Unemployment Determinants and the Existing State of Philips curve: An Integration of Regional Heterogeneity in South Asia

Khizra Sardar
PhD Scholar, Department of Economics, The Women University Multan,
khizrasardar42@gmail.com
Dr. Hina Ali
Associate Professor Department of Economics, The Women University Multan, Pakistan.
hinaali@wum.edu.pk
Reema Jamal
PhD Scholar, Department of Economics, The Women University Multan, Pakistan.
reemajamal948@gmail.com
M. Inam Makki Khan
Visiting Lecturer, National University of Modern Languages, Multan.
inamk786786@yahoo.com

Abstract

Increasing unemployment has significantly captured researcher attention in the past few decades. Although, the role of the Phillips curve in this regard has also been done, multiple times. But despite this vast scope, some factors are left untouched like the role of improved life expectancy. Similarly, each country differs from another in some manner. Hence, we tried to concentrate on economies that are demographically and geographically similar (but not the same). For this purpose, south Asian Economies are selected that are Bangladesh, India, Pakistan, and Sri Lanka. Researchers disclosed only those determinants who has proven a static role in decreasing or increasing the Unemployment rate. In this research, the impact of some socioeconomic determinants inflation, unemployment, life expectancy, and gross domestic product growth has been taken into consideration. Besides, exchange rates, foreign direct investment, and broad money are also examined. Panel data has been collected from World Development Indicators, over the time frame 1980-2020. For Statistical analysis, a multiple regression approach has been utilized, using SPSS. Results revealed that in Bangladesh, suggests that inflation, foreign investment, broad money, and GDP growth significantly while exchange rate and life expectancy are insignificantly associated with the unemployment rate. Although, in the case of only GDP growth, foreign investment, exchange rate, and broad money are statistically significant. Conversely, in Pakistan, life expectancy, inflation, GDP growth, exchange rate, and broad money has confirmed their statistical significance. While in Sri Lanka, life expectancy, GDP growth, exchange rate, and broad money significantly determine unemployment. Similarly, Panel Regression estimates revealed that life expectancy, inflation, GDP growth, exchange rate, foreign investment, and broad money significantly determines the unemployment rate.

Keywords: Unemployment, Determinants, Life Expectancy, Inflation, Exchange Rate, Foreign Direct Investment, Broad Money, Bangladesh, India, Pakistan, Sri Lanka.

Introduction

The rate of employment is an utmost forecasting indicator or predictor of the growth rate in an economy. It not only tells about employment statistics (no. of employed and unemployed) but also about the economic growth and resource utilization in an economy. Several employed labor increase indicates that the GDP of an economy will surely increase (an increase in labor recruitment raise production activities that in turn raises goods production and economic growth). The core objective of any macroeconomic policy is to attain a high economic growth rate with a low unemployment rate. The high rate of unemployment is not only a major issue of concern at the macro level but also at the micro level.

An increase in the unemployment level influences the life of the masses in an economy greatly. As it influences the life of poor people greatly and significantly. Because of unemployment average income level decreases that cause a reduction in purchasing power parity (PPP), decline in PPP results in a decline in consumption level that in turn generates low demand for available goods and services. Low demand results in a low investment level that in turn reduces production level, GDP and economic growth. A decline in investment again decreases no. of labor employed that in turn again influences consumption, investment and production cycles.

There is a set of types of unemployment defined by economists and researchers. The main types of unemployment include structural unemployment, frictional unemployment, cyclical unemployment, seasonal unemployment, disguised unemployment, voluntary unemployment and involuntary unemployment. Structural unemployment is a type of unemployment that results because of demand and supply disequilibrium. The main cause of this unemployment is foundational problems (inefficiency of labor market forces) therefore, it is called structural unemployment. Fictional unemployment results because of labor circumstances. Compare the estimates of one economy with other economies based on the unemployment rate. Literature shows that numerous macroeconomic and socio-economic variables determine the unemployment rate in the economies of Bangladesh, India, Pakistan and Sri-Lankan economies. Therefore, in this research, unemployment estimates of one economy are compared with others. For comparing estimates multiple regression analysis was applied in this research. Results show varying effects, for example, estimates of Pakistan's economy vary from Bangladesh, India, and Sri Lanka's economies. This research has been grounded on the following objectives:

1. Discover the socio-economic determinants of the unemployment rate for the economies of Bangladesh, India, Pakistan, and Sri Lanka to predict future trends.
2. Determine the long run association between Unemployment, Inflation, and economic growth.
3. Check the prevalence of the Philips curve for the case of South Asian Economies
4. Integrate the contribution of foreign direct investment in reducing unemployment.
5. Suggest Policy implications for combating the problem of unemployment prevailed in four examined economies.

Review of Literature

Srinivasan (2008) documented the unemployment and employment rate since 1970, for the economy of India. The main aim of this study is to examine the prevailing trends of unemployment and employment rates since 1970. And also to analyze the key causes or determinants of unemployment. The study also suggests some policy measures for improving the current unemployment state of the economy of India.

Rafiq, et al. (2008) documented primal determinants of the rate of unemployment. This study considered a time series data estimation over the period 1998 to 2008 for the economy of Pakistan. Results of the study exhibited that there is a long run association between GDP, unemployment, macro-economic stability, exchange rate and inflation rate. Furthermore, estimates gained were confirmed to be statistically significant.

Subhan and Hayat (2008) securitized the impact of price instability on the level of unemployment and economic growth rate. This study considered a time series data estimation for the economy of Pakistan. Results of the study exhibited that there is long run association between GDP, unemployment and price instability. Furthermore, estimates gained were confirmed to be statistically significant. Sundaram (2009) deliberated on the measurement of unemployment and employment in the case of India. This research utilized NSS employment & unemployment surveys (EUS) for gathering data series for empirical estimation. This research paper critically examines the drivable/ derived from EUS estimates or determinants of unemployment for the case of the Indian economy. After examination, the researcher utilized reviewed the information in policy making and planning (Nasir et al., 2022).

Deakin and Sarkar (2011) analyzed labor law and its influence on unemployment. Time series data of the Indian economy over the time of 1970-2006 analyzed. The researcher selected a formal economy for testing labor law's influence on the unemployment rate in the case of India. Results confirmed that pro-labor legislation and laws lead to a decline in the unemployment rate. Furthermore, pro-labor legislation has no hand in raising the unemployment level and industry stagnation. Thayaparan (2014) documented the effect of inflation rate & economic growth on the rate of unemployment. For empirical estimation, this research considered the Sri Lankan economy. This research followed a time series data estimation. Results of the study exhibited that there is a long run association between GDP, unemployment and inflation rate. Furthermore, estimates gained were confirmed to be statistically significant.

Ahmed and Khan, (2015) examined the situation of employment and unemployment in the case of Bangladesh's economy. Results showed slow growth of employment. Therefore, there is a need to consider the policy implications suggested. Moreover, globalization raises the employment level while environmental degradation raises the unemployment level. Tanha (2018) highlighted the impact of Inflation and Growth on the unemployment level in the case of Bangladesh. This research follows a time series analysis from 1991 to 2015. The OLS

results showed that GDP growth and inflation insignificantly co-integrated with unemployment (invalidating Okun's law and validating the Philips curve respectively). Moreover, the age dependence ratio confirms significant results.

Mallick and Biswas (2020) integrated a non-linear mathematical unemployment model. The study discussed how to reduce the unemployment level in Bangladesh's economy. According to estimates by raising employment opportunities (or job vacancies) and by providing skilled labor the economic problem of unemployment can be solved.

Kuchibhotla, Orazem, and Ravi (2020) scrutinized the scarring effects of youth joblessness in the economy of Sri Lanka. The study analyzed the determinants of unemployment among a sample of Sri-Lankan youth who left schooling from 2000 to 2004. Results confirmed a strong linkage between joblessness (unemployment) in the first year after leaving education (school) and subsequent unemployment over the next four years. Moreover, scaring effect ranges from 11% to 16%.

Mazher and Dahalan (2020) demonstrated the role of macroeconomic underlying variables in determining the unemployment rate in the case of Pakistan's economy. Results of regression analysis and ARDL proposed that FDI, population and energy usage significantly cointegrated with the rate of unemployment. Furthermore, the researcher suggested that government and policymakers must consider the environment, FDI and population while forming policies and regulations.

Research Methodology

In this research, six variables are utilized as the stimulus for the rate of unemployment (UNEM) in the case of Bangladesh, India, Pakistan, and Sri Lankan economies from 1980 to 2020. Econometric models utilized by the researcher are listed below with abbreviations concerning Bangladesh, India, Pakistan, and Sri Lanka.

$$UNEM_{it} = \beta_{0it} + \beta_1 FDI_{it} + \beta_2 LFEX_{it} + \beta_3 INF_{it} + \beta_4 GDP_{it} + \beta_5 BM_{it} + \beta_6 EXCH_{it} + e_{it} \ldots(3.1)$$

$$UNEMB_t = \beta_{0t} + \beta_1 FDI_t + \beta_2 LFEX_t + \beta_3 INF_t + \beta_4 GDP_t + \beta_5 BM_t + \beta_6 EXCH_t + e_t \ldots(3.2)$$

$$UNEMI_t = \beta_{0t} + \beta_1 FDI_t + \beta_2 LFEX_t + \beta_3 INF_t + \beta_4 GDP_t + \beta_5 BM_t + \beta_6 EXCH_t + e_t \ldots(3.3)$$

$$UNEMP_t = \beta_{0t} + \beta_1 FDI_t + \beta_2 LFEX_t + \beta_3 INF_t + \beta_4 GDP_t + \beta_5 BM_t + \beta_6 EXCH_t + e_t \ldots(3.4)$$

$$UNEMS_t = \beta_{0t} + \beta_1 FDI_t + \beta_2 LFEX_t + \beta_3 INF_t + \beta_4 GDP_t + \beta_5 BM_t + \beta_6 EXCH_t + e_t \ldots(3.5)$$

Here;

UNEM = Unemployment Rate (total, % of the total labor force)

UNEMB = Unemployment in Bangladesh

UNEMI = Unemployment in India

UNEMP = Unemployment in Pakistan

UNEMS = Unemployment in Sri-Lanka

FDI = Foreign Direct Investment (net inflows, % of GDP)

LFEX = Life Expectancy at Birth (total, years)

INF= Inflation Rate (consumer prices, annual %)

GDP = Gross Domestic Product (current US$)

BM = Broad Money (% of GDP)

EXCH = Exchange Rate (LCU per USS, period average)

i = Panel of Bangladesh, India, Pakistan, Sri-Lanka

t = time period from 1980-2020

e = error Term

Descriptive Measures

Descriptive measurement is used to exhibit the salient features and characteristics of the examined data series. The descriptive measurement table contains the mean, median, and max. & min. values, standard deviation, skewness, kurtosis, probability, sum, the sum of sq. deviation, and observation numbers.

Table 1
Descriptive Measurements

	UNEM	LFEX	INF	EXCH	FDI	BM	GDP
Mean	5.51	64.47	8.65	49.79	0.82	43.15	2.22
Median	3.93	64.46	7.90	44.52	0.66	42.21	6.23
Maximum	16.70	76.31	26.14	135.85	3.66	79.07	2.10
Minimum	2.10	52.90	1.48	7.86	-0.02	14.05	4.02
Std. Dev.	3.94	6.00	4.19	30.18	0.75	14.37	4.17
Skewness	1.64	0.05	1.11	0.84	1.37	0.54	3.08
Kurtosis	4.70	2.16	5.19	3.10	5.41	3.30	12.16
Probability	0.00	0.12	0.00	0.00	0.00	0.02	0.00
Sum	794.77	9284.36	1246.22	7171.12	119.20	6214.52	3.20

Source: Author Own Calculations using Eviews

The subsequent Table displays descriptive measurements of the examined variables for the economies of (Bangladesh, India, Pakistan and Sri Lanka) from 1980-2015. The subsequent table exhibits the statistical characteristics of the examined data series. In starting rows mean, median, maximum, minimum, and standard deviation values are exhibited. Furthermore, kurtosis and skewness values were exhibited. All variables of this study are positively skewed. And all variables of this study are leptokurtic except for life expectancy (that is platy-kurtic). While in the last, probability and sum values are exhibited.

Panel Regression Analysis

In this panel data estimation researcher utilized four economic data (Bangladesh, India, Pakistan, and Sri Lanka) for determining the unemployment rate. Here, in panel data estimation researcher uses six independent variables (that are life expectancy, inflation, exchange rate, foreign direct investment, broad money and GDP) and one dependent variable (that is unemployment). The

following table shows how examined explanatory variables determine (or influence) unemployment in the case of Bangladesh, India, Pakistan, and Sri Lanka.

Table 2

Panel Regression Estimation

Model	Coefficient	Std. Error	t-statistic	Sig.
Constant	-34.9054	3.3761	-10.3386	0.0000*
LFEX	0.7468	0.0578	12.915	0.0000*
INF	0.1164	0.0502	2.3161	0.0220**
EXCH	-0.1067	0.0111	-9.5751	0.0000*
FDI	0.6679	0.3784	1.7649	0.0798***
BM	-0.0832	0.0247	-3.3698	0.0010*
GDP	-1.69E-12	7.24E-13	-2.3359	0.0209**
R-squared			0.68	
Adjusted R-squared			0.66	
AIC			4.52	
SIC			4.67	
F-significant			0.00	
Durbin-Watson			1.18	
Run test (Significance value)			0.126	

*, **, *** show significance at 1%, 5% and 10% respectively

Source: Author Own Calculations using SPSS

R-square estimates show that 68 % of variations in the dependent variable (unemployment) are explained by examined explanatory variables of this research. While Adjusted R-square results show that 66 % of variations in the dependent variable (unemployment) are explained by examined independent variables of this research. The AIC and SIC values are minimum for the examined model. Furthermore, the F-statistics value is "0.00", therefore we can reject the null hypothesis (H1: model is not best fitted) and can accept the alternative hypothesis (H1: model is best fitted). Based on the Durbin-Watson d-test value "1.18", it's found that d-Statistics is falling in the region of 'no decision'. Hence we applied a run test for checking the presence of autocorrelation in residuals s

In the above displayed table, the projected result shows that all variables of this study are statistically significant. The estimated regression coefficient value for LFEX is "**0.746**" which indicates that because of one unit increase in life expectancy, the unemployment rate increases by "**0.746**" while all remaining explanatory regression coefficients remain constant. The regression coefficient value for INF is "**0.116**" which indicates that because of a one percent increase in the inflation rate, the unemployment rate increases by "**0.116**" while all remaining explanatory regression coefficients remain constant.

Consequently, the estimated regression coefficient value for EXCH is "**0.106**'' which indicates that because of a one percent increase in the exchange rate, the unemployment rate decreases by "**0.106**'' while all other explanatory regression coefficients remain constant. The regression coefficient value for FDI is "**0.667**'' which indicates that because of a one percent increase in foreign direct investment inflow, the unemployment rate increases by "**0.667**'' while all remaining explanatory regression coefficients remain constant.

Moreover, the estimated regression coefficient value for BM is "**0.283**'' which indicates that because of a one percent increase in the broad money rate, the unemployment rate decreases by "**0.283**'' while all other explanatory regression coefficients remain constant. The regression coefficient value for GDP is "**1.69**'' which indicates that because of one unit increase in gross domestic product, the unemployment rate decreases by "**1.69**'' while all remaining explanatory regression coefficients remain constant.

Multiple Regression Analysis for Bangladesh

In this section, the researcher exhibited multiple regression analyses. In this multiple data, estimation researcher examined key determinants of the unemployment rate in the case of Bangladesh. Here, in multiple data estimation researchers uses six independent variables (that are life expectancy, inflation, exchange rate, foreign direct investment, broad money and GDP) and one dependent variable (that is unemployment). The following table shows how examined explanatory variables determine (or influence) unemployment in the case of Bangladesh's economy.

Table 3

Multiple Regression Estimation for Bangladesh

Model	Coefficient	Std. Error	t-statistic	Sig.
Constant	6.9557	4.5795	1.5188	0.1396
LFEX	-0.0703	0.0953	-0.7369	0.4671
INF	-0.0027	0.0421	-0.0648	0.0987***
EXCH	-0.0430	0.0497	-0.8647	0.3943
FDI	1.0654	0.5461	1.9509	0.0608***
BM	0.0895	0.0385	2.3203	0.0276**
GDP	-8.75E-12	6.53E-12	-1.3395	0.0908***
R-squared			0.52	
Adjusted R-squared			0.42	
AIC			1.84	
SIC			2.15	
F-significant			0.00	
Durbin-Watson			1.12	
Run test (Significance value)			0.141	

*, **, *** show significance at 1%, 5% and 10% respectively.

Source: Author Own Calculations using SPSS

R-square estimates show that 52 % of variations in the dependent variable (unemployment) are explained by examined explanatory variables of this research. While Adjusted R-square results show that 42 % of variations in the dependent variable (unemployment) are explained by examined independent variables of this research. The AIC and SIC values are minimum for the examined model. Furthermore, the F-statistics value is "0.00", therefore we can reject the null hypothesis (H1: model is not best fitted) and can accept the alternative hypothesis (H1: model is best fitted). Based on the Durbin-Watson d-test value "1.12", it's found that d-Statistics is falling in the region of 'no decision'. Hence we applied a run test for checking the presence of autocorrelation in residuals of the examined data series.

In the above displayed table, the projected result shows that all variables of this study are statistically significant. The estimated regression coefficient value for LFEX is "**0.076**'' which indicates that because of one unit increase in life expectancy, the unemployment rate decreases by "**0.076**'' while all remaining explanatory regression coefficients remain constant. The regression coefficient value for INF is "**0.006**'' which indicates that because of a one percent increase in the inflation rate, the unemployment rate decreases by "**0.002**'' while all remaining explanatory regression coefficients remain constant.

Consequently, the estimated regression coefficient value for EXCH is "**0.043**'' which indicates that because of a one percent increase in the exchange rate, the unemployment rate decreases by "**0.106**'' while all other explanatory regression coefficients remain constant. The regression coefficient value for FDI is "**1.065**'' which indicates that because of a one percent increase in foreign direct investment inflow, the unemployment rate increases by "**1.065**'' while all remaining explanatory regression coefficients remain constant.

Moreover, the estimated regression coefficient value for BM is "**0.089**'' which indicates that because of a one percent increase in the broad money rate, the unemployment rate increases by "**0.089**'' while all other explanatory regression coefficients remain constant. The regression coefficient value for GDP is "**8.75**'' which indicates that because of one unit increase in gross domestic product, the unemployment rate decreases by "**8.75**'' while all remaining explanatory regression coefficients remain constant. In short, the overall regression coefficients of this study confirm a statistically significant long run relationship with unemployment in the economy of Bangladesh. However, estimates of LFEX and EXCH are statistically insignificant for the case of Bangladesh.

Multiple Regression Analysis for India

In this section, the researcher exhibited multiple regression analyses. In this multiple data, estimation researcher examined key determinants of the unemployment rate in the case of India. Here, in multiple data estimation researchers uses six independent variables (that are life expectancy, inflation, exchange rate, foreign direct investment, broad money and GDP) and one dependent variable (that is unemployment). The following table shows how examined explanatory variables determine (or influence) unemployment in the case of the Indian economy.

Table 4
Multiple Regression Estimation for India

Model	Coefficient	Std. Error	t-statistic	Sig.
Constant	6.2763	2.6683	2.3521	0.0257**
LFEX	-0.0917	0.0544	-1.6857	0.1026
INF	-0.0035	0.0102	-0.3482	0.7302
EXCH	0.0343	0.0087	3.9230	0.0005*
FDI	-0.1754	0.0615	-2.8496	0.0080*
BM	0.0201	0.0100	1.9981	0.0552**
GDP	-2.68E-13	1.18E-13	-2.2786	0.0302**
R-squared	0.79			
Adjusted R-squared	0.75			
AIC	4.84			
SIC	2.53			
F-significant	0.00			
Durbin-Watson	1.56			
Run test (Significance value)	0.255			

*, **, *** show significance at 1%, 5% and 10% respectively.
Source: Author Own Calculations using SPSS

R-square estimates show that 79 % of variations in the dependent variable (unemployment) are explained by examined explanatory variables of this research. While Adjusted R-square results show that 75 % of variations in the dependent variable (unemployment) are explained by examined independent variables of this research. The AIC and SIC values are minimum for the examined model. Furthermore, the F-statistics value is "0.00", therefore we can reject the null hypothesis (H1: model is not best fitted) and can accept the alternative hypothesis (H1: model is best fitted). Based on the Durbin-Watson d-test value "1.56", it's found that d-Statistics is falling in the region of 'no decision'. Hence we applied a run test for checking the presence of autocorrelation in residuals of the examined data series. In the above displayed table, the projected result shows that all variables of this study are statistically significant. The estimated regression coefficient value for LFEX is "**0.091**'' which indicates that because of one unit increase in life expectancy, the unemployment rate decreases by "**0.091**'' while all remaining explanatory regression coefficients remain constant. The regression coefficient value for INF is "**0.003**'' which indicates that because of a one percent increase in the inflation rate, the unemployment rate decreases by "**0.003**'' while all remaining explanatory regression coefficients remain constant. Though, estimates of LFEX and INF are statistically insignificant for the case of India.

Consequently, the estimated regression coefficient value for EXCH is "**0.034**'' which indicates that because of a one percent increase in the exchange rate, the unemployment rate increases by "**0.034**'' while all other explanatory regression coefficients remain constant. The regression

coefficient value for FDI is "**0.175**'' which indicates that because of a one percent increase in foreign direct investment inflow, the unemployment rate decreases by "**0.175**'' while all remaining explanatory regression coefficients remain constant.

Moreover, the estimated regression coefficient value for BM is "**0.020**'' which indicates that because of a one percent increase in the broad money rate, the unemployment rate increases by "**0.020**'' while all other explanatory regression coefficients remain constant. The regression coefficient value for GDP is "**2.68**'' which indicates that because of one unit increase in gross domestic product, the unemployment rate decreases by "**2.68**'' while all remaining explanatory regression coefficients remain constant. In short, overall estimates of this study confirms a statistically significant long run relationship with unemployment for the economy of India. However, estimates of LFEX and INF are statistically insignificant for the case of India.

Multiple Regression Analysis for Pakistan

In this section, the researcher exhibited multiple regression analyses. In this multiple data, estimation researcher examined key determinants of the unemployment rate in the case of Pakistan. Here, in multiple data estimation researchers uses six independent variables (that are life expectancy, inflation, exchange rate, foreign direct investment, broad money and GDP) and one dependent variable (that is unemployment). The following table shows how examined explanatory variables determine (or influence) unemployment in the case of Pakistan's economy.

Table 5

Multiple Regression Estimation for Pakistan

Model	Coefficient	Std. Error	t-statistic	Sig.
Constant	-4.5265	15.959	-0.2836	0.7787
LFEX	0.1692	0.2762	0.6127	0.0448**
INF	-0.0264	0.0432	-0.6103	0.0464**
EXCH	0.1004	0.0356	2.8169	0.0086*
FDI	0.2855	0.3355	0.8509	0.4018
BM	-0.0438	0.0645	-0.6804	0.0516**
GDP	-3.49E-11	8.02E-12	-4.3438	0.0002*
R-squared	0.74			
Adjusted R-squared	0.69			
AIC	2.69			
SIC	3.00			
F-significant	0.00			
Durbin-Watson	1.01			
Run test (Significance value)	0.165			

   *, **, *** show significance at 1%, 5% and 10% respectively.

Source: Author Own Calculations using SPSS

R-square estimates show that 74 % of variations in the dependent variable (unemployment) are explained by examined explanatory variables of this research. While Adjusted R-square results show that 69 % of variations in the dependent variable (unemployment) are explained by examined independent variables of this research. The AIC and SIC values are minimum for the examined model. Furthermore, the F-statistics value is "0.00", therefore we can reject the null hypothesis (H1: model is not best fitted) and can accept the alternative hypothesis (H1: model is best fitted). Based on the Durbin-Watson d-test value "1.01", it's found that d-Statistics is falling in the region of 'no decision'. Hence we applied a run test for checking the presence of autocorrelation in residuals of the examined data series.

In the above displayed table, the projected result shows that all variables of this study are statistically significant. The estimated regression coefficient value for LFEX is "**0.169''** which indicates that because of one unit increase in life expectancy, the unemployment rate increases by "**0.169''** while all remaining explanatory regression coefficients remain constant. The regression coefficient value for INF is "**0.026''** which indicates that because of a one percent increase in the inflation rate, the unemployment rate decreases by "**0.026''** while all remaining explanatory regression coefficients remain constant.

Consequently, the estimated regression coefficient value for EXCH is "**0.100''** which indicates that because of a one percent increase in the exchange rate, the unemployment rate increases by "**0.100''** while all other explanatory regression coefficients remain constant. The regression coefficient value for FDI is "**0.285''** which indicates that because of a one percent increase in foreign direct investment inflow, the unemployment rate increases by "**0.285''** while all remaining explanatory regression coefficients remain constant.

Moreover, the estimated regression coefficient value for BM is "**0.043''** which indicates that because of a one percent increase in the broad money rate, the unemployment rate decreases by "**0.043''** while all other explanatory regression coefficients remain constant. The regression coefficient value for GDP is "**3.49''** which indicates that because of one unit increase in gross domestic product, the unemployment rate decreases by "**3.49''** while all remaining explanatory regression coefficients remain constant. In sum, overall estimates of this study confirm a statistically significant long run relationship with unemployment for the economy of Pakistan. However, estimates of FDI are statistically insignificant in the case of Pakistan (Ali et al., 2019).

Multiple Regression Analysis for Sri Lanka
In this section, the researcher exhibited multiple regression analyses. In this multiple data, estimation researcher examined key determinants of the unemployment rate in the case of Sri Lanka. Here, in multiple data estimation researchers uses six independent variables (that are life expectancy, inflation, exchange rate, foreign direct investment, broad money and GDP) and one dependent variable (that is unemployment). The following table shows how examined explanatory variables determine (or influence) unemployment in the case of the Sri Lankan economy.

Table 6

Multiple Regression Estimation for Sri Lanka

Model	Coefficient	Std. Error	t-statistic	Sig.
Constant	-21.1628	17.0592	-1.2405	0.2247
LFEX	0.5893	0.2470	2.3851	0.0238**
INF	-0.0090	0.0318	-0.2852	0.7775
EXCH	-0.1577	0.0211	-7.4541	0.0000*
FDI	-0.5243	0.3361	-1.5599	0.0126*
BM	0.0408	0.0538	0.7574	0.4543
GDP	-8.59E-12	1.39E-11	-0.6165	0.0423*
R-squared			0.58	
Adjusted R-squared			0.55	
AIC			2.78	
SIC			3.09	
F-significant			0.00	
Durbin-Watson			1.11	
Run test (Significance value)			0.146	

*, **, *** show significance at 10%, 5% and 1% respectively.

   Source: Author Own Calculations using SPSS

R-square estimates show that 58 % of variations in the dependent variable (unemployment) are explained by examined explanatory variables of this research. While Adjusted R-square results show that 55 % of variations in the dependent variable (unemployment) are explained by examined independent variables of this research. The AIC and SIC values are minimum for the examined model. Furthermore, the F-statistics value is "0.00", therefore we can reject the null hypothesis (H1: model is not best fitted) and can accept the alternative hypothesis (H1: model is best fitted). Based on the Durbin-Watson d-test value "1.11", it's found that d-Statistics is falling in the region of 'no decision'. Hence we applied a run test for checking the presence of autocorrelation in residuals of the examined data series.

In the above displayed table, the projected result shows that all variables of this study are statistically significant. The estimated regression coefficient value for LFEX is "**0.589**" which indicates that because of one unit increase in life expectancy, the unemployment rate increases by "**0.589**" while all remaining explanatory regression coefficients remain constant. The regression coefficient value for INF is "**0.009**" which indicates that because of a one percent increase in the inflation rate, the unemployment rate decreases by "**0.009**" while all remaining explanatory regression coefficients remain constant.

Consequently, the estimated regression coefficient value for EXCH is "**0.157**" which indicates that because of a one percent increase in the exchange rate, the unemployment rate decreases by "**0.157**" while all other explanatory regression coefficients remain constant. The regression coefficient value for FDI is "**0.524**" which indicates that because of a one percent increase in

foreign direct investment inflow, the unemployment rate increases by "**0.524**'' while all remaining explanatory regression coefficients remain constant.

Moreover, the estimated regression coefficient value for BM is "**0.040''** which indicates that because of a one percent increase in the broad money rate, the unemployment rate increases by "**0.040''** while all other explanatory regression coefficients remain constant. The regression coefficient value for GDP is "**8.49''** which indicates that because of one unit increase in gross domestic product, the unemployment rate decreases by "**8.49''** while all remaining explanatory regression coefficients remain constant. In short, the overall regression coefficients of this study confirm a statistically significant long run relationship with unemployment in the economy of Sri Lanka. However, estimates of INF and BM are statistically insignificant for the case of Sri Lanka.

Conclusion and Recommendations

The primal objective of this research is to find out the imperative determinants of the Unemployment Rate for the economies of Bangladesh, India, Pakistan and Sri Lanka separately. In this research LFEX, INF, EXCH, FDI, BM, and GDP are considered as possible determinants of unemployment over the time period 1980-2020. Furthermore, Panel Regression analysis was also performed for exploring unemployment determinants and their joint impact on selected economies (Bangladesh, India, Pakistan and Sri Lanka) in chapter 4. Unemployment is a trending concern in all countries particularly, developing economies. Economic activities in any economy are largely determined by prevailing employment and unemployment levels. A high unemployment rate hinders the smooth flow of economic activities. Several measures have been considered by researchers to overcome the unemployment problem.

In this study, the researcher discovered that LFEX, INF, EXCH, FDI, BM, and GDP are the statistically significant determinants of the unemployment rate in selected economies. The developed panel regression model is the best fitted model confirmed by the R-square and the adjusted R-square values. Furthermore, all required regression assumptions (such as autocorrelation and Heteroscedasticity) were also checked for this model. Multiple regression analysis also considers LFEX, INF, EXCH, FDI, BM, and GDP as the key determinants of unemployment in the case of Bangladesh, India, Pakistan and Sri Lanka separately. The developed multiple regression models are the best fitted models confirmed by the R-square and the adjusted R-square values. Furthermore, all required regression assumptions (such as autocorrelation and Heteroscedasticity) were also checked for these models.

The present research will assist policymakers and researchers to control the rate of unemployment, devising national and international policies, and the forecasting monetary policy of examined countries.

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