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DETERMINANTS OF UNEMPLOYMENT IN PAKISTAN REVISITED

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ABSTRACT
This paper made an econometric investigation of unemployment scenario in Pakistan for the period 1990-2017. Unemployment is of much concern to policy makers and politicians. GDP growth, population growth, inflation, value added by agriculture and industry and government expenditure were found to be the major causes of unemployment in Pakistan. Positive CPI coefficient reflects stagflation. Prices are increasing but output stagnates that does not lead to fall in unemployment. Population growth contributes enormously to unemployment. Increase in value-added by both agriculture and industry can help reduce the army of unemployed youth coupled with relentless reduction in population growth. Increase in development expenditure is expected to curtail unemployment. Both tests show cointegration among the under consideration variables. OLS results were found to be better than GMM. OLS does not suffer from Endogeneity problem and hence OLS estimation results are reliable. Unemployment could be combated if both agriculture and industry contribution to GDP is enhanced.

KEYWORDS
Pakistan, unemployment, economic growth.

JEL CODES
E10, E24, J60.

1. INTRODUCTION
Macroeconomics has several goals. Low unemployment and price stability are the major objectives. It is less likely that the both are achieved simultaneously, keeping in view the famous and well known inflation- unemployment trade-off. Exploding population growth and poor macroeconomic performance seem to be the principal causes of unemployment in any country particularly developing countries where population growth knows no bounds. Population growth situation in Pakistan is alarming.

Unemployment is a situation when an able bodied person is searching for a job but is unable to get even at the prevailing market wage rate. The costs of unemployment are not less worrying than inflation. Fall in the production of the economy is the principal disadvantage of unemployment as the unemployed workers do not contribute positively to the production. Since the unemployed do not pay taxes, tax-payers also bear the brunt of some of the output cost of the unemployed (Afzal & Awais, 2012). According to GOP (2010-11) unemployment is a state in which individuals are able and also willing to work at the current wage rate prevailing in the market, but they are unable to find any job. It is an observable fact. Unemployment increased in 1990s due to low economic growth rate, fiscal tightening, and several other issues in Pakistan.

Pakistan is basically an agrarian country. Several fundamental causes of unemployment in agriculture sector are backward status, lack of agricultural education, less quantity use of fertilizers, low quality seeds and pesticides, and decreasing demand for manual work due to improvement in technology. These factors are responsible for general and disguised unemployment in the agriculture sector. Disguised unemployment is that type of unemployment where people are seem to be working but actually they are not participating in the productive activity or rightly say that their marginal productivity is zero (Cheema & Atta, 2014).

Having lack of absorption capacity, unemployment has been the major issue in developing countries. The high unemployment rate in South Asian countries is one of the main issues that distinguish them from those of the developed economies. The excessive rate of unemployment negatively impacts the economy which further causes unstable economic circumstances. The focus of every government is to create employment opportunities through various productive activities, by using all available resources. Increasing rate of population growth is an alarming issue in developing countries including Pakistan. A rapid increase in population raises many socio-economic issues in an economy. Unemployment, for long time period always creates poverty, financial problems, homelessness, increasing crime rate and many other issues including, social isolation, loss of confidence, and self-esteem. All these factors are responsible for the erosion of a healthy society (Maqbool, Mahmood, Sattar, & Bhalli, 2013).

Unemployment is among the major macroeconomic variables that portrays the health of an economy. A high rate of unemployment reflects that people are not earning according to their desire and ability. People who voluntarily do not want to work like retired people, full time students, and children are not included in the unemployed category. In short, unemployment means the state when people who are willing and able to do a work but fail to get the desired job (Aqeel, Qureshi, Ahmed, & Qadeer, 2014).

Keeping in view the vital importance of employment, the objective of this paper is to empirically analyze unemployment situation in Pakistan for the period 1990-2017. Previous studies have addressed the unemployment issue in Pakistan from their own perspective. Conventional variables have been used which do not throw sufficient light on the resolution and gravity of the problem. The present paper is based on well- defined econometric techniques. Therefore, the problem is studied from a much broader perspective to get pragmatic guidelines. Unemployment is an important subject which directly or indirectly creates further economic hurdles. If the available resources are properly utilized in Pakistan, the problem can be taken care of.

2. LITERATURE REVIEW
A lot of literature is available on the subject matter, highlighting various causes and consequences regarding increasing rate of unemployment. Many studies have investigated determinants of unemployment. Some studies used Microeconomic perspective and others considered macroeconomic factors of unemployment. These studies dealt with developed and developing countries. Different theoretical models were used for assessing the determinants of unemployment. The job search model was presented by (Mortensen 1970; Lippman &McCall 1976). According to this model, the unemployment depends on offered job and on acceptance of job. The job offered depends on expertise of labor, education, work experience and the demand condition of labor in local area.

Assaad, El-Hamidi, and Ahmad (2000) empirically examined the various determinants of unemployment in Egypt. The study reported that in the labor market of Egypt unemployment was flourishing with constant rate. Analysis shows that the educated female sector is being affected more than that of male counterparts

by the transition to a private sector economy. The females face domestic issues to enter in the job market, especially in the private sector. The study suggests that there is good policy atmosphere that is appropriate for labor-intensive techniques; exports oriented industries would help to absorb the new applicants into the labor market.

Khan (2002) studied the unemployment among educated manpower in Pakistan. And reported that the educated unemployed are generally located in urban areas, and being young, capable of organizing themselves and belonging to middle class can exert their influence and act as a powerful pressure group. Valadkhani (2003) study examined the major causes of Iran's unemployment and used simultaneous-equation model based on annual data from 1968 - 2000. The study found that the unemployment rate responded positively to output gap and increasing economic uncertainty and negatively to the higher growth rates of real investment and inflation.

Kalim (2003) studied the determinants of unemployment in Pakistan based on unemployment, population growth and real growth rate of GDP for the period 1986-1999 and concluded that population growth rate in Pakistan was extremely high compared to other developing countries. Both low GDP and population growth were the major contributors to unemployment in Pakistan. Akhter and Shahnaz (2005) reported that youth unemployment in Pakistan declined when GDP annual rate of growth was higher than 4.25% per year. The study concluded that the investment in private sector had long lasting impact compared to public sector investment to increase employment opportunities for youth. Micro level data from households showed that vocational training had no positive effect on employment.

Shu-Chen Chang (2005) studied economic growth, trade, foreign direct investment (FDI) and unemployment in Taiwan and applied VAR method of variance decomposition and impulse response function analysis. Study confirmed no relationship between FDI and unemployment whereas negative relationship between unemployment and economic growth was confirmed. Monastiriotis (2006) used Keynesian and monetarist approaches to study unemployment in UK. Theoretically the study shed light on Keynesian and monetarist explanations of unemployment and explained how the two main theoretical approaches perceived the role of price stability, macroeconomic shocks and labor market rigidities for unemployment. Pallis (2006) explained the relationship between inflation and unemployment in new European Union member states for the period 1994-2005.This paper concluded that the application of common policies across an economy was questionable because of the different effect of these policies on inflation and unemployment.

Rafiq, Ahmad, and Ullah (2008) examined the unemployment situation in Pakistan for the period 1998-2008 and concluded that the population growth contributed to unemployment while inflation and FDI had negative impact on unemployment. Kyei and Gyekye (2011) argued that unemployment was one of the most significant determinants of the welfare of any nation.

According to Afzal and Awais (2012) the success of government policies depends on low inflation and low unemployment. Inflation refers to a condition in which the price level is continually rising at a rapid rate. Import prices and fiscal indiscipline were reported as the major causes of inflation. Unemployment resulted from lack of employment opportunities and was a permanent feature of the economy. Unemployment situation in Pakistan got worse due to rapid population growth, uninspiring economic growth, fiscal indiscipline, rising debt-servicing and non- development expenditure which had adversely affected Pakistan economic development and poverty reduction. They argued that if policymakers increased aggregate demand, they may minimize unemployment only at the cost of higher inflation.

Aurangzeb and Asif (2013) studied the macroeconomic determinants of unemployment in Pakistan, India and China for the period 1980-2009 and used inflation, exchange rate, GDP and population as the determinants of unemployment in the said countries. Based on time series techniques like cointegration and Granger causality, study reported diverse results for the sample countries. The study suffers from flaws due to econometrics techniques.

Arsalan and Zaman (2014) studied the key factors responsible for unemployment in Pakistan for the period 1999-2010 and OLS was used based on data on inflation,foreign direct investment, GDP, and population growth and reported negative connection between the afore-said variables whereas population growth had positive impact on unemployment suggesting that population growth contributed to increase in unemployment in Pakistan.Sabir and Naaz (2015) concluded that growth rate of population and literacy rate had significant positive relation with unemployment while GDP had negative impact on unemployment in Pakistan.

3. MODEL AND DATA

MODEL: UNEMPLOYMENT

Unemployment model is developed by assuming that the following variables are expected to have a significant influence on unemployment.

UN=unemployment rate is the ratio of the number of unemployed individuals to the total labor force. Data for unemployment as percentage of total labor force were collected from WDI (2018).

GDP growth (Y_p)

GDP growth measures the aggregate macroeconomic performance of an economy that affects almost all facets of the economy. This also influences the inflation and unemployment in the economy and GDP growth may be construed as the mother of all macroeconomic problems. If it is doing well, it will take care of all conceivable problems. Thus its importance in influencing the unemployment is an open secret.

Population growth (POP_g)

Pakistan has one of the highest population growth rate in the world. Population pressures are threatening land, forests and water resources. The poor bears the brunt of the negative effects of population growth. They become landless, face loss in jobs, and the government reduction of expenditure on education and health. Pakistan was the 13th most populous country in the world with a population of 32.5 million in 1947. Today Pakistan is the 6th most populous country in the world. Except India, China and Indonesia; Pakistan's projected population will far exceed other Asian countries in 2025.Pakistan though ranked 6th in size adds more than twice as many peoples to the absolute growth of world population than USA which ranks third (Afzal & Awais, 2014). The citation clearly reveals that*population growth is the most potential source of unemployment in Pakistan.*

CPI= Inflation

Inflation is a condition of continually and rapidly rising price level that persists over a long period of time. Inflation is anticipated when prices increase at a rate which all economic agents (consumers, workers, investors and firms) expect to rise, or it may be unanticipated, when the increase in prices is not expected or are larger than expected. Excessive government borrowing from the central bank, increase in food and oil-prices, supply –shocks, law and order situation and energy crisis, governance problems were the major problems causing inflation in Pakistan (Afzal & Awais, 2012).

CPS=Value added by industry and agriculture

Value- added by industry and agriculture constitutes the commodity producing sectors (CPS). Agriculture, industry and services are three vital parts of Pakistan GDP. Their share in GDP has varied over the decades. Today industry, agriculture and services share in GDP is 21%, 21.8, and 58.1% (GOP, 2013-14) respectively. Services were not used as additional explanatory variable because its growth is linked with agriculture and, industry growth. If both are performing well, services sector will also grow.

Despite more than 70 years of vigorous industrialization, agriculture is still the mainstay of the economy in terms of its contribution to GDP, employment and foreign exchange earnings. Agriculture also contributes to growth as supplier of raw materials to industry as well as market for industrial products. Not only more than 40% labor force is engaged in agriculture but also it is host to more than 60% rural population which is directly or indirectly linked with agriculture. The performance of these sectors depends on GDP growth because GDP can be taken as an index reflecting the overall health of the economy including political stability as well as official policies having bearing on the growth of these sectors.

Since the very beginning of the country Pakistan has strongly pursued import-substitution industrialization for balance of payments (BoPs) reasons as well as rapid growth and development to reduce dependence on agriculture and foreign countries. Industrial production is used here as an index or measure of the structural change that accompanies the process of growth and development. Moreover, industrial production can be taken as a proxy for the rate of investment in previous years at which labor and capital have been transferred from agriculture and industry (Afzal 2004). Since these sectors have more than 40% share in GDP growth, therefore, agriculture and industry as percentage of GDP are added as another independent variable. It is an open secret of the economic development of a

developing country that the share of agriculture in GDP declines over the years. Therefore, the performance of these sectors has decisive influence on output and employment.

G=Government expenditure

Government expenditure refers to the purchase of goods and services, including both public consumption and public investment, and transfer payments consisting of income transfers (pensions, social benefits) and capital transfer. Government is a big consumer notably in developing countries. Government expenditure (G) has significant impact on employment. Unemployment declined in 1990s as the government slashed its development expenditure that added to the unemployment of the army of unemployed youth and poverty. Based on above-mentioned brief explanation the following model of unemployment is proposed:

$\ln UN = \lambda_0 + \lambda_1 \ln Yp + \lambda_2 \ln POPg + \lambda_3 \ln INF + \lambda_4 \ln CPS + \lambda_5 \ln G + \phi$

ln= natural logarithm. Log is used to smooth the data. The expected sign of the coefficients is:

$\lambda_1 < 0,\ \lambda_2 > 0,\ \lambda_3 < 0\ \lambda_4 < 0\ \text{and}\ \lambda_5 < 0$

DATA

Annual data for all variables of the model were obtained from Government of Pakistan (GOP), Economic Survey (1997-98, 2005-06, 2011-12, 20017-18) for the period 1990-2017.

4. EMPIRICAL RESULTS

Model-Unemployment

Dependent variable: lnUN

TABLE 1: METHOD: FULLY MODIFIED LEAST SQUARES (FMOLS)

Variable	coefficient	Std. Error	t-Statistic	Prob.
lncpi	0.04	0.09	0.44	0.66
$\ln y_p$	-0.03	0.03	-1.03	0.31
lnpopg	0.02	0.13	0.17	0.86
lncps	1.46	0.84	1.74	0.09
lng	-1.12	0.17	-6.42	0.000
C	-1.51	3.68	-0.41	0.68
R^2	0.52	Ad.R^2	0.41	DW= 2.02

The results of unemployment model (Table 1) are not according to expectations. CPI coefficient is positive and insignificant suggesting that increase in inflation increases unemployment rate. This is against the traditional inflation- unemployment trade-off. Positive CPI coefficient reflects stagflation that is there is inflation and stagnation. Prices are increasing but output stagnates that does not lead to fall in unemployment. GOP statistics show that economy has not been performing well leading to fall in unemployment.

Increase in economic growth (yp) will help reduce unemployment. During the current decade economy has not been performing well. During 2012-17, GDP growth rate was not enviable. Both agriculture and manufacturing sectors did not follow desirable pattern. Exports recorded negative growth leading to huge external debt and depreciation of the exchange rate (GOP 2016-17). Therefore, unemployment has followed an increasing trend.

Population growth has the expected positive sign but has insignificant coefficient. This has assumed alarming proportions over the last decades that are adversely affecting all facets of the economy. Population growth contributes immensely to unemployment because it exceeds more than job opportunities. Rapid population growth has added fuel to the agonizing unemployment situation.

CPS has correct and significant coefficient. Increase in value-added by both agriculture and industry can help reduce the army of unemployed youth coupled with relentless reduction in population growth. This means that increase in economic growth and development is most likely to help reduce population growth. As people become more educated and their standard of living also augments, they will think about family size. Government expenditure has expected negative and significant coefficient. Increase in Government expenditure particularly development expenditure will go a long way to curtail unemployment.

Cointegration

Time-series econometrics focuses on the time-series properties of the economic variables in order to overcome the problem of spurious regression. It is important to see whether the variables are stationary or not. A time series having unit root is called a nonstationary time series. A time series is stationary if mean, variance and covariance are time invariant (Gujarati 2004). Therefore, examination of stationarity/nonstationarity is important before doing any empirical work which is closely linked to the tests for unit roots. Cointegration may provide useful information about the relationship between the nonsatationary variables. The theory of cointegration attempts to study the interrelationships between long-run movements in economic time series. Most economic theories are about long-run behaviour (Maddala, 2001). Therefore, cointegration between two series implies that there exists a long-run relationship between them which suggests that the variables move together over time so that short-term disturbances from the long-term trend will be corrected.

ADF has the following equation:

$\Delta Y_t = \beta 0 + \beta_1 t + \gamma Y_{t-1} + \sum \beta_j Y_{t-p} + \varepsilon_t$

If the computed τ-statistic is less < MacKinnon critical values then we do not reject the hypothesis that $H_0: \gamma = 0$ the given time series has unit root that is it is nonstationary or is integrated of order one. A time series is integrated of order one if it becomes stationary after it has been differenced one time. Now if Ho: γ = 0 is rejected, then first difference stationary is confirmed which means that the original time series is integrated of order one (Gujarati, 2004).

ADF (Table 2) results show that the underlying variables are nonstationary (NS) in first difference though mixed in level form suggesting that the data are examined for cointegration. VAR lag order selection criteria recommends lag 1. Both tests show cointegration among the under consideration variables meaning that there is long-run relationship among the variables.

TABLE 2: ADF TEST - UNEMPLOYMENT MODEL

Variable (log)	Level	First difference	Result
y_p	-3.27 (0.09)	-6.25 (0.0001)	NS
popg	-7.29 (0.0000)	-6.85 (0.0000)	NS
cpi	-1.73 (0.71)	-4.06 (0.0057)	NS
cps	-3.22 (0.10)	-3.67 (0.04)	NS
g1	-1.69 (0.73)	-5.40 (0.0009)	NS

*MacKinnon (1996) one-sided p-values.

Test critical values: 1%level=-4.46,

5% level=-3.46

10% level= -3.26

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TABLE 3: COINTEGRATION RESULTS: (MODEL- UNEMPLOYMENT) lnUN lncpi lny$_p$ lnpopg lncps lng

Null	Alternative	λ-trace	5%CV	λ-max	5%CV
H$_0$: r =0*	H$_1$: r = 1	**124.21***	95.75	56.80	40.07
H$_0$: r ≤1	H$_1$: r = 2	67.41	69.82	24.68	33.87
H$_0$: r ≤2	H$_1$: r = 3	42.73	47.85	19.60	27.58
H$_0$: r ≤3	H$_1$: r = 4	23.13	29.79	14.94	21.13
H$_0$: r ≤4	H$_1$: r = 5	8.19	15.49	5.73	14.26
H$_0$: r ≤5	H$_1$: r=6	2.46	3.84	2.47	3.84

Both tests indicates 1 Cointegrating equation at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

GMM Estimation Results

Different estimation techniques are used to estimate an econometric model. Ordinary Least Squares (OLS) method is the most basic and popular method of estimation. However, this method faces Endogeneity problem. GMM is a general model that estimates parameters in a statistical model. GMM method possesses desirable statistical properties of consistency, efficiency, and asymptotic normality. Moreover, GMM overcomes Endogeneity problem. GMM literature assumes stationarity in the variables of the model.

TABLE 4: MODEL (UNEMPLOYMENT)

Dependent Variable: Unemployment

Method: Generalized Method of Moments

instrument specification: lnun(-1) lnimports lnm2 lner

lnindustry lnbd

Variable	Coefficient	Std. Error	t-Statistic	Prob.
c	-10.82	38.08	-0.28	0.7791
lncpi	0.05	0.36	0.16	0.8738
lnyp	0.04	1.37	0.02	0.9779
lnpopg	3.57	8.57	0.41	0.6804
lncps	-1.01	0.56	-1.80	0.0859
lng1	-1.01	0.56	-1.80	0.0859
ar(1)				
R^2	0.38	Adj R^2 = 0.23	DW= 2.13	J-statistic 0.99(0.32)

Unemployment Model was estimated with FMOLS (Table 1) and GMM (Table 4). FMOLS results are preferable.

TABLE5: ENDOGENEITY TEST: MODEL - UNEMPLOYMENT

Equation: lnun (model-II)

specification: lnun lncpi lnx1 lnpopg lncps lng1 c

instrument specification: c lnun(-1) lnimports lnm2 lner

lnindustry lnbd

ndogenous variables to treat as exogenous: lncpi lnx1 lnpopg

lncps lng1

	Value	df	Probability
Difference in J-stats	2.029058	5	0.8451
J-statistic summary			
	Value		
Restricted J-statistic	3.694052		
Unrestricted J-statistic	1.664994		

Endogeneity test based on Chi-square statistic tests the null hypothesis that regressors are exogenous. Endogenous variable corresponds to the dependent variable while explanatory variables represent exogenous variable (Gujarati 2004). Since H$_0$ has been accepted due to insignificant value by the Endogeneity test for the unemployment model (Table 5) meaning that the regressors are exogenous and it is concluded that OLS estimation results are reliable and mostly preferred to GMM results as OLS and GMM tables demonstrate. Therefore, OLS does not suffer from Endogeneity problem.

7. CONCLUSIONS

This paper made an econometric investigation of unemployment scenario in Pakistan for the period 1990-2017. Unemployment like inflation and investment is an important macro variable which is of much concern to policy makers and politicians. GDP growth, population growth, inflation, value added by agriculture and industry and government expenditure were found to be the major causes of unemployment in Pakistan. The positive CPI coefficient suggests that increase in inflation increases unemployment. Positive CPI coefficient reflects stagflation that is there is inflation and stagnation. Prices are increasing but output stagnates that does not lead to fall in unemployment.

Population growth has had assumed alarming proportions adversely affecting all facets of the economy. Population growth contributes enormously to unemployment because it exceeds the job opportunities. Increase in value-added by both agriculture and industry can help reduce the army of unemployed youth coupled with relentless reduction in population growth. Government expenditure has expected negative and significant coefficient. Increase in development expenditure is expected to curtail unemployment. The fundamental variables are nonstationary (NS) suggesting that the data are examined for cointegration. Both tests show cointegration among the under consideration variables.

GMM estimation was also made in order to compare with OLS results; OLS results turned out to be better than GMM. OLS does not suffer from Endogeneity problem. Therefore, OLS estimation results are reliable.

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