MPRA

Do Workers' Remittances Increase Terrorism? Evidence from South Asian Countries

Raza, Syed Ali and Shah, Nida and Khan, Waqas Ahmed

IQRA University, IQRA University, IQRA University

2017

Do Workers' Remittances Increase Terrorism? Evidence from South Asian Countries

Abstract:

Purpose of this paper	This study investigates the influence of workers' remittances on terrorism in 5 South Asian countries.
Design/methodology/approach	The panel data comprised of 20 years from the period of 1994 to 2013 is used. The advanced econometric techniques i.e, CIPS unit root test, bootstrap cointegration, Pedroni co-integration, FMOLS, fixed effect model and heterogeneous panel causality technique have been applied.
Findings	The results suggest that the workers' remittances have a significant positive impact on the terrorism in South Asian countries. The results also indicate that the control variables, i.e., Inflation, unemployment, and population size also have a significant positive relationship with terrorism. The result of causality shows that unidirectional causality exists of remittance, population, and inflation with unemployment, however, bidirectional causality exists between unemployment and terrorism.
Research limitations/implications	The sample size is restricted to South Asian countries only so the result cannot be generalized to other countries.
Practical implications	This study will help the policymakers of the region, to make necessary amendments in law so that remittance amount does not be accessible to the group to use in terrorist activities.
Originality/value	On a larger perspective, only two studies have been carried out that examines the relationship between terrorism and remittance. One study is conducted in the sub-Saharan region by Elu and Price (2011), and the other one is conducted on panel data by Mascarenhas and Sandler (2014). No study to the best of our knowledge has been done in the South Asian context, so this study is conducted to analyze the impact of workers' remittance on terrorism in South Asian countries.

1. Introduction

The 9/11 incident shaken the whole globe and resulted in a campaign of the fight against terrorism. As the terrorist groups were having connections with Al-Qaida (Muslim extremists), the war against terrorism was started against the whole South Asia, especially Afghanistan and Pakistan (Abuza, 2002). There were many banned terrorist groups found all over the South Asian countries (Krondtadt &Vaughn, 2004). The presence of transnational terrorist groups and their supporters in South Asia is a real threat to both regional stability and the whole world.

Terrorism is the hot discussion of the whole world as it puts the whole world in great threat. A number of people become homeless, lose their families, critically injured and dead throughout the world (Ullah, Rahman, Jebran & Zeb, 2014). Loss of lives, destruction of houses are not only the consequences of terrorism, but they also affect the economy, significantly. The macroeconomic indicators, i.e. Inflation, unemployment get greatly affected by the terrorist activities (Freytag, Krüger, Meierrieks & Schneider, 2011) and uncertain environment of the country forces number of people to migrate to foreign countries to fulfill the basic needs of their families.

Terrorism is basically an act of aggression done intentionally to create fear and to fulfill their goals which can be economic, religious, political, or ideological and in which the targeted audience can be the general public or to disregard the safety of non-combatants (Caruso, 2014). It is the violent behavior against people or property to threaten or coerce a government or the civilian, or any segment thereof, for the achievement of political or social objectives. Typically, the terrorist act consists of unexpected attacks on civilians, including attacking embassies, hijacking, and kidnapping with the aim in mind, to create fear and confusion (Gaibulloev & Sandler, 2009). In a broader sense, terrorist activities are of two types i.e. Domestic level and international level.

Domestic terrorism is the country directed act in which the executor (terrorist group) targets the person of his own country. In Pakistan, the recent attack on Army Public School Peshawar on 16 December 2014 whereas, on 12th April 2014, two bomb explosion during the voting in the general election of East India were examples of domestic terrorism. On the contrary, international terrorist incidents involve two or more countries in which the executor (terrorist group) targets the other nationalities living in the country or do terrorist activities in other countries. 9/11 incident in America is the example of international level terrorism (Mascarenhas & Sandler, 2014). There are many ways in which terrorist groups and terrorist attacks are financed which include liberation money, migration contributions, state sponsorship, robberies, other criminal activities, and remittances (Mascarenhas & Sandler, 2014).

Among all, remittance is considered to be one of the major sources of terrorism funding (Mascarenhas & Sandler, 2014) but at the same time, it plays an important role to improve the economic performance of the economy (Rahman, 2014). Remittance is the amount which is sent by the person from the host country to the home country (Al-Assaf & Al-Malki, 2014).

Remittance transfer can be formal and informal. The formal channel includes the banks and money exchange; whereas informal channel includes hundi or through friends or family visiting their country (Sander &Maimbo, 2005). The motive behind remitting can be negative or positive. The positive motives behind remitting imply that migrants transfer money in order to support their relatives and to protect them from any direct or indirect financial losses or to do saving in terms of investment in their country (Mughal & Anwar, 2015). Conversely, the negative motive behind remitting can be to support the terrorist or extremist groups in the home country (Mascarenhas & Sandler, 2014).

The role of remittance to support terrorist activities is high. It has been observed that a positive relationship exists between remittance and terrorism, which means an increase in the remittance flow in the country will increase the terrorist activity in the economy. Approximately 3.2% of domestic terrorist events occur in the country if the lagged remittance/GDP is increased by 1 % (Mascarenhas & Sandler, 2014). However, another study claimed that each million dollars of workers' remittances backup about one terrorist incident (Elu & Price, 2011).

The main objective of this study is to analyze the linkage between the terrorism and remittance in South Asian countries. South Asian countries are considered to be the most popular and important region in the world, but at the same time are among the most terrorism affected countries (Ali & Le, 2016). In these countries, the rate of recurrence of terrorist incidents, the strength of terrorist activity and flow of remittance all are significant. According to the Global Terrorism Database (GTD), in the year 2013, total numbers of terrorism events were 3161 in which 83 attacks were suicidal, almost 3354 people were dead and 6771 people were wounded. Whereas from the years 1994 till 2013, total numbers of terrorism events were 17679 in which 509 attacks were suicidal, almost 36226 people were dead and 66072 people were wounded. The remittance inflows of the South Asian countries are $ 870387 million in the year of 2013.

Despite the fact that the terrorist activities and its funding are the most important issue, this relationship does not give due consideration. On a larger perspective, only two studies have been carried out that examine the relationship between terrorism and remittance. One study is conducted in the sub-Saharan region by Elu and Price (2011), and the other one is conducted on panel data by Mascarenhas and Sandler (2014). No study to the best of our knowledge has been done in the South Asian context, so this study is conducted to analyze the impact of workers' remittance on terrorism in South Asian countries. This study will help us to identify whether the increase in terrorist activity is due to the remittances flow in the economies or whether remittance is the major source of financing terrorist activity in the South Asian countries. This study is also beneficial for the policy makers of the countries because this work will help them to identify the actual effect of remittance and how it should be controlled. In addition to this, it will help them to decide which policies to be made, the policy which encourages remittances or those policies which strict the remittance flow.

The rest of the paper will be as follows: Section 2 present the literature review, Section 3 shows the methodology, data analysis is presented in Section 4 and Section 5 shows the conclusion and recommendations.

2. Literature Review

2.1 Theoretical Background:

In 1985, the Lucas and Stark explain the determinants of remittances at the household level and identify pure altruism, pure self-interest, tempered altruism or enlightened self-interest as the main determinants. The remittances are increased with the altruism and migrant income, whereas decreased with recipient income (Funkhouser, 1995). In contrast to altruism, the other motivation factor to remit is self-interest.

The economic outcomes of war and conflicts are analyzed by different Economists (Keynes, 1919; Robbins, 1942). According to the economists, the vast difference exists between conflict and terrorism. Any incident can be considered as terrorism when there exists any motive related to religion, politics or ideology (Enders and Sandler, 1995).

Previously, to study the effect of terrorism on the countries two models were proposed. Each model focuses specific factors and networks through which terrorism disturbs the economic conditions. The first model was given by Eckstein and Tsiddon (2004). This model is known as a closed economy because it hypothesizes the total discount rate to understand the decline in macroeconomic factors and income of the countries. The other model was given by Abadie and Gardeazabal (2008) referred as AG (2008). This model is known as an open economy model and hypothesizes capital outflow to interpret the effect of macroeconomic variables on the countries. In other words, the Eckstein and Tsiddon (2004) model, embrace closed economy structure, whereas AG (2008) model embrace perfect capital mobility.

Remittance can be used in different ways, but in past studies, it has been reported that the remitted funds are used in two ways (i) current consumption, (ii) asset accumulation, to cover the living expenses and to ensure the savings and investment (Brown, 2006; Taylor, 2004). Most of the studies in past literature have focused on the remittance role as a contributor to the development and its advantages for the local people (Russell, 1992; Taylor, 1999). However, the remittance role in funding terrorism and financial crime rather than in development was identified after the 9/11 and the subsequent "War on Terror". This controversial side of remittance that acts as a funding for terrorism were used in the studies of Elu & Price (2011); Mascarenhas & Sandler, (2014). We developed our theoretical model on the basis of these studies to examine the association between the terrorism and remittance in the south Asian countries.

2.2 Empirical Evidences

2.2.1 Remittance and Terrorism:

Elu and Price (2011) examine the role of remittance in financing terrorism by applying the generalized estimating equation on the dataset of sub-Saharan Africa. The data comprised of the years 1970 -2006. Their study claimed that each million dollars of workers' remittances backup about one terrorist incident. Another work on terrorism and remittance association are done by Mascarenhas and Sandler (2014). They applied the Negative Binomial panel regression model on the dataset of 138-142 countries and reported that a significant positive relationship exists between remittance and terrorist attacks (both domestic and transnational). However, their results from venue point of view suggested that remittance effects domestic terrorism more than

transnational terrorism. Furthermore, remittances send to the home country of the perpetrator, shows that they affect transnational terrorism more than domestic events. Løvlien (2014) reported that positive association exits between the remittance inflows and transnational terrorism whereas no significant association exists between the remittance inflows and domestic terrorism. Mughal and Anwar (2015) examine the determinants of remittances in Pakistan by applying the ARMAX model, Augmented Dickey-Fuller (ADF) and Phillip Pearson (PP) tests on the monthly data from January 2003 to October 2012. The result indicates that a significant positive relationship exists between the two variables and concluded that each terrorist activity encourages migrant to remit more remittance to the country.

2.2.2 Population, Unemployment, Inflation (Control Variables) and Terrorism:

Richardson (2011) uses the relative deprivation theory and concluded that high unemployment rate and population size upsurges the terrorism in under-examined 56 countries. Freytag, Krüger, Meierrieks and Schneider (2011) explore the socioeconomic determinants of terrorism by applying the Negative binomial regression model on the dataset of 110 countries between 1971 and 2007. They concluded that poor socioeconomic conditions encourage terrorist activities and hence both are negatively correlated. The same study is also done by Caruso and Schneider (2011) on the dataset of 12 countries of Western Europe. They reported that larger the job opportunities and better the economic situation of the country available for an individual, the lower will be their willingness to be involved in terrorist actions.

Benmelech *et al*., (2012) reported that the high unemployment rate increases all the three times of terrorist attacks in the venue country. Mehmood (2013) explored the relationship between terrorism and the macroeconomy of Pakistan by applying the Quasi-Structural vector autoregression, VECM, Impulse Response Functions, and Granger-Causality tests on the data set comprising of the years 1973-2010. The result indicates that the terrorism incidents affected the Pakistan real national income about 33.02%. Moreover, terrorism affects the real GDP growth per capita of Pakistan by 1% every year. Shahbaz and Shabbir (2011) used the yearly data of Pakistan and report the existence of bi-directional causality between the inflation and terrorism. Shahbaz (2013) studied the connection between the inflation and terrorism in Pakistan. The outcome of ARDL approach shows that the positive association exists between the variables. Moreover, the bi-directional causal relationship exists between the inflation and terrorism.

Ismail and Amjad (2014) also examined the relationship between terrorism and macroeconomic indicators of Pakistan and found that the long-run relationship exists between the variables. Moreover, two-way causality exists between terrorism and inflation, whereas unidirectional causality exists between GDP per capita and terrorism, unemployment, and terrorism, GDP growth, and terrorism. Santifort-Jordan and Sandler (2014) also mentioned that increase in unemployment also increase the suicide attacks in the under examined countries. Akhmat *et al*., (2014) examined the root causes in the south Asian countries by using the data from 1980-2011. They reported that population growth and unemployment has a significant positive effect on terrorism. Ali and Le (2016) studied the economic factors and terrorism link in the context of Pakistan and reported that population density and unemployment has a significant positive association with terrorism. Okafor and Piesse (2017) studied the determinants of terrorism in fragile states and reported that positive association exists between the youth unemployment and

terrorism, whereas remittance has a negative effect on terrorism. However, Piazza's (2006) mentioned that no significant association exists between the unemployment and terrorism.

3. Methodology

The present study explores the role of workers' remittance, population, inflation and unemployment on terrorism. The dataset is based on a panel of 5 South Asian countries, i.e., Pakistan, India, Bangladesh, Nepal and Sri Lanka from the years 1994-2013 based on the availability of data. All the data are extracted from the official website of the World Bank except for terrorism. The terrorism data is acquired from GTD database managed by the National Consortium at University of Maryland, US. After reviewing the empirical studies, the model to analyze the relationship between workers' remittances, inflation rate, unemployment rate, population size and terrorism in South Asian countries is determined by following functions:

$$TER_{i,t} = \alpha_0 + \beta_1 REM_{i,t} + \beta_2 UNE_{i,t} + \beta_3 INF_{i,t} + \beta_4 POP_{i,t} + \varepsilon_{i,t}$$

In the above model, i represent the number of countries in the panel and t represents the number of observations over time. TER is the terrorist incidents, REM is the workers' remittances, *UNE* is the unemployment rate, INF is the inflation rate, POP is the population size and ε is the error term. The detailed description of all variables is presented in table-1.

-Insert table 1 Here-

The descriptive statistics related to the data used for the analysis are reported in table 2. The results in table 2 show that the minimum terrorist incidents occur are 0 and the maximum terrorist incidents occur are 2213, with a mean value and standard deviation of 176.8 & 326.2. The highest value of remittance 0.29% of GDP and the minimum value is 0.01% of GDP. The mean value was 0.06 with the standard deviation of 0.06% of GDP. The value of the population shows the maximum value is 1252.1 Million and the minimum value 17.9 Million with a mean and standard deviation of 287.0 & 414.3. The mean value of inflation (INF) is 8.1% with a standard deviation of 4.2 and minimum and maximum values of 2.5% and 24.9% respectively. The maximum value of unemployment is 13.0% and the minimum value is 1.8 with a mean of 4.8% and standard deviation 2.2%.

-Insert table 2 Here-

Estimation Techniques:

The statistical techniques we have employed in this study are panel techniques. Firstly the stationary properties of the variables are analyzed. The stationary properties of the variables can be analyzed by using a variety of panel unit root techniques which can be Hadri (2000); Breitung (2000); Levin *et al.*, (2002), and Lluis Carrion-i-Silvestre *et al.*, (2005). The autoregressive description for this can be considered as:

$$y_{it} = \rho_i y_{it-1} + \delta_i X_{it} + \varepsilon_{it} \qquad (i)$$

In the panel data models, the recognition of parameter heterogeneity is of great importance, to avoid the potential biases which may occur due to inappropriate specification. To overcome the parameter heterogeneity the Im, Pesaran and Shin (2003) technique is used to check the stationary properties of the variables. This technique is employed because it allows the heterogeneous autoregressive coefficients. The problem of heterogeneity may occur in our study due to the difference in each country. The Im et al. (2003) averages the augmented Dickey-Fuller (ADF) unit root test and allow the different orders of serial correlation.

$$\varepsilon_{it} = \sum_{j=1}^{\rho_i} \varphi_{ij} \, e_{it-j} + \mathcal{U}_{it} \quad (ii)$$

The substitution of EQ (i) into EQ (ii) generates the below equation:

$$y_{it} = \rho_i y_{it-1} + \sum_{j=1}^{\rho_i} \mathcal{U}_{ij} \, e_{it-j} + \delta_i X_{it} + \mathcal{U}_{it} \quad (iii)$$

In equation (iii) the Pi shows the number of lags in the ADF regression. The null hypothesis (H0) for the unit root analysis is that each individual series in the Panel is non -stationary (H0: ρi =1∀i) whereas, the alternative hypothesis (H1) is that the individual series in the Panel is stationary (H0: ρi < 1).

The second generation unit root test is also applied to the data because if the cross-sectional dependence is found among the variables than the first generation unit root become no longer valid (Alam *et al*., 2016; Paramati *et al*., 2016). In order to check the cross-dependence, the CD test given by Pesaran (2004) is applied because if the cross-sectional dependency is ignored it may cause biased results (Pesaran, 2004). The null hypothesis for this test is that no cross-sectional dependency exists between the series. If the cross-sectional dependence is found among the variables than the first generation unit root become no longer valid (Alam *et al*., 2016; Paramati *et al*., 2016). After CD test the second generation unit root test, i.e. CIPS given by Pesaran (2007) is used. This test is applied because it gives the most robust result as it performs under the assumption of cross-dependence and heterogeneity in the series.

After the confirmation of the stationary properties, the cointegration among the variables is analyzed. The co-integration was tested by using both the first and second generation co-integration test. The first generation co-integration technique ignores the cross-sectional dependency whereas the second generation co-integration test considers the issue of cross-sectional dependence. In the first generation test Pedroni (1999) & Kao have been used.

The Pedroni is preferred over other co-integration techniques because it solves the biases related to country size and also solves the issue of heterogeneity. It also allows the cross-section interdependence with different individual effects as follows:

$$TER_{i,t} = \alpha_{i,t} + \beta_i^1 REM_{i,t} + \beta_i^2 UNE_{i,t}^2 + \beta_i^3 INF_{i,t} + \beta_i^4 POP_{i,t} + \varepsilon_{i,t}$$

Where i=1…, N is the number of countries and T is the time period.

The co-integration technique analyzed the both, variables and the residuals of a model. The variables are considered to be co-integrated on $I(1)$ and the residuals should be $I(0)$. The residuals can be developed from the equation below:

$$\varepsilon_{it} = \rho_i \varepsilon_{it-1} + \nu_{it}$$

With the null hypothesis of no cointegration, the residual is $I(1)$ and =1. The Pedroni (1999) gives two tests for co-integration within dimension approach and between dimension approach. The within dimension approach consist of four statistics, which are panel vstatistic, panel ρ-statistic, panel PP-statistic. The between dimension approach have three statistics, i.e., Group ρ-statistic, group PP-statistic, and group ADF-statistic. According to Guterrez (2003) group statistics has the best power to judge the co-integration among the test statistics of Pedroni (1999). We also use Kao (1999) residual based panel co-integration test because this test is seen as a simplification of the DF and ADF tests.

In the second generation co-integration test, the technique given by Westerlund (2007) is used. This panel co-integration test is used because the resulting estimates from this framework are robust to a variety of estimation problems that includes endogeneity and omitted variables (Coe et al., 2009; Herzer, 2016). The Westerlund (2007) on the basis of Error Correction Model (ECM) constructed the four statistics related to the panel co-integration i.e., Ga, Gt, Pa, and Pt. The Ga and Pa are calculated on the standard errors given by Newey and West (1994), which adjusted the autocorrelations and heteroskedasticity, while the Gt, Pt are calculated in the standard way, using the standard error parameters of the Error Correction (EC). Moreover, the first difference series data was used because this test needs data to be stationary. All the tests have the null hypothesis of no cointegration with an alternative hypothesis of cointegration.

After the co-integration technique, the association among the variables are estimated. The model fitness is assured by the Wald test and the fixed effect Negative Binomial regression is applied to study the association among the variables. As the terrorism incident data has zero values so this technique is more appropriate. The endogeneity problem of the regressors can also be accounted for using this model. Lastly, the causal relationship between the variables is examined through the heterogeneous panel causality test, developed by Dumitrescu and Hurlin (2012). This test is chosen because the standard panel causality test may give biased result when employed on the coefficients of the lagged dependent variables that are heterogeneous across countries. The Dumitrescu and Hurlin (2012) heterogeneous panel causality test helps to overcome this problem because at first, this test evaluates the Granger causality of the each country examined in the panel, and then average the individual Wald statistics to compute a standardized Granger-causality statistic. These statistics are based on the asymptotic moments of the individual Wald statistics. This test also has good small-sample properties and give reliable results even in the presence of cross-sectional dependence and in order to run this test the variables need to be stationary so the first different variable series are used for the analysis.

Results and Estimations
4.1 Unit Root Analysis:
The unit root test is reported in table 3. The results are reported with the trend and without trend term. The panel unit root test shows that all the variables are integrated at first difference and the

series of variables does not exhibit the unit root problem. This implies that the variables can be used to analyze the long run association.

-Insert Table 3 Here-

In this study, the second order test CIPS developed by Pesaran (2007) has been applied to analyze the stationary property of the variables. This test is preferred over the first-generation test, i.e., Levin, Lin and Chu, Im, Pesaran and Shin, Augmented Dickey-Fuller, because this test gives more accurate result in the presence of cross-dependence and heterogeneity. But before applying the CPIS unit root test, we check whether the variable series have the cross-sectional dependence or not by employing the CD test developed by Pesaran (2004). The result related to the test is reported in table 4.

The result of the CD test shows that the null hypothesis is rejected, which means that the cross-sectional dependence exists in the data. So, we applied the CIPS unit root test given by Pesaran (2007). The result of CIPS shows that all the variables are non-stationary at the level and become stationary at the first difference I (I). In order to employ the second order co-integration, the variables should be non-stationary al levels, so the variables meet the above criteria and can be used to estimate the long-run relationship.

-Insert Table 4 Here-

4.2 Co-integration Analysis:
After the confirmation of the unit root test that the variables are integrated, the panel co-integration technique given by Pedroni (1999) was employed. The outcomes of Pedroni's panel co-integration are displayed in table-5. Results indicate that in the all six models the test statistics of ADF and PP based on both within the dimension and the group based approach statistics demonstrate the rejection of the null hypothesis of no cointegration in the favor of alternative that all variables are considered co-integrated in South Asian countries. Guterrez (2003) argues that group statistics has the best power to judge the co-integration among the test statistics of Pedroni (1999). It is concluded that our selected variables exhibit a valid long run relationship.

-Insert Table 5 Here-

Results of Kao residual based panel co-integration test is presented in table-6. Results suggest that in all six model the null hypothesis of no cointegration is rejected in the favor of alternative that all variables are considered co-integrated in South Asian countries.

-Insert Table 6 Here-

The result related to the second generation co-integration test, i.e., Bootstrap panel co-integration given by Westerlund (2007) is reported in table 7. The result shows the both with and within dimension results. All the variables show that the null hypothesis is rejected with an acceptance of the alternative hypothesis. Thus, it can be concluded that all the variables are co-integrated in the long run.

-Insert Table 7-

4.3 Long Run Estimations:

The result related to Wald test and fixed effect negative binomial regression is presented in table-8. As seen from the table, the Wald test is significant at the 1% level, confirms the model fitness and give assurance that the negative binomial regression is the correct choice. The fixed effect negative binomial model of the complete sample indicates that the workers' remittances have a significant positive impact on the terrorist incidents in South Asian countries. The result is consistent with the studies of Mascarenhas and Sandler (2014); Ullah et.al (2015). The outcome of the result can be concluded that the remittance is among one of the sources that find their way to terrorists and are used by the terrorists in funding different terrorist activities.

-Insert table 8 Here-

The result indicates that unemployment has a positive but insignificant effect on terrorism in South Asian countries. The result is in accordance with the study of Piazza's (2006) who also reported the insignifiacnt association between the variables. The association between the inflation and terrorism is found positive and significant which are in accordance with the studies of Shahbaz (2013); Akhmat et.al (2014). This implies that inflation hike reduces the purchasing power of every individual, so in order to survive and to achieve financial resources for themselves and their families, they choose terrorism as a possible course of action for survival. As a result of this terrorism increases. The population size also has a positive relationship with terrorism, the result is in line with the work of Li & Schaub (2004), Chenoweth (2010) who also reported the same association between the large population and the terrorist event risk. This implies that the countries that comprised of the large population are more likely to produce terrorist groups or terrorist individual that commit terrorist incidents. Mascarenhas and Sandler (2014) reports that large population makes it difficult to eliminate terrorism, however, it acts as a source that provides individual to be recruited by the active terrorist group. Eyerman's (1998) concluded that highly populated countries seem to create issues for the police, and thus, it is convenient for the terrorist group to carry out their operations within them.

4.4 Robustness Check:

In order to check the robustness of the result, the FMOLS technique has been applied. The result related to FMOLS is reported in table 9. The result shows that remittance has a significant positive effect on terrorism incidents. This implies that the increase inflows of remittances upsurge the terrorism incidents and attacks in the south Asian countries. The consistent result is found from FMOLS test which confirms the robustness.

-Insert table 9 Here-

4.5 Heterogeneous Panel causality test:

The short run causality among the variables, i.e., Remittance, population, inflation, unemployment, and terrorism are analyzed by Dumitrescu and Hurlin (2012) test. We used this approach because it allows all the coefficients to be different within the cross sections. To employ this test, all the variables need be stationary so the 1st difference series of the variables are used. The result is reported in table 10. The result shows that unidirectional causality is found between remittance and terrorism, population and terrorism, inflation and terrorism. This implies that

remittance, population, and inflation cause the terrorism, but the terrorism does not affect the said variables. However, bidirectional causality exists between the unemployment and terrorism, which means that unemployment leads to terrorism and terrorism leads unemployment in the South Asian countries.

-Insert table 10 Here-

5. Conclusion & Recommendations:

This study investigates the influence of workers' remittances on terrorist incidents in 5 South Asian countries by using the annual panel data for 20 years from the period of 1994 to 2013. Inflation, unemployment, and population size used as a control variable to analyze their impact on terrorism. The result shows that all the variables are co-integrated and have a significant positive impact on terrorism in South Asian countries except unemployment which has an insignificant effect. It is concluded that remittance may act as a source of funding for the attackers in the South Asian countries. The result gives valuable insights to the policy makers and the government of the regions.

It is recommended that the government should take a keen interest in managing the remittance inflows. They should try to make the remittance transfer procedure more and more transparent. This can be done by restricting the licensed agents or legal entities to send money through formal channels only i.e. authorized banks or authorized money exchange. Moreover, whoever transfers money through illicit means should be administrated and penalized accordingly. The remittance transfer through informal ways is quite prevalent in the South-South remittance corridors (Bracking & Sachikonye 2008; Ratha & Shaw 2007). Moreover, the money laundering activities should also be controlled and minimized.

The population also acts as a source of terrorism, so the stable government policies should be developed regarding the reduction of the internal conflicts of the people living in the region. The stable policies help to reduce the political vacuums formed due to the existence of unstable policies between different communities or groups. As this issue is used as the opportunity to the terrorist activist groups to achieve their goals by using those people who are emotionally weak and ignored. The government should also work on improving the intelligence and security department of the regions. They should have proper knowledge related to the communities who are supporting the terrorist. The strict record keeping related to the emigrant's bio-data should be maintained and regularly followed up. Moreover, the strategies that reduce the inflation in the region should be formulated, because inflation acts as a driver that causes terrorist incidents in the region.

This study has some limitations as well. The sample size is restricted to South Asian countries only so the result cannot be generalized to other countries. Variables used in the studies are limited, so the result may be changed if new variables are added to the model. This gives future directions for the researchers to conduct further studies by taking factors like corruption, political instability, and any interference. The role of formal and informal channels on the remittance inflows in the region should also be investigated in the future studies.

Compliance with Ethical Standards:

References:

Abadie, A., & Gardeazabal, J. (2008). Terrorism and the world economy. *European Economic Review*, *52*(1), 1-27.

Abuza, Z. (2002). Tentacles of Terror: Al Qaeda's Southeast Asian Network.Contemporary Southeast Asia, 427-465.

Akhmat, G., Zaman, K., Shukui, T., & Sajjad, F. (2014). Exploring the root causes of terrorism in South Asia: everybody should be concerned. *Quality & Quantity*, 48(6), 3065-3079.

Al-Assaf, G., & Al-Malki, A. M. (2014), Modelling the Macroeconomic Determinants of Workers' Remittances: The Case of Jordan. *International Journal of Economics and Financial Issues, 4*(3), 514-526.

Ali, G., & Li, Z. (2016). Role of economic factors in terrorism in Pakistan. Quality & Quantity, 50(5), 2237-2250.

Benmelech, E., Berrebi, C., & Klor, E. F. (2012). Economic conditions and the quality of suicide terrorism. The Journal of Politics, 74(1), 113-128.

Bracking, S., & Sachikonye, L. (2008). Remittances, Poverty Reduction and Informalisation in Zimbabwe 2005-6: a political economy of dispossession?. *Brooks World Poverty Institute Working Paper*, (28).

Brown, S. S. (2006). Can Remittances Spur Development? A Critical Survey1. *International Studies Review*, *8*(1), 55-76.

Caruso, R. (Ed.). (2014), Understanding terrorism: A socio-economic perspective (Vol. 22), Emerald Group Publishing

Caruso, R., & Schneider, F. (2011), The socio-economic determinants of terrorism and political violence in Western Europe (1994–2007). *European Journal of Political Economy*, *27*, S37-S49.

Chenoweth, E. (2010). Democratic Pieces: Democratization and the Origins of Terrorism in *Coping With Terrorism: Origins, Escalation, Counterstrategies, and Responses*. State University of New York Press; New York.

Coe, D. T., Helpman, E., & Hoffmaister, A. W. (2009). International R&D spillovers and institutions. *European Economic Review*, *53*(7), 723-741.

Eckstein, Z., & Tsiddon, D. (2004). Macroeconomic consequences of terror: theory and the case of Israel. Journal of Monetary Economics, 51(5), 971-1002.

Elu, J. U., & Price, G. N. (2011), Do remittances finance terrorism in Sub-Saharan Africa "*Unpublished manuscript. Atlanta", GA: Department of Economics, Morehouse College*.

Enders, W., & Sandler, T. (1995). Terrorism: Theory and applications. Handbook of defense economics, 1, 213-249.

Eyerman, J. (1998). Terrorism and democratic states: Soft targets or accessible systems. *International Interactions*, *24*(2), 151-170.

Freytag, A., Krüger, J. J., Meierrieks, D., & Schneider, F. (2011). The origins of terrorism: Cross-country estimates of socio-economic determinants of terrorism. *European Journal of Political Economy*, *27*, S5-S16.

Funkhouser, E. (1995). Remittances from international migration: A comparison of El Salvador and Nicaragua. The review of economics and statistics, 137-146.

Gaibulloev, K, & Sandler, T. (2009), The impact of terrorism and conflicts on growth in Asia. *Economics & Politics*, *21*(3), 359-383.

Herzer, D. (2016). Unions and Income Inequality: A Heterogeneous Panel Co-integration and Causality Analysis. *LABOUR*, *30*(3), 318-346.

Ismail, A. & Amjad, S, (2014), Determinants of terrorism in Pakistan: An empirical investigation. *Economic Modeling*, *37*, 320-331.

Keynes, J M (1919) The Economic Consequence of the Peace. Macmillan, London UK

Krondtadt, K. A., & Vaughn, B. (2004, December), Terrorism in South Asia. *Library of Congress Washington Dc Congressional Research Service.*

Li, Q., & Schaub, D. (2004). Economic globalization and transnational terrorism a pooled time-series analysis. *Journal of Conflict Resolution*, *48*(2), 230-258.

Lucas, R. E., & Stark, O. (1985). Motivations to remit: Evidence from Botswana. *The Journal of Political Economy*, 901-918.

Malik, Z., & Zaman, K. (2013). Macroeconomic consequences of terrorism in Pakistan. *Journal of Policy Modeling*, 35(6), 1103-1123.

Mascarenhas, R., & Sandler, T. (2014), Remittances and terrorism: A global analysis. *Defense and Peace Economics, 25*(4), 331-347.

Mehmood, S. (2014), Terrorism and the macro-economy: Evidence from Pakistan. *Defense and Peace Economics*, *25*(5), 509-534.

Mughal, M. Y., & Anwar, A. I. (2015). Do migrant remittances react to bouts of terrorism?. *Defence and Peace Economics*, *26*(6), 567-582.

Okafor, G., & Piesse, J. (2017). Empirical Investigation into the Determinants of Terrorism: Evidence from Fragile States. Defence and Peace Economics, 1-15.

Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. Journal of Applied Econometrics, 22(2), 265-312.

Piazza, J. A. (2006). Rooted in poverty?: Terrorism, poor economic development, and social cleavages 1. *Terrorism and Political Violence*, *18*(1), 159-177.

Rahman, Z. U. (2014), Worker's Remittances and Economic Development in Pakistan a Time Series Analysis (1980-2010). *Journal of Economics and Sustainable Development*, *5*(22), 51-54.

Ratha, D., & Shaw, W. (2007). *South-South migration and remittances* (No. 102). World Bank Publications.

Richardson, C. (2011). Relative deprivation theory in terrorism: A study of higher education and unemployment as predictors of terrorism. Politics Department, New York University.

Robbins, L. (1942) The Economic Consequences of War. Jonathan Cape London, UK

Russell, S.S. (1992). Migrant Remittances and Development. *International Migration,* 30(3-4), 267-287.

Sander, C., & Maimbo, S. M. (2005). Migrant remittances in Africa: A regional perspective. *Remittances: Development impact and future prospects*, 53-79.

Santifort-Jordan, C., & Sandler, T. (2014). An empirical study of suicide terrorism: A global analysis. Southern Economic Journal, 80(4), 981-1001.

Shahbaz, M. (2013). Linkages between inflation, economic growth and terrorism in Pakistan. Economic Modelling, 32, 496-506.

Shahbaz, M., & Shabbir, S. M. (2011). Is hike in inflation responsible for rise in terrorism in Pakistan?.

Taylor, E. J. (1999). The new economics of labour migration and the role of remittances in the migration process. *International migration*, *37*(1), 63-88.

Taylor, J. E. (2004). Remittances, Savings, and Development in Migrant-Sending Areas. *International Migration: Prospects and Policies in the Global Market.* Oxford: Oxford University Press.

Table-1: Variable Definitions

Variable	Full Form	Definitions
TER	Total Domestic Terrorist Incidents	A terrorist attack is the threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation.
REM	Personal remittances received	Personal remittances comprise personal transfers and compensation of employees. Personal transfers consist of all current transfers in cash or in kind made or received by resident households to or from nonresident households.
UNE	unemployment	Unemployment refers to the share of the labor force that is without work but available for and seeking employment.
INF	Inflation as GDP deflator (annual %)	Inflation, as measured by the annual growth rate of the GDP implicit deflator, shows the rate of price change in the economy as a whole.
POP	Population Size	It counts all residents regardless of legal status or citizenship--except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin.

Note: Terrorist Incidents definition is taken from GTD database whereas, remaining variables definition are taken from the source of World bank.
Source: Authors' construction.

Table 2: Descriptive Statistics

	TER	REM	POP	INF	UNE
Mean	176.8	0.06	287.0	8.1	4.8
Median	63.0	0.05	133.0	7.3	4.3
Maximum	2213.0	0.29	1252.1	24.9	13.0
Minimum	0.0	0.01	17.9	2.5	1.8
Std. Dev.	326.2	0.06	414.3	4.2	2.2
Observations	100	100	100	100	100

Source: Authors' estimation.

Table-3: Results of Stationary Analyses

| Variables | Im, Pesaran, and Shin | | | |
| | I(0) | | I(1) | |
	C	C&T	C	C&T
TER	-0.202	-1.616*	-4.391***	-3.961***
REM	1.993	-1.062	-3.896***	-2.189***
POP	1.137	-14.137***	-6.110***	-7.688***
INF	-2.737***	-1.388*	-7.111***	-6613***
UNE	-1.091	-1.4006*	-5.285***	-4.267***

***, **, * indicates significance level respectively at 1%, 5% and 10%.

Source: Authors' estimation.

Table-4: Results of Cross-Sectional Dependence and CIPS Unit Root Test

| Variable | CD test | p-value | CIPS test | |
			Level	1st difference
TER	5.836	0.000	-2.009	-4.289***
REM	11.756	0.000	-1.228	-4.338***
POP	13.941	0.000	1.831	-3.852***
INF	2.877	0.004	-1.420	-5.149***
UNE	12.227	0.000	-1.338	-4.221***

Note: ***, **, * indicates statistical significance at 1%, 5% & 10%.
Source: Authors' estimation.

Table-5: Results of Pedroni ((Engle-Granger based) Panel Cointegration

Estimates	Stats.	Prob.
TER = f (REM+UNE+INF+POP)		
Panel v-statistic	-0.7820	0.7829
Panel rho-statistic	-0.3185	0.3750
Panel PP statistic	-3.4693	0.0003
Panel ADF statistic	-1.8542	0.0319
Alternative Hypothesis: Individual AR Coefficient		
Group rho-statistic	1.4120	0.9210
Group PP statistic	-1.3787	0.0840
Group ADF statistic	-2.0691	0.0193

The null hypothesis of Pedroni's (1997) panel cointegration procedure is no cointegration
Source: Authors' estimation.

Table-6: Results of Kao Residual (Engle-Granger based) Panel Cointegration

Estimates	Stats.	Prob.
TERR = *f* (REM+UNE+INF+POP)		
Panel ADF statistic	-2.729809	0.0032
Residual variance	0.379658	
HAC variance	0.192317	

The null hypothesis of Kao Residual Cointegration panel cointegration procedure is no cointegration.
Source: Authors' estimation.

Table 7: Results of Westerlund (2007) Bootstrap Panel Cointegration

Statistic	Value	Z value	*p*-value
Deterministic chosen: constant			
Gt	-4.259	-4.257	0.000
Ga	-3.221	-5.085	0.000
Pt	-5.222	-4.338	0.000
Pa	-3.758	-5.214	0.000
Deterministic chosen: constant and trend			
Gt	-2.058	-4.039	0.000
Ga	-2.812	-3.995	0.000
Pt	-4.002	-4.026	0.000
Pa	-3.251	-4.118	0.000

Note: The null hypothesis of Pedroni's (1997) panel cointegration procedure is no cointegration.
Using the bootstrap approach of Westerlund (2007) to account for cross-sectional dependence, the number of replications is 400.
Source: Authors' estimation.

Table-8: Results of Fixed Effect negative binomial regression of Terrorism on South Asian Countries

Variables	Coeff.	Prob.
C	-0.616	0.077
REM	0.021	0.000
UNE	0.020	0.713
POP	0.002	0.000
INF	0.039	0.022
Wald $\chi 2$	127.62	0.0000

Note: statistical significance level 10%
Source: Authors' estimation.

Table-9: Results of Long Run Analysis through FMOLS

Variable	FMOLS		
	Coeff.	t-stats.	Prob.
REM	0.032	3.966	0.000
UNE	0.195	2.212	0.031
POP	0.004	1.923	0.058
INF	0.068	2.997	0.004
Adj. R^2		0.493	

Note: statistical significance level 10%
Source: Authors' estimation.

Table-10: Results of Heterogeneous Panel Causality Test

Null Hypothesis	Stats.	Prob.
TER does not homogenously cause REM	0.589	0.556
REM does not homogenously cause TER	4.749	0.000
TER does not homogenously cause UNE	2.559	0.011
UNE does not homogenously cause TER	3.633	0.000
TER does not homogenously cause POP	1.174	0.240
POP does not homogenously cause TER	6.354	0.000
TER does not homogenously cause INF	0.483	0.629
INF does not homogenously cause TER	2.342	0.019

Note: statistical significance level 10%.
Source: Authors' estimation.