## Saudi Journal of Business and Management Studies

Scholars Middle East Publishers Dubai, United Arab Emirates

Website: http://scholarsmepub.com/

ISSN 2415-6663 (Print) ISSN 2415-6671 (Online)

# Econometric Analysis of Foreign Direct Investment and Terrorism in Pakistan Irfan Ullah

PhD. Candidate, School of Business Administration, Zhongnan University of Economics, Wuhan, China

#### \*Corresponding Author:

Irfan Ullah

Email: irfanecon@gmail.com

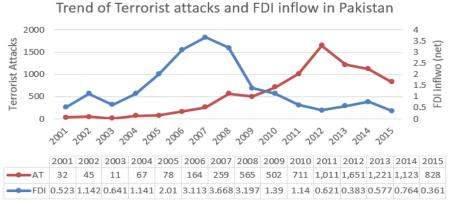
**Abstract:** This study will analyze the impact of terrorism on foreign direct investment in Pakistan. Since Pakistan become non-Natto alley and play a vital role in "War of terror", this also affected foreign direct investment (FDI) inflow in Pakistan. Therefore this studies empirically analysis the impact of terrorism on FDI inflow to Pakistan for the period 2001-2016. We applied OLS, ADF unit root, Cointegration analysis for the estimations and found that FDI inflow has adverse effect on FDI inflow in Pakistan. Government need to control the terrorist activities in country that might help to increase the FDI inflow to the country.

Keywords: FDI, Terrorism, Pakistan

#### INTRODUCTION

Foreign direct investment has key importance in the economic growth of every economy. The host country offers different incentive to boost up foreign direct investment in their countries. There are different factor that can affect the main determinants of foreign direct investment in an economy. Including taxes, interest rate, inflation, stability of exchange rate, beside peaceful environment is also perquisite for foreign direct investment inflow. If country don't have sound and peaceful environment it might lead to low the FDI inflow, because foreign investors will hesitate to invest their capital. Therefore a peaceful environment is the basic requirement for FDI inflow in an economy. Terrorism at local and international level disrupts foreign direct investment; domestic terrorism such incidents may dissuade FDI through enhanced risks associated with political instability. Moreover, these incidents can disrupt or destroy infrastructure, thereby limiting output from a given set of inputs [1]. The attacks from terrorist increase the cost of doing business, which decease the output from the input used in the production. The terrorist attacks its victims, targets affect two countries one is host country the other is the profit of foreign company that operates in host country. If terrorist attacks or bomb blast destroys the office of a foreign entrepreneur it comes under transitional terrorism, nevertheless both local and transitional terrorism has negative relationship foreign direct investment.

Pakistan has been on the threat of terrorism post 9/11, when US was attacked, As a result a military operation has been started in Afghanistan. Pakistan becomes non-NATTO ally, and gets access to most advanced military equipment. This alignment brought massive capital inflow in the form foreign aid and rescheduling the past debt. However, the negative aspect of was the emergence militant groups like of "Tehrik-i-Taliban Pakistan (TTP), which a militant movement against Pakistan army. TTP attacks on Pakistan's army in through different ways including suicide attacks. Here the graph shows the trend of FDI inflow and terrorist attacks in Pakistan.



Graph-1: Trend of Terrorist attacks and FDI inflow in Pakistan (Source: WDI and The Global Terrorism Database (GTD)

Initially after 9/11 terrorist attacks and FDI inflow both are increasing for Pakistan in 2001 and 2002, FDI decreased from 1.142 to 0.64 while attacks also decrease from 45 to 11 in 2003. Terrorist attacks and FDI inflow both are increasing trend till 2008. The terrorist attacks continue with this increasing trend till 2012 and start declining in 2013 and thereafter; this might occurred due to counter terrorism of Pakistani forces against the militant groups. While FDI inflow found to be increasing from 2003 till 2008 and thereafter start continuous declining trend till 2015. There is almost negative relationship between FDI inflow and terrorist attacks but it is worth mentioning that after 2007 the FDI inflow dramatically decreased. The main reasons for the dramatic declination of the FDI inflow after 2007 is the increase in terrorist attacks while another reason is energy crises. Although the last few years in this graphs shows government success against the militant group but it do not succeed to boost up FDI inflow into the country. Nevertheless in this study we only concern with terrorist attacks and other factors are left for the future research.

Since Pakistan badly by the terrorist attacks, therefore, this paper primarily examines the impact of terrorism on the FDI inflow in Pakistan for the period 2001 to 2016. This study has keen importance; it will highlight the most contemporary issue mean terrorism and its implication for the foreign direct investment. Since foreign direct investment play a key role in economic activities in an economy like Pakistan. Therefore it is desirable to test this phenomenon empirically.

#### LITERATURE REVIEW

Abadie and Gandeazaba [2] indicated that terrorist attacks affect the distribution of investment capital through the increase of uncertainty. Alomar and El-Sakka [3] found for the 136 less develop countries that terrorism has a negative and significant effect on foreign direct investment. Travers [17] pointed that terrorist activities affect development process in a country as the terrorist activities by collecting less tax revenues that may lead to financial problem in a country. Volker and Schumach [4] examined the FDI and economic growth for different countries for the period 1960 to 1993 and found that terrorist activities reduces FDI and economic growth all the included countries. James et al. [5] also studies economic growth, and foreign direct investment relationship with terrorism and his findings shows that terrorist attacks affect both private sector investment and foreign direct investment. They also found that FDI and economic growth has a mutually positive relationship. Shahbaz at el. [6] the impact of terrorism on FDI for the period 2000 to 2011 through OLS technique, they found a negative and significant relationship between terrorism and foreign direct investment implying that terrorist attacks reduce FDI inflow in Pakistan.

Hashmi [7] found that Pakistan involved in the war on terror in 2000 and receive enormous funds from funds from the USA, but this brings temporary improvement in the economy. But foreign direct investment tends to decline after this war due to the uncertainty of foreign investors.

Haider and Anwar [8] evaluated the effect of terrorism on FDI inflow, and they noted that terrorist attacks have badly affected the FDI inflow in Pakistan. Irfan-Ullah and Rahman [9] has examined the linkages between the terrorism and foreign direct inflow in Pakistan for the period 1995-2013. They found that terrorist attacks have a negative implication for the foreign direct investment in Pakistan. Overall the all past studies showed the negative association between foreign direct investment and terrorism.

### **Analytical Framework**

Following the Asiedu et al. [10] we consider a foreign firm that operating in a host country affected by terrorism. It produces output f (k) from capital, k, with given interest rate r. This firm might face output loss due the terrorist attacks or activities; which consequently leads to affect its revenues thus the profit of foreign firm can be written as

$$\pi = (1 - \tau)f(k) - rk, 0 < \tau < 1, f' > 0, f'' < 0,$$

Where  $\pi$  profit of the firm, (1- $\tau$ ) shows the output loss or fractional loss of firm due to the terrorist activities. However, these firms loss increased due to both domestic and transitional terrorism. The domestic and transitional terrorism can be shown through D and R respectively; as

$$\tau = D + R \,$$

Domestic (D) and transitional terrorism both are control or minimize its effect through counter-terrorism efforts as

$$D \equiv D(\lambda, E)$$
, where  $D_{\lambda} > 0$ ,  $D_{E} < 0$ , and  $D_{EE} > 0$ ; and ... (2)  $R \equiv R(\phi, E)$ , where  $R_{\phi} > 0$ ,  $R_{E} < 0$ , and  $R_{EE} > 0$ , ... (3)

Where  $\lambda$  and  $\phi$  represents the parameters shifts from domestic and transitional terrorist attacks for the firms. The equation (2) shows that domestic terrorism can reduce through counter-terrorism. The increase in  $\lambda$  will mean higher terrorist insurgency at any given pint of E and is also obvious from this equation that domestic terrorism can reduce through the E. In the equation shows the transitional terrorism and counter-terrorism (E) relationship; the increase the  $\phi$  will also mean the increase in terrorism at given level of E and terrorism can be reduced through counter-terrorism incentives. Now substituting the equation in (2) and (3) in the equation (xx)

$$\tau = D(\lambda, E) + R(\phi, E) = \tau(\lambda, \phi, E) \Rightarrow \tau_{\lambda} = D_{\lambda} > 0, \tau_{\phi} = R_{\phi} > 0, \text{ and}$$

$$\tau_{E} = D_{E}(\lambda, E) + R_{E}(\phi, E) < 0, \tau_{EE} = D_{EE}(\lambda, E) + R_{EE}(\phi, E) > 0.$$
(4)

This equation indicates the total terrorism increases with increase in  $\lambda$  and  $\phi$ , while decline with E or counter-terrorism. Now let assume that government that faces the problem of terrorism put a specific amount of revenue received from the foreign firm to meet the expenses of terrorism. This weight may derive from a tax-revenue collection motive or from other equally relevant motives associated with FDI [10, 1]. Here we assumed that these factors that as exogenous and indeed the host country that affected from the terrorism are receive aid (A) from the external sources, which assumed to hold a constant marginal cost of counter-terrorism se at unity. Thus the aid receiving country payoff is

$$V = \theta(1 - \tau)f(k) + A - E. \tag{5}$$

It is observed that the aid has been increased after the delectation of war on terrorism in 2001 see [11, 12]. Now to capture the capture the increase in the aid related to counter-terrorism can be further divided into two categories one is general aid and other is counterterrorism-tied aid as

$$A = \beta + \gamma E, \, \beta > 0, \, 0 < \gamma < 1, \tag{6}$$

Here in the above equation  $\beta$  shows the general aid while the  $\gamma E$  shows the aid related to the counterterrorism; using equation (1), (4) and equation (6) in equation will get as

$$V = \theta[1 - \tau(\lambda, \phi, E)]f(k) + \beta + (\gamma - 1)E. \tag{7}$$

Here at the first stage host country that faces terrorism chooses E at first stage while chooses K in the second stage. The model is then solved through backward induction as

$$(1-\tau)f'(k)-r=0,$$
 (8)

The strict concavity of f(k) confirms that the second-order condition is satisfied. And suppressing r from the functional form, eq. (8) defines

$$k = k(\tau), \frac{dk}{d\tau} = k_{\tau} = \frac{f'}{(1 - \tau)f''} < 0.$$
 (9)

This indicates the terrorism reduces FDI, k. The host country -aid receiving country's government choice in first stage; substituting equation (4) and (9) in equation (7) we get

$$V(E; \theta, \lambda, \phi, \beta, \gamma) \equiv \theta[1 - \tau(\lambda, \phi, E)] f\{k[\tau(\lambda, \phi, E)]\} + \beta + (\gamma - 1)E.$$
 (10)

Now we find the optimal choice for the counterterrorism effort as

$$\frac{\partial V}{\partial E} = V_E(E; \lambda, \phi, \gamma) = \theta \tau_E [(1 - \tau)f'k_\tau - f] + \gamma - 1 = 0, \tag{11}$$

Now the second order conditions can be satisfied, and equation (11) can form as

$$E = E(\lambda, \phi, \gamma) \tag{12}$$

Substituting equation (4) and (12) into equation. (9), we have

$$k = k[\tau\{\lambda, \phi, E(\lambda, \phi, \gamma)\}] = k(\lambda, \phi, \gamma). \tag{13}$$

The equation (13) shows that how the domestic or transnational terrorism or domestic terrorism ( $\lambda$ ,  $\phi$ ) increases; or how exogenous rise in the counter terrorism aid increase ( $\gamma$ ) affects the foreign direct investment. It also has been shown that how marginal effect of the domestic and transitional terrorism effect with an increase of foreign aid. The comparative static analysis shows following outcomes

$$k_{\lambda} = k_{\tau}(\tau_{\lambda} + \tau_{E}E_{\lambda}) < 0$$
, if  $D_{E\lambda} > \frac{D_{\lambda}\tau_{EE}}{\tau_{E}}$ , where  $E_{\lambda} = \frac{\partial E}{\partial \lambda}$ . (14a)

Here with given  $k_{\tau}$  is negative and the sign of  $k_{\lambda}$  is primarily depended on right-hand side the included parentheses in the equation. In this equation,  $\lambda$  capture the total effect of terrorism risk  $\tau$ , which is composed to direct effect  $\tau_{\lambda}$  and indirect effect is presented by  $\tau_{E}E_{\lambda}$ . As it has been shown that direct effect is positive, while indirect effect may reduce the terror risk. If, in particular, enforcement rises in response to an increase in  $\lambda$  it helps to contain the risk of terrorism while in case when the direct effect dominates, the risk of terrorism must rise with  $\lambda$ , leading to a fall in FDI [1]. In equation (4) it condition has mentioned for the dominance as  $D_{E\lambda} \geq 0$ . If it is the case and direct effects dominate it will lead to reductions of FDI while in case if the direct effect does not dominate  $D_{E\lambda} < 0$  then it might not affect FDI. The dominance condition thus stratified only when

$$|D_{E\lambda}| < \frac{D_{\lambda} \tau_{EE}}{|\tau_{E}|}. \tag{14b}$$

Similarly, for transnational terrorism, we have

$$k_{\phi} = \frac{dk}{d\phi} = k_{\tau} \left( \tau_{\phi} + \tau_{E} E_{\phi} \right) < 0 \text{ iff } R_{E\phi} > \frac{R_{\phi} \tau_{EE}}{\tau_{E}}, \text{ where } E_{\phi} = \frac{\partial E}{\partial \phi}.$$
 (15)

Similarly, in case of domestic terror, FDI is necessarily reduced when transnational terror  $R_{E\phi} \ge 0$ , by comparing the effect of domestic and transnational terrorism on FDI it necessary to have critical effect is

$$R_{\phi} > D_{\lambda} \text{ or } R_{E\phi} > D_{E\lambda}.$$
 (16)

If both conditions are satisfied in the above equation, then transitional terrorism may have a stronger marginal effect. This first condition requires that raise the foreign firms affected more from the transitional as compare to domestic terrorism. While the second the condition states satisfied that that to reduce either marginal effectiveness of enforcement or increase to lesser degree by transitional terrorism.

The effect of aid parameter  $\gamma$  as

$$k_{\gamma} = \frac{dk}{d\gamma} = k_{\tau} \tau_E E_{\gamma} > 0$$
, where  $E_{\gamma} = \frac{\partial E}{\partial \gamma} > 0$ . (17)

The above equation indicated the enforcement through tied aid will benefit FDI and thus minimize the effect of terrorism. Now showing the effect aid parameters on  $k_{\lambda}$  and get

$$\frac{d|k_{\lambda}|}{d\gamma} = -(\tau_{\lambda} + \tau_{E}E_{\lambda})k_{\tau}'\tau_{E}E_{\gamma} - k_{\tau}D_{\lambda E}E_{\gamma} - k_{\tau}\frac{d(\tau_{E}E_{\lambda})}{d\gamma}, \text{ where } k_{\tau}' = \frac{dk_{\tau}}{d\tau}.^{2}$$
 (18a)

It is assumed that right-hand side term is negative in the equation (18a), but the  $D_{\lambda E}$  can either be positive negative or zero. How in case when  $D_{\lambda E}=0$  the second order approximation of the V (.) in the equation (18a) can reduce as

$$\frac{d|k_{\lambda}|}{d\gamma} = (fk_{\tau}' - f'k_{\tau}^2)Z < 0, \text{ where } Z = \frac{\theta \tau_{EE} E_{\gamma} D_{\lambda} \tau_{E}}{V_{EE}} > 0.$$
 (18b)

The equation 18b shows the aid reduces the adverse effect of domestic terrorism on the FDI flow and the same conclusions are assumed for the transitional terrorism case.

## RESEARCH METHODOLOGY

I will use this model for the data analysis, most of the explanatory variables the primary determinants of foreign direct investment.

 $FDI = f(GDP, L, K, EX, AT)Ut \qquad \dots (19)$ 

Where

FDI – foreign direct investment GDP – gross domestic production

 $L-labor\ force$ 

Ex- exchange rate

AT – terrorist attacks

Ut is the error term

This model will analyze through conventional OLS approach, unit root analysis, Cointegration and Causality test. The OLS estimation usually not considers a better estimator in contemporary empirical due to spurious results if used the time series data. The problem arises due to non statationary of data, thus Dickey Fuller [13] and Augmented Dickey-Fuller [14]. The latter is the modified form of former. DF test can be tested through following equations

$$\begin{array}{c} \Delta \ Y = \gamma Y t \text{-}1 + \epsilon t . & (20) \\ \Delta Y = \beta 0 + \gamma Y t \text{-}1 + \epsilon t & (21) \\ \Delta Y = \beta 0 + \beta 1 i + \gamma Y t \text{-}1 + \epsilon t & (22) \\ \end{array}$$
 While ADF unit root test include augmentation to the equation – 4 as 
$$\Delta Y t = \beta 0 + \beta 1 i + \gamma Y t \text{-}1 + \Sigma \beta i \ Y t \text{-}\rho + \epsilon \ t & (23) \\ \end{array}$$

In all of these equations  $\gamma$  is tested, if  $\gamma=0$  mean stationary property of data, alternatively  $\gamma>0$  this will implies that data has unit root implying the non-stationary of data. Cointegration will be applied for the long run relationship among the variables. There are two test one in Engel and Granger [15] and other is Johansen approach [17] however the Engel and Granger test do not give information about the cointegrating vectors while Johansen approach provide information regarding the number of cointegrating vectors and due this feature I will prefer to use the Johansen approach. Since conintegration only provide information regarding the number of cointegrating vectors, therefore, standard Granger causality will be tested to know the casual relationship. Data for GDP, FDI, EX, L and K are obtained from World Bank Development Indicators. While data for the terrorist attacks (AT) is obtained form The Global Terrorism Database (GTD).

#### RESULTS AND OUTCOMES

Table -1: OLS results

| Table -1. OLS results                       |             |                        |             |          |  |  |
|---|-------------|------------------------|-------------|----------|--|--|
| Dependent Variable: FDI                     |             |                        |             |          |  |  |
| Method: Least Squares                       |             |                        |             |          |  |  |
| Sample (adjusted): 2001Q                    | 4 2016Q4    |                        |             |          |  |  |
| Included observations: 61 after adjustments |             |                        |             |          |  |  |
| Variable                                    | Coefficient | Std. Error             | t-Statistic | Prob.    |  |  |
| С   | -107.1154   | 19.24674               | -5.565377   | 0.0000   |  |  |
| AT  | -0.472513   | 0.095447               | -4.950535   | 0.0000   |  |  |
| EX  | -8.685394   | 0.691210               | -12.56550   | 0.0000   |  |  |
| GDP   | 4.897920    | 0.404672               | 12.10344    | 0.0000   |  |  |
| K   | 0.282567    | 0.107384               | 2.631379    | 0.0110   |  |  |
| L   | 3.278491    | 2.541568               | 1.289948    | 0.2025   |  |  |
| R-squared                                   | 0.804464    | Mean dependent var     |             | 21.22201 |  |  |
| Adjusted R-squared                          | 0.786687    | S.D. dependent var     |             | 0.694879 |  |  |
| S.E. of regression                          | 0.320935    | Akaike info criterion  |             | 0.658024 |  |  |
| Sum squared resid                           | 5.664961    | Schwarz criterion      |             | 0.865651 |  |  |
| Log likelihood                              | 14.06975    | Hannan-Quinn criteria. |             | 0.739395 |  |  |
| F-statistic                                 | 45.25549    | Durbin-Watson stat     |             | 0.207089 |  |  |
| Prob(F-statistic)                           | 0.000000    |                        |             |          |  |  |

Table -1 shows primary OLS results, As FDI is taken dependent variable while terrorist attacks or terrorism (AT), exchange rate (EX), GDP, Investment, and labor is taken as independent variables. The OLS outcomes show that terrorist attacks (AT) has a negative and significant association with FDI as one increase in terrorist attacks lead to decrease 0.47 FDI this means that terrorist attacks are the main hurdle in FDI inflow in Pakistan. The exchange rate also shows that negative and significant and one percent currency devaluation leads to decrease the FDI by -8.68 percent. GDP, however, has a positive relationship with FDI and one percent increase in GDP of the country lead to increase the FDI inflow by 4.89 percent. Similarly the investment (K) has a positive association with FDI inflow and one percent increase in investment increase FDI by 0.28 percent in the country this shows that FDI has hold crowd in effect and it

boost up local investment. While labor (L) hold a positive sign for the FDI inflow as one percent increase in labor increase FDI by 3.2 percent but due to the insignificant sing its role is negligible. Other estimations including F- statistics shows the model is correctly specified and all including variables is jointly determining the FDI inflow. R<sup>2</sup> shows that 80 percent of variations independent variable come to the included explanatory variables while the rest is coming is error term. Since the value of DW statistics is very low so the model might suffer from the stationary problem, however, we will apply ADF unit root test, Cointegration and causality for further robustness.

#### **ADF** unit root

Table-2: ADF unit root

| Variable | At level    | at 1 <sup>st</sup> Difference | Conclusions                              |
|----------|-------------|-------------------------------|--|
| FDI      | 0.128634    | -3.088922                     | Non stationary at level                  |
|          | (-0.128634) | (-1.946447)                   | Stationary at 1 <sup>st</sup> difference |
| GDP      | 1.460717    | -2.506807                     | Non stationary at level                  |
|          | (-1.946878) | (-1.946878)                   | Stationary at 1 <sup>st</sup> difference |
| K        | -1.177931   | -2.740720                     | Non stationary at level                  |
|          | (-1.947248) | (-1.947248)                   | Stationary at 1 <sup>st</sup> difference |
| L        | 0.433055    | -3.754339                     | Non stationary at level                  |
|          | (-1.946878) | (-2.915522)                   | Stationary at 1 <sup>st</sup> difference |
| AT       | -1.093313   | -4.987031                     | Non stationary at level                  |
|          | (-3.546099) | (-2.911730)                   | Stationary at 1 <sup>st</sup> difference |
| EX       | -1.469276   | -3.123318                     | Non stationary at level                  |
|          | (-2.919952) | (-2.919952)                   | Stationary at 1 <sup>st</sup> difference |

The second table shows the ADF unit root results and it shows that all variables are non-stationary at level while become stationary after 1<sup>st</sup> difference. This indicates that all variables are holding the same order of integration and thus fulfill the requirement for the coinegration.

## **COINTEGRATION RESULTS**

**Table-3: Cointegration Results** 

| Sample (adjuste  |  | 604       | 11054105       |         |  |  |
|--|--|-----------|----------------|---------|--|--|
|  | Sample (adjusted): 2002Q3 2016Q4 Included observations: 58 after adjustments |           |                |         |  |  |
| Trend assumption   |  |           |                |         |  |  |
|  | Series: AT EX FDI GDP K L  |           |                |         |  |  |
| Lags interval (ir  |  |           |                |         |  |  |
| Unrestricted Co.   |  |           |                |         |  |  |
| Hypothesized   |  | Trace     | 0.05           |         |  |  |
| No. of CE(s)   | Eigenvalue   | Statistic | Critical Value | Prob.** |  |  |
| None *   | 0.634648   | 140.5667  | 95.75366       | 0.0000  |  |  |
| At most 1 *  | 0.502584   | 82.16676  | 69.81889       | 0.0038  |  |  |
| At most 2  | 0.280997   | 41.66372  | 47.85613       | 0.1684  |  |  |
| At most 3  | 0.211076   | 22.53014  | 29.79707       | 0.2699  |  |  |
| At most 4  | 0.126182   | 8.779160  | 15.49471       | 0.3862  |  |  |
| At most 5  | 0.016347   | 0.955956  | 3.841466       | 0.3282  |  |  |
| Trace test indicates 2 cointegrating eqn(s) at the 0.05 level          |  |           |                |         |  |  |
| * denotes rejection of the hypothesis at the 0.05 level                |  |           |                |         |  |  |
| **MacKinnon-   |  |           |                |         |  |  |
| Unrestricted Cointegration Rank Test (Maximum Eigenvalue)              |  |           |                |         |  |  |
| Hypothesized   |  | Max-Eigen | 0.05           |         |  |  |
| No. of CE(s)   | Eigenvalue   | Statistic | Critical Value | Prob.** |  |  |
| None *   | 0.634648   | 58.39990  | 40.07757       | 0.0002  |  |  |
| At most 1 *  | 0.502584   | 40.50304  | 33.87687       | 0.0070  |  |  |
| At most 2  | 0.280997   | 19.13358  | 27.58434       | 0.4042  |  |  |
| At most 3  | 0.211076   | 13.75098  | 21.13162       | 0.3858  |  |  |
| At most 4  | 0.126182   | 7.823204  | 14.26460       | 0.3969  |  |  |
| At most 5  | 0.016347   | 0.955956  | 3.841466       | 0.3282  |  |  |
| Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level |  |           |                |         |  |  |
| * denotes rejection of the hypothesis at the 0.05 level                |  |           |                |         |  |  |
| **MacKinnon-Haug-Michelis (1999) p-values                              |  |           |                |         |  |  |

Cointegration test contains shows trace statistics, and maximal eigen value and its results show the existence of one cointegrating vector both trace and statics. Since cointegration results do not provide mutual interaction between the variables, therefore we apply standard Granger Causality test.

## **Granger Causality test**

**Table-4: Granger Causality test** 

| Pairwise Granger Causality Tests | Granger Caus | sunty test  |        |
|----------------------------------|--------------|-------------|--------|
| Sample: 2001Q1 2016Q4            |              |             |        |
| Lags: 3                          |              |             |        |
| Null Hypothesis: Obs             |              | F-Statistic | Prob.  |
| EX does not Granger Cause AT     | 58           | 0.46678     | 0.7067 |
| AT does not Granger Cause EX     |              | 1.94873     | 0.1335 |
| FDI does not Granger Cause AT    | 58           | 0.52071     | 0.6700 |
| AT does not Granger Cause FDI    |              | 0.43660     | 0.7278 |
| GDP does not Granger Cause AT    | 58           | 2.81515     | 0.0483 |
| AT does not Granger Cause GDP    | '            | 0.09914     | 0.9601 |
| K does not Granger Cause AT      | 58           | 0.02822     | 0.9935 |
| AT does not Granger Cause K      |              | 0.92352     | 0.4362 |
| L does not Granger Cause AT      | 58           | 0.57679     | 0.6329 |
| AT does not Granger Cause L      | ·            | 0.20401     | 0.8931 |
| FDI does not Granger Cause EX    | 58           | 1.41559     | 0.2489 |
| EX does not Granger Cause FDI    |              | 0.29261     | 0.8305 |
| GDP does not Granger Cause EX    | 58           | 3.91835     | 0.0136 |
| EX does not Granger Cause GDP    |              | 1.22465     | 0.3103 |
| K does not Granger Cause EX      | 58           | 0.08626     | 0.9673 |
| EX does not Granger Cause K      |              | 1.54813     | 0.2134 |
| L does not Granger Cause EX 58   |              | 2.91566     | 0.0430 |
| EX does not Granger Cause L      |              | 0.59926     | 0.6184 |
| GDP does not Granger Cause FDI   | 58           | 0.17592     | 0.9122 |
| FDI does not Granger Cause GDP   |              | 0.97873     | 0.4101 |
| K does not Granger Cause FDI     | 58           | 0.02452     | 0.9947 |
| FDI does not Granger Cause K     |              | 0.06884     | 0.9763 |
| L does not Granger Cause FDI     | 58           | 0.96017     | 0.4187 |
| FDI does not Granger Cause L     |              | 1.51743     | 0.2211 |
| K does not Granger Cause GDP     | 58           | 0.23291     | 0.8730 |
| GDP does not Granger Cause K     |              | 1.42572     | 0.2460 |
| L does not Granger Cause GDP 58  |              | 0.68360     | 0.5662 |
| GDP does not Granger Cause L     | 1.68108      | 0.1827      |        |
| L does not Granger Cause K       | 58           | 0.48048     | 0.6973 |
| K does not Granger Cause L       |              | 0.57496     | 0.6341 |

The Table -4 shows the results for the Granger causality test, and it shows that terrorist attacks cause FDI this supports the results of OLS findings and thus concluded that terrorist activities are decreasing the FDI inflow in Pakistan.

## CONCLUSION

This paper analyzed the terrorism and FDI in Pakistan; since Pakistan was the main partner in War on terror after 9/11, the participation merged high level in of terrorist activities in the country. This affected both local and foreign direct investment, loss of output, damaged infrastructure, security cost. We use Asiedu et al. [10] and Bandyopadhyay et al [1] theoretical model that negative linkage between FDI and terrorism. Time series data is used for the empirical estimations; for the empirical estimations, we applied FDI as dependent variable while terrorist attacks, labor, investment, GDP and exchange rate are taken as independent variables. The study uses OLS, ADF unit root test and cointegration test for the empirical estimations. The primary OLS results show that terrorist attacks has a negative effect on FDI and it decreases the FDI inflow to the country, and recent statistics also shows the FDI inflow start declining after 9/11. Capital (local investment) is holding positive association this implies that FDI inflow has the crowd in effect and it boosts up local investment. While labor is found insignificant, this might indicate that most of the FDI contain higher technology that does not require a high level of labor. Exchange hold a negative coefficient which imply that exchange

rate has a contractionary effect on the economy and hence it also negatively affecting economic growth. GDP has positive effect on FDI as higher growth can absorb higher level of FDI. This has been checked through robust of cointegration and causality tests and they verified the OLS findings. In concluding remarks, this study suggests that government need to control terrorism; which might help to boost up the FDI inflow in the country. There is also need to improve infrastructure especially to control the energy crises.

**Acknowledgement:** This paper is a part of - "Innovative Research Project for International Graduate" program; financed by Zhongnan University of Economics and Law, Wuhan, China

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