Modelling the Impact of FDI on Decreasing unemployment; Evidence from Pakistan

Fazal Qadeem*, Kuanqi Du*, Syed Muhammad Suleman*, Rafid Ullah Khan*, Usman Ullah Khan**

* School of Economics and Management, Nanjing University of Science and Technology, Nanjing, China
** Department of Economics, Hazara University Mansehra, KPK, Pakistan
Corresponding author email: fqadeem2025@yahoo.com

Abstract: This work investigates the impact of foreign direct investment and other factors on unemployment reduction in Pakistan for the period of 1990-2017. The study utilized Auto Regressive Distributive Lag (ARDL) model and Error Correction Mechanism (ECM) to test long run and short run relationship among FDI, inflation, Bureaucracy, labour density and unemployment. The results reveal that FDI and Bureaucracy have negative and statistically negative influence on unemployment both in the short and long run. In the long run, Inflation has positive significant effect on unemployment reduction but, in short runs have no-significant impact on unemployment reduction. However, Labour density has constructive significant influence on the reduction of unemployment in both short run as well as long run. Policy recommendations are given based on the results obtained in this study.

Keywords: FDI, unemployment, Bureaucracy, labor density, inflation

1.Introduction
1.1. Background of the Study

Foreign direct investment is one of the significant factors of an open and proficient international economic system, as against to the strict well planned economies. FDI is an investment directly made by a company or by an individual in other country in a manufacturing or business concern, either directly by developing a business or increasing the process of current firm or buying a company based on the target country. Foreign direct investment includes mergers and possession, construction of new conveniences, and reinvestment of foreign operating profits (Adeleke *et al*, 2014). Foreign direct investment can be done in various ways including the opening of subsidiaries, obtaining an active foreign trade or by means of merger or joint venture with a foreign firm.

Foreign direct investment maximizing the benefit for the host country by having more transfer the skill of technology, support formation of capital, assistance to a competitive business environment, expanding the integration of international trade, developing the creation of new jobs and promotes the whole economic growth in the host country. These profits sequentially can, encourage our major economic sectors, for example oil, mining, manufacturing, agriculture, transportation, communications and construction, crucial for obtaining high employment rate and economic growth and development. However, the returns that foreign direct investment carry to countries may vary, depends on the economic situation and the resources accessibility.

In contrast, the continued unemployment of the work force remains the most important issue for developing countries. Interpreting unemployment due to general equilibrium depend on the type of workforce being considered. Harts and Todaro (after 1970) introduce a model to ascertain unemployment in a common equilibrium framework. Though, in such type of model, unemployment is particular for the urban sector and applies only to unemployment that explains in-experienced labour. However, this cannot solve the problem of unemployment of skilled workers, which is a worrying issue for less developed countries, especially after the globally economic crises. In 2012, more than 197 million people worldwide did not work, accounting for 6% of the global workforce (ILO). According to the current condition, over the 3 million people in Pakistan are unemployed and their existing over 12% unemployment rate.

Pakistan committed is to decrease the unemployment by encouraging growth in the production sector, creation of jobs, promoting income resources and through economic liberalization improving the country's economic competitiveness, deregulating and transparent privatization (GOP, 2010).

Past researches have conducted to establish the connection between FDI and economic growth, FDI and exchange rate. But in case of Pakistan few empirical studies have been exists on the effect of FDI on unemployment. For example, Zeeb et al, (2014) carried out research on the effect of FDI on unemployment reduction in Pakistan, but their study reveals limitation in terms of analysis of short run and long run relationship between them. To fill this gap, the present study investigating the short run and long run effect of FDI on unemployment reduction in Pakistan, by particularly including an important variable bureaucracy which is an important factor determines the economic policies which are crucial for economic growth and can protect property rights and impose contracts, thus stimulating private investments and business activities.

The remaining paper is organized as follows: section-2 discusses the literature review; section-3 discusses the data and methodology, in section-4 the main results are presented, while the conclusion as well as policy recommendations are showed in section-2.

2. Literature Review

Foreign direct investment is important for development. Projects financed by foreign investors producing more jobs market for both skilled and unskilled labours. This is assumed to decrease the rate of unemployment (Balcirzak and Zureck, 2011; Pinn et al, 2011; Subramoniam and Baharomshah, 2011; Yabuuchi, 1999; Habib and Sarwar, 2013).

Several studies have been made attempts to investigate empirically the influence of foreign direct investment on unemployment.

2.1. The impact of FDI on unemployment

Johnny *et al*, (2018) analysed the impact of "foreign direct investment" on unemployment rate in Nigeria for the time period of 1980-2015. The study employed co-integration test and OLS techniques. The results indicate that foreign direct investment has insignificant negative impact on Nigerian unemployment. Based on the results their study recommended that government requires sound policies to catch the attention of overseas investors to Nigeria in turn to formulate more investment and must also make sure of all resources fully employed for production activities before going to saving.

Zeb et al, (2014) studied the relationship between FDI and unemployment in Pakistan in the period of (1995 to 2011). Multiple regression analysis was employed for estimation of the impact of FDI on unemployment in Pakistan. Results show that FDI plays a vital role in unemployment reduction in Pakistan. Their study suggests that government should

measure fiscal and monetary policies for attracting businesses and especially foreign direct investment.

Shari et al, (2012) explored the impact of FDI on unemployment and economic growth in Malaysia during the period of 1980-2010. For empirical estimation Ordinary Least Square method was employed. They concluded that FDI reduced unemployment and increases economic growth in Malaysia.

Mucuk *et al*, (2013) investigated foreign direct investment as well as unemployment for seven different developing countries including: Turkey, Philippine, Chile, Argentina, Thailand and Uruguay during the time period of 1981 to 2009. Panel unit root, Panel Co-integration and Panel causality tests were used for empirical analysis. Results revealed that foreign direct investment and unemployment moved in the same direction in long run. FDI enhances unemployment in Argentina and Turkey but decreases it in Thailand. They recommended that the negative influence of FDI on unemployment are caused by Brownfield investment which are composed of attainment and mergers, therefore policy makers must be taking into account only on Greenfield investment to generate more jobs opportunities.

Irpean *et al*, (2016) investigated the connection between FDI and unemployment in Malaysia for the time interval of 1980-2012. Autoregressive distributed lag (ARDL) model was used for long run association between the variables. Their study found that FDI, foreign workers and GDP negatively significant impact on rate of unemployment in Malaysia.

2.2. The impact of Inflation on unemployment

Inflation is the general increase of prices of various commodities rather than a single commodity (Hall, 2009). A.W Philips (1958) reported first the trade-off between inflation and unemployment. The trade-off between the two variables is that as the unemployment rate diminishes, labourers are empowered to demand higher salaries and wages. In return, the added cost transferred by businesses to the consumer by increasing the goods prices. Consequently, this raises the inflation in the economy. In Philips curve, policy makers can solve only one problem either reduce unemployment and increase inflation or increase unemployment and decrease the inflation but not both.

Macharia and Otieno, (2015) analysed the effect of inflation on the unemployment in Kenya. They examined that inflation has negative significant effect on unemployment in Kenya both in short run and long run. As a result, the study found the notion of Philips Curve does not hold in Kenya. The study recommended the policy that government should arise with the policies to maintain minimum possible rate of

inflation in the country to get possible low level of unemployment.

2.3. The impact of Bureaucracy on unemployment

Adler and Borys, (1996); Saparito and Coombs, (2013) pointed out that bureaucracy can contribute to create ideas and behaviours of extra role. A bureaucracy enhances the development of new ideas in organization through facilitating the innovation and transfers the technology, and by these channels decreases the unemployment in the economy[1].

Hess, (2006) found that bureaucracy serve standards transferring for the best manner of performance of tasks, providing alliance between different jobs and facilitating the redesign of work process, and as a result improve the employee's capabilities and enhance the employment.

Baccaro and Rei, (2007) viewed the institutional determinants of unemployment in OECD countries. They found labour market rigidities have caused the unemployment. They also found that union density has positively association with unemployment, while bargaining coordination reduces the unemployment.

Feeney and De Hart-Davis (2014) studied bureaucracy and public employee behaviour by evaluated mail survey data of four cities employees in Midwestern state. They argued that based on government recreation point of view, less work of bureaucratic environment should burst creativeness, risk-taking and public employees' productivity, and as a result increase the unemployment rate.

Bernal-verdugo *et al*, (2012) found that bureaucratic policies intend to raise flexibility in labor market and would reduce unemployment. Agenor et al, (2007) studied Middle East and North Africa and

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[1] Bureaucracy is the body of officials nonelected which involved in public administration. Bureaucracy is the structure and set of regulations in place to control activity, generally in large organizations and government.

argued that bureaucratic policies about labour policies has decrease the unemployment, and also improving indirectly the effectiveness of governance. Similarly, Anand and Khera (2016) studied the effect of bureaucratic policies about labour market reforms in India and found that bureaucracy has negative and significant impact on unemployment. Aghaz and Tarighian, (2016) examined the impact of bureaucratic structure on employment in Iran. The results indicate that bureaucracy has significant and positive impact on employment in Iran.

Bouzid (2016) evaluated the relationship between corruption and unemployment. He believes that corruption by public official is achieved through hiring power tend which in turn lead to increase the unemployment rate between youth and educated labours, and as a result in more corruption when job-seekers have to induce the officials for job.

Lacko (2004) investigated the relationship between corruption and unemployment in a roundabout way. He found that higher level of corruption combined with higher labour tax contributed to increases the unemployment.

According to World Bank (2012) reports corruption influence unemployment indirectly, through channel of reduced quality of public investment resulting in lower growth and income, which consequently hampers job creation in the long run. Nevertheless, the policies implement of efficient labour can facilitate human capital development, improves the social unity and as a result decrease the incentives for corruption.

2.4. The impact of labour density on unemployment

Lacovoiu (2012) analysed the effect of investment on unemployment in Romania during 2004 to 2012. The result indicates that a decrease in net investment brings to a reduced more of the labour workers employed, and as a result to rise in unemployment rate.

Variables	Measurement	Sources of Data
Dependent Variable:		
Unemployment		**WDI, 2019**
Independent Variables:		
FDI	**Net inflows (% of GDP)**	**WDI, 2019**
Inflation	**Consumer prices (annual %)**	**WDI, 2019**
Bureaucracy	**Bureaucracy Quality**	**International Country Risk Guide**
Labor Density	**Workers / sq km land**	**WDI, 2019**

Mehmood *et al*, (2014) studied the relationship between unemployment and different factors which affects the unemployment in Pakistan. Utilize stepwise regression technique for time period of 1990 to 2010. Their results showed that labour force has positive

effect on unemployment whilst inflation and FDI have negative effect on the unemployment.

Acero (1993) empirically analysed various factors of unemployment. She argued that by neoclassical perspective various elements cannot be pointed out. The factors associated to job search. She

said that as jobs of workers change the job market keeps on changed by itself. When these modifications occur for an extended period of time as a result of heterogeneity in work force and job opportunities, non-availability of perfect knowledge or training cost, we face a problem. For long period when we left the people unemployed, it also makes issues. Other factors, for example rigidity in wage, the impact of labour union and labour legislation.

Asad et al, (2000) studied the factors of unemployment in Egypt. Egypt labour market was suffering by long and high level of unemployment, where unemployment is improving at a constant rate. Results indicates that private sector effecting female labour force that that of male counterpart. To enter the job market female faces some problems, particularly in private sector. In the last they suggested good policy environment that is need of good techniques for labour intensive and exports oriented industries, it would be helpful to absorb the new applicants into the labour market.

Rebetzer, (1988) concluded that unemployment caused by the tighten of labour market that, labour unit costs will rise and labour productivity growth to slow.

3. Methodology and Data Sources
3.1 Data Sources
The aim of this work is to investigate the impact of FDI and other determinants on unemployment reduction in Pakistan. Unemployment is a dependent variable, while FDI, inflation, Bureaucracy and labour density are our explanatory variables. The data used in this study are taken from World Development Indicators and International Country Risk Guide. The time period covered in this study is 1990-2017.
3.1.1. Model
This the model that was on the base of previous studies of (Zeb et al, 2014; Irpan et al, 2016; Johnne et al, 2018). For example, Irpan et al, (2016) explored the connection between FDI and unemployment in Malaysia, employed Autoregressive distributed lag (ARDL) model was utilized for long run relationship between the variables. Hence, the present study using (ARDL) model for long run and short run relationship between FDI and unemployment reduction in Pakistan. The model is following as:

Unem = β_0 + β_1FDI+ β_2Infl+ β_3Bureaucracy+ β_4Labordensity + u……………………………… (1)

Where, the signs of FDI and Bureaucracy are expecting to negative, while the signs of Inflation and labour density are expecting to positive. Information was obtained from the web site:
3.2 Unit Root Test
Most of the economic studies which deals with time series using OLS technique without checking of stationarity of variables used in the model. This may create ambiguous and false results, so a lot of statistical problems may accordingly have emerged due to the using of such traditional models. One of the most general tests used for time series stationarity is the Augmented Dickey-Fuller test that analyses the presence of unit root problem hypothesis (and then non-stationarity of time series) as a null hypothesis **3.3 ARDL Model**

This paper is specially designed to investigate FDI and other determinants on unemployment reduction in Pakistan. For this purpose, Autoregressive Distributed Lag (ARDL) model is employed, as developed by Pesaran et al, (2001). This model is employed for two reasons. First ARDL model is useful for time series investigation without the order of integration of the variables, either I (I) or I (0). Second, ARDL technique integrates the analysis of both short run and long run. Thus by the following Pesaran et al, (2001) frame work, we denote the model as follows:

unempt= β_0 + $\beta_1$unempt-1 + β_2FDIt-1 + β_3 Inft-1 + β_4 Burecrcyt-1 + β_5LabDensityt-1 + $\sum_{i=1}^{n} \beta i$ Δuempt-1+ $\sum_{i=0}^{m1} \psi i$ Δ FDIt-1 + $\sum_{i=0}^{m2} \bar{Y}i$ Δ Inft-1 + $\sum_{i=0}^{m3} \delta i$ Δ Burecrcyt-1+ $\sum_{i=0}^{m4} \theta i$ ΔLabDensityt-1+ ut…………..…………….……………….……….… **(2)**

where denotes the first difference operator, β_0 indicates drift component, ut represents the error term, from$\beta_1$toβ_5 are long run multiplier of each of the variable, βi, ψi, $\bar{Y}i$, δi, and θi with sign summation are the short run dynamics variables. Equation (2) contains two parts. The first part denotes the equation for long run whilst the second equation with lag captured dynamic short run equation.

According to null hypothesis which use ARDL co-integration test; there is no long run association between our variables of interest. This is following as:
Long run Null hypothesis
$\Upsilon1 = \Upsilon2 = \Upsilon3 = \Upsilon4 = \Upsilon5 = 0$……………………. **(3)**
Long run alternative hypothesis
$\Upsilon1 \neq \Upsilon2 \neq \Upsilon3 \neq \Upsilon4 \neq \Upsilon5 \neq 0$……………………. **(4)**

In the past, especially in the early days of applying ARDL in empirical researches, the calculated F-test value attained from the investigation of the above equation would be compared with lower as well as with upper critical values as displayed in the table of Pesaran et al, (2001). If the F-test value attained is larger than the upper critical value, this show that there exists co-integration as well as long run relationship and the null hypothesis of no-co-integration is not accepted. Conversely, if the F-test value is less than the lower critical value, then there will be no long run relationship. The conclusion is uncertain, if the F-test value is in-between the lower critical values.

Based on the evidence of presence of co-integration among the variables, the study would proceed to the analysis of the Error Correction Model (ECM). The ECM indicate the speed of adjustment to

the long run equilibrium after short run disequilibrium in the economy. The ECM model as the following:

unempt= βo + $\sum_{i=1}^{n} \beta i$ Δuempt-1+ $\sum_{i=0}^{m1} \psi i$ Δ FDIt-1 + $\sum_{i=0}^{m2} \bar{Y}i$ Δ Inft-1 + $\sum_{i=0}^{m3} \delta i$ Δ Burecrcyt-1+ $\sum_{i=0}^{m4} \theta i$ΔLabDensityt-1+ ηCointEq (-1)+ ut…………. **(5)**

4. Empirical Results

Table 2, indicates the descriptive statistics of variables in the study. The average value of unemployment is 3.989, while the standard deviation which shows the dispersion from the average is 2.528.

The mean value of FDI is 1.146, while the standard deviation is 0.85. The average value of inflations is 8.48, while the standard deviation is 4. 189. The mean value of bureaucracy is 2.047, whereas its standard deviation is 0.335. Lastly, the mean value of labour density is 4.08, whereas the standard deviation is 2.8. The skewness values are within the range of a normal distribution[2].

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[2] For normal distributed variable, the skewness coefficients are respectively lying between 0 and 3 (Gujrati, 5th Edition)

Table 2: Present descriptive statistics of the variables in our study

	UNEMP	FDI	INFL	BUREACY	LABORD
Mean	3.989442	1.146237	8.485016	2.047143	4.80E-05
Median	4.270000	0.829203	8.486608	2.000000	4.81E-05
Maximum	7.830000	3.668323	20.28612	3.000000	5.17E-05
Minimum	0.397700	0.382827	2.529328	1.000000	4.35E-05
Std. Dev.	2.528441	0.851459	4.189935	0.335778	2.81E-06
Skewness	-0.108410	1.866875	0.581267	0.467470	-0.220442
Kurtosis	1.665101	5.491280	3.371981	8.006258	1.664086
Jarque-Bera	2.133793	23.50525	1.738167	30.25952	2.308886
Probability	0.344075	0.000008	0.419336	0.000000	0.315233
Sum	111.7044	32.09464	237.5805	57.32000	0.001344
Sum Sq. Dev.	172.6113	19.57452	474.0001	3.044171	2.13E-10
Observations	**28**	**28**	**28**	**28**	**28**

Source: Author own calculation

4.2 Correlation matrix results

Table 3, shows the results obtained from the correlation matrix analysis of the variables. From the table, it is shown that the variables bureaucracy and FDI are negatively associated with unemployment, while Inflation and Labour density are positively correlated with unemployment. Among the independent variables, more moderate correlations can also be viewed, which suggest that among the variables multi co-linearity problem not exist in our study.

Table 3: Correlation matrix of the variables

	UNEMP	FDI	INFL	BUREACY	LABORD
UNEMP	1.000000				
FDI	-0.389686	1.000000			
INFL	0.483101	0.342247	1.000000		
BUREACY	-0.281227	0.164451	0.098522	1.000000	
LABORD	0.123048	0.095914	-0.395707	0.065010	1.000000

Table 4: Results of unit root test

Variable level First differences				
Constant Constant and trend Constant Constant and trend				
Unemployment	-1.851641 (0)	-2.396222 (0)	-5.944199 (1)*	-5.747349 (1)*
FDI	-2.801586 (0)***	-2.729088 (0)	-3.346139 (1)**	-3.291543 (1) ***
Inflation	-2.148332 (0)	-2.190514 (0)	-6.509393 (1)*	-6.373984(1)*
Bureaucracy	-6.448687 (0)*	-6.409513 (0)*	-7.466010 (1)*	-7.342005 (1)*
Labour Density	-1.710952 (0)	-2.650851 (0)	-5.106844 (1)*	-4.672277 (1)*

Source: Author own calculation
*,**,*** show 1%, 5% and 10%

4.3 Unit Root Result

The result of unit root test on the basis of Augmented Dickey-fuller (ADF) with constant and, constant and trend are presented in **table 4**. The results indicate that series of unemployment, inflation and labour density are not stationary at level; i.e integrated at one I (1), while FDI and bureaucracy are stationary at level; i.e integrated at I (0). So, ARDL model might be an appropriate technique for the co-integration in the present study. The key advantage of this technique lies on the fact that it precludes the needs to classify variables into I (l) or (0).

In addition, evaluated the standard co-integration test, there is no need for unit root pre-testing.

4.4. Results of Diagnostic Tests

Table 5: Present the information of Diagnostic tests. The result of Jarque-Bera test for normality indicates that p-value (0.2874) is greater than 5% level of significance level. This means that our data is normally distributed. The p-value of Breusch-Godfrey LM Testis (0.6028) that is greater than 5% level of significance, so there is no auto-correlation problem. Breusch-Pagan-Godfrey test is tested for Heteroscedasticity; the p-value is higher than 5% i.e. 0.9010 which shows that there is no Heteroscedasticity problem in our data. In the last, Ramsey RESET Test is conducted for detect of specification error. The p-value is greater than 5% i.e. (0.5886), reveals that our model is correctively specified.

Table 5: Results of Diagnostic Tests

Item	Test applied	Chi-Square	Probability
Serial Correlation	Breusch-Godfrey LM Test	0.659001	0.6028
Normality	Jaque-Bera Test	2.493568	0.2874
Functional form	Ramsey RESET Test	0.548850	0.5886
Heteroskedasticity Test	Breusch-Pagan-Godfrey	0.169247	0.9010

Source: Author own calculation

4.5 ARDL Bound test results

In **Table 6** the bound test results are displayed. According to the table 5, the estimated value of F-statistic (5.117963) is greater than of upper bound test critical value at level of significant around 5% (3.67).

This indicates that null hypothesis of no co-integration is rejected at 5% significance level. Therefore, we conclude that there exist long run relationship among the variables, and we can investigate the long run impact of each variable on changes of unemployment.

Table 6: Bound test Results

Test Statistic	Value	K n
F-statistic	5.117963	3
Significance	Lower Bound value	Upper Bound Value
10%	2.37	3.2
5%	2.79	3.67
1%	3.65	4.66

Source: Author own calculation

4.6 ARDL long run Results of the impact of FDI on unemployment reduction in Pakistan

Table 7 shows the results of ARDL long run which represent the relation between unemployment and its determinants. The ARDL results indicate that foreign direct investment, inflation, bureaucracy and labour density have negative effect on the unemployment of Pakistan in the long run. The coefficient of FDI has negative and statistically substantial effect on unemployment in Pakistan. So, we reject our null hypothesis and accept the alternative. This implies that if FDI inflow raises then unemployment will decrease. One unit increasing in FDI brings to 5.86 units' reduction in unemployment.

This result is same with those of (Zeb et al, 2014; Irpan et al, 2016).

Inflation has also a negative influence on the unemployment. Result indicates that one percent increase in inflation result into 1.14 % reduction in the unemployment rate and this is important at 5 %. This implies that the increase of prices the purchasing power start to decreasing, eventually decreasing the demand.

That brings to reduce the in production activities, and a reducing trend in the factors of production utilization. That consecutively leads to increasing rate of unemployment. This result is consistence with that of (Maqbool et al, 2013; Mirza et al, 2015).

The coefficient of Bureaucracy is significant and negative relationship with unemployment reduction. The result reveals that 1% increases in Bureaucracy leads to 10.77% fall in unemployment. This implies that bureaucracy ensures the competency of the bureaucrats and their motivation to focus on long-term goals, which are important. Bureaucracy made good governance, especially low level of corruption. This result is similar to the findings of (Baccaro and Rei,

2007; Aghaz and Tarighian, 2016; Anand and Khera, 2016).

In the last, Labour Density has negative relationship with unemployment which is noteworthy at the 5 %. This implies that in Pakistan high population growth increases more labours. Thus being a limited market, a saturated state is developed which increases the unemployment. This result is same to the results of (Mahmood et al, (2014).

Table 7: ARDL Model Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	30.909317	7.477827	4.133463	0.0033
FDI	-5.869874	2.819354	-2.081993	0.0709
INFL	-1.144404	0.339160	-3.374227	0.0279
BUREACY	-10.776597	3.823550	-2.818479	0.0225
Labor Density	338734.582095	114134.421393	-2.967856	0.0412

Source: Author own calculation

Results of Error Correction Model (ECM)

Results of ECM model are given in **table 8**. The coefficient of ECT (-1) term is 0.32 which is negative and significant at 1 %. This indicates that speed of adjustment from short run fluctuations to long run equilibrium (32 % discrepancy is corrected each year) 32 % of disequilibrium from the past year's shock convergence back to the long run equilibrium in the present year. It confirms the long run relationship

between the variables. The short run results show that all the variables have significant impact on unemployment reduction in Pakistan. In contrast, inflation has an insignificant impact on unemployment reduction. The R-squared value is 0.6233 that indicates that 62% variations explained in dependent variable is due to the explanatory variables. The F-statistic value is highly significant, which reveals that our model is appropriate as a whole.

Table 8: Results of Error Correction Model or Short Run Coefficients

| Variable	Coefficient	Std. Error	t-Statistic	Prob.
D (FDI)	-1.790854	0.384310	-4.659924	0.0016
D (INFL)	0.116299	0.068947	1.686783	0.1301
D (BUREACY)	-1.498766	0.504396	-2.971406	0.0178
D (LABORD)	533338.139115	119698.018373	4.455697	0.0112
CointEq (-1)	-0.328570	0.053033	-6.195541	0.0003
R-squared	0.773348	Adjusted R-squared		0.623375
AIC	2.465063			
F-statistic	19.47759			
Prob (F-statistic)	0.000116			
Durbin-Wantstat	2.442488			

Source: Author own estimation

Results of Stability Tests

Stability tests are used to examine that how the fit of ARDL model is good. Brown et al, (1975) recommended two tests i.e. Cumulative Sum and Cumulative Sum of Square, for checking of structural stability. CUSUM test captured the regular alterations in regression coefficients, while CUSUMQ control the exit of parameters from instability. Both CUSUM and CUSUMQ are within critical bounds of 5 %, so it shows that the model is structurally stable. Figure1: Cumulative Sum of Recursive Residuals

5. Conclusion and Policy Recommendation

The aim of this study is to analyse the impact of foreign direct investment and other factors on unemployment reduction in Pakistan from 1990 to 2017. The study utilized Auto Regressive Distributive Lag (ARDL) model and Error Correction Mechanism (ECM) to test long and short run relationship among FDI, inflation, Bureaucracy, labour density and unemployment. The results indicate that FDI and Bureaucracy have a negative and statistically significant influence on unemployment reduction both in the short and long run. In the long run, Inflation has

positive significant effect on unemployment reduction but, in short run has insignificant impact on unemployment reduction. Labour density has a positive significant impact on unemployment reduction in both short run and long run. The diagnostic tests result illustrate that our data is normally distributed, no specification error, and also free from multi collinearity and heteroscedasticity problems.

Figure1: Cumulative Sum of Recursive Residuals

Figure2: CUSUMQ Test
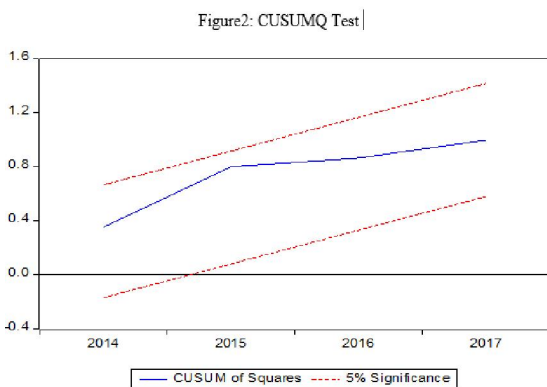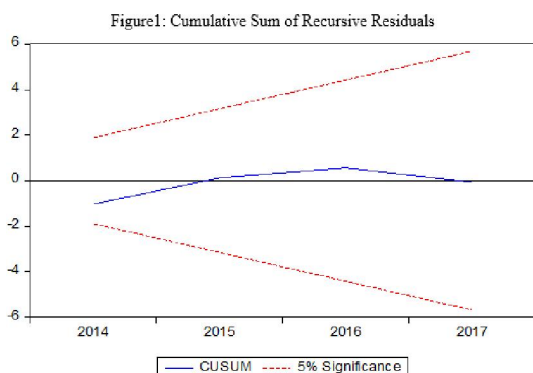
According to the results and in line with unemployment reduction in Pakistan, this study recommends the following policies: In Pakistan, unemployment rate is very high and it rising day by day. For this, government needs to create employment opportunities for both educated and uneducated people. Strategies to labour intensive are acquired for the poor people in rural and urban areas hence they can take participation in the growth of the economy. Provide vocational and technical education training to the public can develop the skills and earned reasonable income of unemployed people.

Government need to make sound economic policies, enhance infrastructure facilities, better law and order situation, overcome energy crises and provide a peaceful environment to overcome harsh problem of unemployment and increase economic growth of Pakistan.

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