakistan.

Ha2: Inflation rate has an impact on the economic growth of Pakistan.

H03: Phillips Curve has no manifestation in Pakistan.

Ha3: Phillips Curve has a manifestation in Pakistan.

METHODOLOGY

THEORETICAL FRAMEWORK



The theoretical framework depicts that economic growth is dependent on the inflation rate and similarly unemployment rate is also dependent on the inflation rate; as suggested by Phillips Curve. In simple words, the given framework portrays the pictorial form of the Phillips Curve and ultimately it represents the objectives of the study.

VARIABLES DEFINED

The unemployment rate is defined as the percentage of the population who is seeking employment but cannot find work (Abel et al. 2013). The next variable is GDP which is used as a substitute for economic growth and it is the monetary value of all final goods and services produces in an economy during a given time period (Report by OECD 2009). Lastly, Inflation is when the general price level is increasing over a given period of time (Abel et al. 2013).

DATA COLLECTION AND DATA RANGE

This study is qualitative research and secondary data-based research as all the data is primarily not collected by the research in fact it is extracted from the Economic Surveys of Pakistan provided on the official website of the Finance Ministry of Pakistan. The data range of 20 years was considered from the Fiscal year 1991-2019.

RESEARCH METHODS AND TESTS

To check the influence of inflation on unemployment and GDP, the Johansen co-integration test and Engle-Granger co-integration test is used. But for determining whether the data is stationary or not, Unit Root Analysis is also used. EViews software is used to extract all the findings.

DESCRIPTIVE AND INTERPRETATIVE ANALYSIS

The results using all the tests are mentioned in the below-given tables and the interpretation of all the tables is also stated.

Table 1: Augmented Dickey Fuller Test for Inflation Rate

Null Hypothesis: Inflation rate has a unit root at a level.	
	Probability Value
Augmented Dickey-Fuller Test Statistics	0.1368
Null Hypothesis: Inflation rate has a unit root at first degree.	
	Probability Value
Augmented Dickey-Fuller Test Statistics	0.0000

Table 1 depicts that the inflation rate has unit root as the p-value of the Augmented Dickey-Fuller Test for the inflation rate. At level is 0.1368 which is greater than the confidence interval value of 0.05. At first degree as the p-value of the test is 0.0000 which is lower than the interval value of 0.05 hence the data is non-stationary.

Table 2: Augmented Dickey Fuller Test for Unemployment Rate

Null Hypothesis: Unemployment rate has a unit root at a level.	
	Probability Value
Augmented Dickey-Fuller Test Statistics	0.3489
Null Hypothesis: Unemployment rate has a unit root at first degree.	
	Probability Value
Augmented Dickey-Fuller Test Statistics	0.0037

Table 2 depicts that the unemployment rate has unit root as the probability value of the Augmented Dickey-Fuller Test. At level is 0.3489 which is greater than the critical value that is 0.05. Hence the null hypothesis is accepted. At 1st degree as the probability value of the Augmented Dickey-Fuller Test is 0.0037 which is lower than the critical value that is 0.05. Hence the null hypothesis is rejected and the data is non-stationary.

Table 3: Augmented Dickey Fuller Test for GDP Growth Rate

Null Hypothesis: GDP Growth rate has a unit root at a level.	
	Probability Value
Augmented Dickey-Fuller Test Statistics	0.0059

Table 3 portrays that the GDP growth rate has unit root as the probability value of the Augmented Dickey-Fuller Test at a level is 0.0059 which is lesser than the critical value that is 0.05. Hence the null hypothesis is rejected.

Table 4: Engle-Granger Co-integration test without unit root

Null Hypothesis: Inflation does not Granger Cause UR	
	Probability Value

Pairwise Granger causality tests Statistics	0.1602
Null Hypothesis: Inflation does not Granger Cause GDP	
	Probability Value
Pairwise Granger causality tests	0.5097

Table 4 shows that the probability value of the null hypothesis “Inflation rate does not granger cause unemployment rate” is 0.1602 which is higher than the critical value of 0.05. Hence, this null hypothesis is rejected, and therefore, it is deduced that the inflation rate has an impact on the unemployment rate of Pakistan.

Table 4 also shows that the probability value of the null hypothesis “Inflation rate does not granger cause GDP” is 0.5097, which is greater than the critical value of 0.05. Hence, this null hypothesis is also rejected, and therefore, it can be summed up that the Inflation rate has an impact on the GDP growth rate of Pakistan.

Table 5 : Johansen Co-integration test

Unrestricted Cointegration Rank Test (Trace)	
Hypothesized no of CEs	Probability Value
None	0.0282
At most 1	0.0348
At most 2	0.0257
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)	
Hypothesized no of CEs	Probability Value
None	0.2636
At most 1	0.1285
At most 2	0.0257

Table 5 shows the results of the Johansen Co-integration Test. The Probability value at a level of trace statistics is 0.0282 which is less than 0.05, hence the null hypothesis is rejected and there is an impact of the Inflation rate on the unemployment rate and GDP growth rate of Pakistan.

Table 5 also portrays the probability value of Max-Eigen statistics which is 0.2636 at level, 0.1285 at 1st degree, and 0.0257 at 2nd degree. Hence the null hypothesis is rejected at 2nd degree; therefore, the results of the Maximum Eigenvalue also denote that there is an impact of Inflation rate on the unemployment rate and GDP growth rate of Pakistan.

FINDINGS:

From the results given in the tables above it can be summed up that there is an impact of Inflation rate (Independent Variable) on the Unemployment rate and GDP growth rate (Dependent variables) in Pakistan. Therefore it can be said that there is a manifestation of the Philips curve in Pakistan during the years 1991-92 to 2019-20. A portrait of accepted and rejected hypotheses is given below;

Hypotheses	Accepted/Rejected
H ₀₁	Rejected
H _{a1}	Accepted
H ₀₂	Rejected
H _{a2}	Accepted
H ₀₃	Rejected
H _{a3}	Accepted

CONCLUSION AND RECOMMENDATION

Considering the current upsurge in inflation, which has shown a devastating effect on the economy of Pakistan, motivated us to carry out research that could study the presence of the Philips curve. All the data extraction was from the Economic Surveys of Pakistan from 1991-92 to 2019-20. Results, from Johansen and Granger Cointegration tests, led us to conclude that there can be seen the presence of the Philips curve and there is an impact of the inflation rate on the unemployment rate and economic growth of Pakistan. This could be because the inflation rate and unemployment rate, as explained by Dr. A. W Phillips, are interlinked; that is an increase in inflation will motivate producers to produce extra output, which requires extra labor and this will eventually reduce the unemployment rate. Similarly, increasing inflation will increase the general price level of the country which will increase the nominal GDP and ultimately economic growth of the country in nominal terms.

This research can be found helpful for policymakers in better understanding the trends and impact of inflation while formulating policies for monitoring and controlling inflation and unemployment rate. It is thus recommended for policymakers to focus and work more in this field of the area to manage the inflation and unemployment with efficacy. As this study showed that increasing inflation can have good impacts on the economy but that must be maintained to a certain threshold as a higher rate of inflation can also affect the other measures of the economy.

References:

Abu, N. (2019) Inflation and Unemployment Trade-off: A Re-examination of the Phillips Curve and its Stability in Nigeria. *Contemporary Economics*, Vol 13 (1).

- Furuoka, F., Munir, Q. (2009) "Phillips Curve" in selected ASEAN countries: new evidence from panel data analysis. *Sunway Academic Journal*, Vol 6, 89-102.
- Gul, H., Mughal, K., Kakar, GA., Hussain, A., Khaliq, S. (2012) Revisiting of Philips Curve; a Case Study from Pakistan. *International journal of business and behavioral science*, Vol 2(6), 53-78.
- Mangnejo, GM., Mahar, SW., Ahmed, B. (2020). Inflation and Unemployment in Pakistan: An Empirical Analysis. *Pakistan Social Sciences Review*, Vol 4(2), 306-318.
- OECD (2010), *National Accounts at a Glance 2009*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264067981-en>.
- Nurul, M., (2018). Testing Phillips curve to examine the inflation rate regarding unemployment rate, annual wage rate and GDP of Philippines: 1950-2017. *Academy of Accounting and Financial Studies Journal*, Vol-22 (5).
- Zayed, NM., Islam, MDR., Hasan, K. (2018). Testing Phillips curve to examine the inflation rate regarding unemployment rate, annual wage rate and GDP of Philippines: 1950-2017. *Academy of Accounting and Financial Studies Journal*, Vol 22(5).
- Zulfiqar, E. (2014). Is there a Phillips curve in Pakistan? A time series analysis. *School of Economics*.