How Terrorism Affect Economic Growth in Pakistan: By Using Co-Integration Approach

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Abstract
The aim of this study is to explore the long-term relationship between economic growth and terrorism. Johansen Co-integration analysis is used to gauge the effect of terrorism on economic growth. Annual time series data used from the period 1981-2015. Data of terrorism is obtained from GTD (Global Terrorism Database) while the data of economic growth is obtained from WDI World Bank Indicator. The analysis suggests the finding that there is a long-term relationship among the key macroeconomic indicators and terrorism. The present paper fills the gap by using the literature and econometric sophisticated techniques that delivered proof for the relationship among many macroeconomic indicators and terrorism.
Keywords: Co-integration, Economic Growth, Terrorism
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1. Introduction

According to Sandler and Enders (2008) terrorism is deliberate use or threat of use of viciousness by a person or group of person to achieve some political or social advantages by threating of a large group of people, not only immediately affected people. But also 9/11 terrorist attack in 2001, terrorism has obtained more significance, however it is not a new phenomenon. The war on terror which started subsequent to the 9/11 attacks has affected the entire globe, especially the middle east and south Asian regions. According to the US and its allies, Al-Qeada's terrorism activities were being supported by Afghanistan's Taliaban Govt. In 2001, after the occurrence of 9/11 attacks, the US and NATO attacked Afghanistan. As a result of war on terror, Pakistan being a bordering country of Afghanistan was also impacted. The consequence of terrorism has not only affected Pakistan's social fabric, but it is also significant to developing economies like country Pakistan. Terrorism severely affects a developing country more than a developed country, as developed countries have varied economies and terrorism results only in reallocation of resources to more stable industries of an economy. Though in the case of developing countries the absorption of resources in many segments are effected (Sandler and Enders 2008). Due to the participation in Afghanistan's war, Pakistan has been affected by terrorism for three decades, also due to the participation in Afghanistan's war there are many other factors such as ethnic religious groups and nationalist patriotic activity conflicts which are sources of terrorism in Pakistan. Such condition results in eventually reducing the economic growth of Pakistan. In addition, the current study adds to the current literature by providing indication on the effects of terrorism on economic growth of Pakistan. Data has been used to analyze the impact of terrorism on economic growth of Pakistan from 1981-2015. The economy of Pakistan's under duress due to terrorism. The Pakistan's economic growth has stalled in this years because of domestic issues outside of the financial global crises. The interior problems involving the war on terror was started by the Khyber Pakhtunkhwa (KPK) security forces in the Tribal Areas Federally Administrated (FATA) attached with Afghanistan. Later in 2006, the war in Pakistan was prolonged like an infection of Pakistan's traditional areas caused damage not only to valuable human life, but similarly accounted for huge interruptions in economic growth. According to Schwab and Sala-i-Martin (2010) Pakistan's (2010-2011) economic survey it states that due to the war in Pakistan destruction of infrastructure and the death of 3500 security personal, accounts for the main displacement of native people from their home towns is about three million people, and led to a decrease in investment activity , in addition to a decline in production and subsequent unemployment. Equally the displaced interior rehabilitation of people (IDPs) and the war on terror spent a large share of government financial resources, therefore expanding the financial shortfall and obstructing economic growth. Pakistan had not ever felt such as economic confusion and social upsetting in its industry, although the country suffered by direct war. Pakistan obstinately tolerated a huge cost in since of together and the economic condition security. A heavy portion of its capital, manpower and materials are being keen to this war the past few years. According to the 2010-2011 economic survey, the economy was exposed to huge direct and indirect costs which increased from $13.6 billion by 2009-2010 to $17.8 billion in the fiscal year (2010-2011) and was expected to increase even more in 2011-2012. Throughout the previous ten years the indirect and direct costs of war on terror suffered by Pakistan summated to $67.93billion or Rs.5037 billion. Concisely, terrorism inversely effects the growth and accounts for a huge economic impact on the economy. Besides that, effective acts to fight terrorism may produce important assistance for the economy, avoiding losses from the decrease of trade flow and speculation

that challenge economic growth in the long term. Pakistan needs huge increases in finances to maximize the effective abilities of the economy. Increasing the security situation will be the main factor of the upcoming development of financial activities.

This study composed of five main section. First section is introduction of the study. The second section will provide an adequate literature about the terrorism and economic growth. Section 3 & 4 will explain the research methodology and important finding the last section will provide some concluding remarks and policy implication.

2. Literature

There is very inadequate literature on the effects of terrorism on economic growth of a country. Though some brief literature is provided below. Terrorism economic model presented by (Blomberg, Hess et al. 2002) in which extremist group which are uneasy about the current condition in a certain country effort to initiate change through various types of terrorist activities. The different terrorist activities resulted depends on the economic situation of a country which is affected by terrorist groups. Either the increasing of terrorism which can decrease economic activities, or for example if more economic motivation exists in an economy then extremism is reduced, terrorist activities which are reduced through a higher employment rate can be used to discourage terrorist activities In the light of this study the probability of decline in high revenue countries is greater of terrorist activities. (Blomberg, Hess et al. 2004) investigated the effect of terrorism from the period of 1968 on 177 countries. The investigation finds a negative relationship on the effect of terrorism on economic development. Besides results show the extremist results in unstable capital from speculation expenditure through government expenditure. Although the frequency of terrorism is different in various groups of countries. For example, the effects of terrorism are more significant on developing countries as compared to OECD countries though the extremist acts are much common in developed economies but their effect was less.

According to Sandler and Enders (2008) effects of terrorism on developing and developed countries are similar in their views. The study claims that developed countries with massive economies and the result of any terrorist activity simply helps move the resources amongst several segments of the economy. Though in the case of developing countries any large terrorist activities may create risk for economic growth. Similarly, their economies are vast, the developed countries have power to absorb the terrorism effect and have best institutions and markets. Developed countries can provide the essential monetary and financial incentives to absorb the impact of terrorism, though several developing countries lack this capability. Therefore, terrorism has induced some economic shock effect to the economic growth in other countries.

(Koh 2007) investigated the effect of terrorism and war on the global economy, research and development and the allocation of resources. Terrorism brings many types of costs to an economy in which one of them is the crowding out the expenditure of private R&D to expenditure in military R&D to counter terrorism. Which consequently diminishing the economic growth. Moreover, when international corporations intend to invest with in a new country, they analyze the country's risk and pay a larger premium for security. This is a kind of impediment to the investment flow into emerging countries and it also raises operational costs. Due to the rise in counter terrorism spending on security private R&D spending has decreased. The exodus of private R&D spending to security R&D would decrease the level of invention over time. Thus, economic growth decreases in the long run.

Gaibulloev and Sandler (2009) analyzed terrorism's effect on per capita grow for the period from 1970-2004 in Asia. The study investigated the importance of the growth controlling and the effect of terrorism. The effect looks to be stronger in the case of developing countries as compared to developed countries. As the developed countries have the flexibility of terrorism due to their healthy economies. Terrorist activities generated by domestic conflicts resulted in twice the effect of decreasing growth as matched to those of international conflicts. The key growth diminishing effect arises from the increase in government spending and the increasing of terrorist activities the investment will be decrease. Terrorism not only affects those country in which the terrorist activities occur, but neighboring countries are also affected.

According to Murdoch and Sandler (2004) examined the effect on neighboring countries during a civil war. The study investigated the decrease in growth not only in the effected country but it also impacts neighboring countries. Terrorism's growth has a limiting effect on effected economy in the short term and the long term but also effected neighboring economies. In the short term, civil war can decrease the economic development by as much as 85% in the effected economy however 30% effect for long term. Though in the case of neighboring country effect of decreasing growth 24% for short term and for long term 30% happened.

According to Gries, Krieger et al. (2011) the causality among economic growth and terrorism from 1950 to 2004 for seven western countries. Which can go to maximize the conflicts and terrorism. Low economic growth causes terrorism because terrorism negatively affected to accrual and distribution of resources. The result also shows that terrorism pattern and economic growth is deeply influenced by significant political or economic events. Additionally, in some countries terrorism is statically caused due to economic growth, though the

economies of those countries are strong enough to resist these kinds of terrorism attacks.

Terrorism, Sectarianism, Ethnic Conflicts in Pakistan

Afghan War

Due to terrorism in the last three decades Pakistan has been in a worsening condition. By its strategic geographic position and terrorist activities, Pakistan has been an epicenter of terrorism. In 1979 the USSR attacked Afghanistan, since Pakistan, shares a border with Afghanistan it is affected by any attack in Afghanistan. Afghanistan started its defense with old weapons. Pakistan perceived that after attacking Afghanistan the USSR would attack Pakistan, due to this reason Pakistan stood with Afghanistan to defeat the USSR. After the USSR invasion, America and her allies joined the battle ground in Afghanistan to defeat the USSR. Primary logistic channels were provided to Afghanistan by Pakistan. Afghanistan had no capability to defeat the USSR on its own and were aided with US and Pakistan supported military and economically supported by Arab countries.

Pakistan was also affected by the civil war in Afghanistan. Numerous unstable governments were installed in Afghanistan, Afghanistan faced a worsening political climate during the war. It was in this period that Afghans became upset with the civil war and wanted a strong government to control the law and order situation in Afghanistan.

The strong government came in the form of the Taliban, whose students studied in Madrassas (religious school) in Afghanistan and Pakistan. The law and order and strong government became much more stabilized by the Taliban. But the Taliban government was formally only accepted by Saudi Arabia, UAE and Pakistan. The global community isolated them form ordinary due to their non-acceptance. In search of good base for spreading their idea of radical Islam, the earlier Arab Mujahedeen also on the back proof with the new Arab, Central Asian Islamist and African Mujahedeen.

Al-Qaeda was founded by one American man named, Osama bin Laden. Al-Qaeda was suspected for the 9/11 attack by US and in revenge the US attacked Afghanistan, and defeated the Taliban's government. Afghanistan became angry due to the fact that a foreign country attacked their homeland, therefore another freedom war had begun. The previous Mujahedeen organizations were also united by the Taliban. The US pressure on the former Pakistani president Musharraf led the government of Pakistan to take U turn with their former friend by closing its ties. Pakistan allowed the US military to supply their troops in Afghanistan.

Ethnic Conflict

The capital city of Sindh province in Pakistan was also in the hold of ethnic conflict in during the eighties. Numerous groups were involved in ethnic conflicts in Karachi at the time. For economic activities Karachi is the main economic center of Pakistan. Owing to the bountiful opportunities in business and services, people are attracted from all over Pakistan to live in Karachi. Besides the siddhis native people other people came to Karachi from Pakistanis three provinces. Over that period, the ethnic isolation started and this isolation caused ethnic conflicts. In the mid-eighties these conflicts were began and in 1990's reached a climax. The military operation started in the 1990's by the People Party and Muslim League government of Pakistan. The operation was partly successful. In first part of the twenty-fist century, although ethnic conflicts stopped, disturbances sustained in the shape of improved the criminal events. Extortion is the most prominent in these criminal activities, especially for businessman. Though for the criminal activities against the new operation started, which became evident from the fecund lawbreaking in Karachi.

Sectarian Conflict

In the 1980's Pakistan was inundated by sectional conflict. Islam's two main sects were involved in a sectarian conflict in Pakistan. The Zia Ul Haq's In the eighties, administration tried to implement Islam in Pakistan. Though later there were some religious problem among the two sects, within the Zia government Islam was not acceptable by the two sects. In the 1980's in during the Afghan war, the flow of funds started from Middle Eastern countries to religious groups to fight in Afghanistan against the Soviet Union. Chandran (2003) argues that these funds were enough for religious groups to support their militant groups, so sectarian conflicts occurred. A trend of terrorism founded on sectarian differences caucused the death and injuring of both groups leaders, and also causes security damage to private citizens and property. Further the ethnic and religious conflict Baloch nationalism came in the shape another factor. Baluchistan was decided a part of Pakistan in 1951 before which was the independent state. Though the Baloch felt after some time that the central government were exploiting their resources, although those resources the government was not given their due share. Baluchistan is rich in gas and oil, and the main reserve natural gas in Pakistan.

Hypothesis

H1: There is significant negative relationship between economic growth and Terrorism.

H2: There is significant positive relationship between economic growth and foreign direct Investment.

H3: There is significant negative relationship between economic growth and Gross Capital formation.

H4: There is significant negative relationship between economic growth and Gross Savings.

H5: There is significant negative relationship between economic growth and Unemployment.

H6: There is significant Positive relationship between economic growth and Bank credit to private sector.

3. Data and Methodology

In this study annual time series data from the period 1981- 2015 is used. We used many sources for data for economic growth indicator such as we took the data from WDI World Bank Indicator and the terrorism data took from GTD Global Terrorism Database. To find the long-term relationship between terrorism and macroeconomic indicators, we employed Co-integration methodology. The main aim of this study to find the long-term relationship between the macroeconomic Indicators and terrorism.

Table 1: Variables and Data Description

Items	Description
Dependent variables	Economic Growth
Independent variables	GDP, FDI, GCF, GS, UEM, BCP, TIND, (IN, Death)
Data	Time Series Data
Model	Johansen Co-integration Model

This liner regression and co-Integration model employed for below analysis.

$$LNGDP = \beta 0 + \beta 1 LNFDI + \beta 2 LNGCF + \beta 3 LNGS + \beta 4 LNUEM + \beta 5 LNBCP + \beta 6 LNIN + \beta 7 LNTIND + \varepsilon$$

Where LN denotes to natural log and applied for the stationarity of data. GDP is gross domestic product, GCF: Gross capital formation, GS: Gross Saving, UEM: Unemployment, BCP: Bank credit to private sector, TIND: Terrorism index, FA: Fatalities, IN: Injuries, EV: Events whereas βi are the unknown parameters and ε is the error term.

4. EMPERICAL RESULT

4.1 Stationarity:

Table 2 shows the unit root results which are used for finding the stationarity in data for the purpose to avoid spurious regressions (Engle and Granger, 1987). Two tests are use here, the Augmented Dickey Fuller (ADF) test and the non-parametric Phillips-Perron test (pp) unit root test. According ADF test the data is non-stationery at level while stationery at first difference. Further the result was confirmed by Phillips-Perron test.

Table 2: Unit Root Test:

	ADF Test		PP Test	
Variables	At Level	At First Difference	At Level	At First Difference
LNGDP	1.150538	-5.39207	1.325201	-5.39207
LNFDI	-1.33324	-4.72301	-1.38781	-4.65433
LNGCF	0.318828	-5.14072	0.318828	-5.14072
LNGS	0.736813	-6.19843	1.713867	-6.20272
LNUEM	-1.79781	-5.1668	-1.69697	-7.47898
LNBCPS	-0.2462	-4.06318	-0.80496	-4.06318
LNTIND	-2.33419	-5.07315	-1.67412	-5.636
At Critical Level				
1 % Level	-3.63941	-3.64634	-3.63941	-3.64634
5 % Level	-2.95113	-2.95402	-2.95113	-2.95402
10 % Level	-2.6143	-2.61582	-2.6143	-2.61582

4.2 Co-integration Analysis:

From the stationarity test it is clear that the variables are stationary at order one, 1(1), further it is essential to find the non-spurious relationship (co-integrated) relationship among the Regressor. For finding non-spurious relationship among the variables Johanson and Juselius (1990) test is used in this study. The number of lag in this study is 3.

The two tests, Trace statistics test and maximum Eigen value test are used to confirm the existence of long run relationship among the variables. In this study, table 3 reveals that there exist two co-integration equations, which is confirmed by the maximum Eigen value shown in table 4.

Table 3: Trace Statistics:

No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value	Prob.**
None *	0.894769	172.754	125.6154	0
At most 1 *	0.725119	98.45118	95.75366	0.0322
At most 2	0.490412	55.83442	69.81889	0.3847
At most 3	0.395814	33.58738	47.85613	0.5245
At most 4	0.254357	16.95957	29.79707	0.643
At most 5	0.197265	7.273775	15.49471	0.546
At most 6	0.000686	0.022662	3.841466	0.8803

Trace test indicates 2 co-integrating eqn(s) at the 0.05 level

 * denotes rejection of the hypothesis at the 0.05 level

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

Table 4:Maximum Eigen Value Statistics:

No. of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value	Prob.**
None *	0.894769	74.30281	46.23142	0.0000
At most 1 *	0.725119	42.61676	40.07757	0.0253
At most 2	0.490412	22.24704	33.87687	0.5885
At most 3	0.395814	16.62782	27.58434	0.6120
At most 4	0.254357	9.685791	21.13162	0.7736
At most 5	0.197265	7.251113	14.2646	0.4599
At most 6	0.000686	0.022662	3.841466	0.8803

Max-Eigen value test indicates 2 co-integrating eqn (s) at the 0.05 level

 * denotes rejection of the hypothesis at the 0.05 level

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

 Table 5 posit the results of co- Integration equation. The result reveals the long term positive linkages between foreign direct investment and economic growth. The coefficient of the FDI is 1.3748 and positive with economic growth, indicating that one-unit increase in FDI will enhance economic growth by 1.3748. The result is in the line with the study of (Amuwo 2014) . Further the result reveals that gross capital formation (GCF), Unemployment (UEM) and gross capital formation (GCF) are negatively linked with the economic growth (GDP). Gross saving (GS) has no dynamic long-term linkage with economic growth. Terrorism index which is the main focus of this study has negative and significant relationship with economic growth. One unit increases in terrorist events decrease the economic growth by 0.3912. The result is in the line with study of (Ullah and Rahman 2014).

Table 5: Normalized co-integrating Equation

LNGDP	LNFDI	LNGCF	LNGS	LNUEM	LNBCPS	TIND
1	1.374869	-3.192378	0.139489	-0.963192	-4.929894	-0.391927
SE	(0.13444)	(0.67097)	(0.45127)	(0.1474)	(0.40515)	(0.04048)

4.3 Short run Error Correction Model:

It is confirmed that there exist long run dynamic relationship among the concern variables, it is further investigated to find short run association among the variables by estimating error correction (EC) model (Engle and Granger, 1987). The variation in these variables posit short run linkage, while the coefficient on the error correction term (ECT) shows the speed of adjustment back to the long run relationship among the variables. The estimation is reported in table 6.

Table 6: Error Correction Model

Error Correction:	CointEq1	Standard Error	T-Value
D(RGDP)	-0.04168	-0.01873	[-2.22567]
D(RFDI)	-0.38293	-0.15261	[-2.50920]
D(RGCF)	-0.05512	-0.02846	[-1.93706]
D(RGS)	-0.00385	-0.03005	[-0.12800]
D(RUEM)	2.556241	-1.19162	[2.14518]
D(RBCPS)	-0.175	-0.19769	[-0.88522]
D(RTIND)	5.173341	-3.67797	[1.40657]

4.4 Variance Decomposition:

Given there is a stable long run and short run relationship among the relevant variables, it is also essential to find the contribution of the variables in the changes in the dependent variables. Focus on this, variance decomposition

test is used. The result is shown in table 7. The result reveals that 68.53% variation in economic growth is caused by its own variation. Among the independent variables the greater changes are brought by BCPS (bank credit to private sector) which is approximately 13%. 4.3995% changes in economic growth are caused by terrorism index.

Table 7: Variance Decomposition:

Period	S.E.	RGDP	RFDI	RGCF	RGS	RUEM	RBCPS	RTIND
1	0.0012	100	0	0	0	0	0	0
2	0.0016	**68.535**	**2.9092**	**4.5447**	**2.3528**	**4.2604**	**12.999**	**4.3995**
3	0.0018	65.814	2.7385	3.9008	5.1354	7.8245	10.639	3.9476
4	0.002	65.508	2.2376	4.5438	4.1447	7.0983	12.289	4.1781
5	0.0023	65.325	5.2074	3.82	4.1341	6.2638	11.435	3.8144
6	0.0026	61.069	4.2129	3.1418	4.7637	6.6026	15.623	4.5873
7	0.0028	60.12	3.819	3.0051	5.2705	7.4194	15.625	4.7417
8	0.0029	60.579	4.605	2.9396	4.8337	6.9332	15.548	4.5618
9	0.0032	59.928	4.2971	2.541	5.0639	6.7904	16.643	4.7372
10	0.0034	59.369	3.9779	2.3325	5.2926	7.0758	17.032	4.9204

Hypothesis testing

The hypothesis testing result are shown in Table 8. The result expose that the key hypothesis for altogether are accepted that is there are a conformation of long run relationship among economic growth macroeconomic indicators and terrorism.

Table 8: Hypotheses testing

Variables	Hypothesis	Decision
Economic growth and Terrorism	H1: There is significant negative relationship between Economic growth and terrorism.	Rejected
Economic growth and FDI foreign direct Investment.	H2: There is significant Positive relationship between Economic growth and	Accepted
Economic growth and GCF Gross Capital formation	H3: There is significant Positive relationship between Economic growth and	Accepted
Economic growth and GS Gross Saving.	H4: There is significant negative relationship economic growth and between	Rejected
Economic growth and Unemployment. Unemployment	H5: There is significant negative relationship between economic growth and	Accepted
Economic growth and BCPS Bank credit to private sector.	H6: There is positive significant relationship between economic growth &	Accepted

5. Conclusion

The aim of this investigation is to find empirically the landscape, intensity and relationship between terrorism and economic growth in Pakistan, while the annual time series data has been taken from 1981-2015. The findings discover the influencing orders between diverse macroeconomic indicators such as Gross domestic product (GDP) proxy for economic growth, Foreign direct Investment (FDI), Gross capital formation (GCF), Gross saving (GS), Unemployment (UNEM), Bank credit to Private sector (BCPS) and terrorism index. The aim has been attained by means of the sophisticated techniques of econometrics as well as Granger causality test and co-integration methodology. The result expose that the long-term relationship among macroeconomic indicators and terrorism occurs.

FDI has positive long-term association with economic growth similarly Gross Capital Formation. Further the result reveals that gross capital formation (GCF), Unemployment (UEM) and gross capital formation (GCF) are negatively linked with the economic growth (GDP). Gross saving (GS) has no dynamic long-term linkage with economic growth. Terrorism index which is the main focus of this study has negative and significant relationship with economic growth. The result is in the line with study of (Ullah and Rahman 2014) .

Policy implications

Terrorism is the dominant problem for Pakistan. Findings of this investigation shows that in maximum cases the increase of terrorism due to the socio- economic condition is a real factor of a country. Thus, the main stage to inductee and strategy in order to decrease terrorism is to increase the economic situation and social in the country. In Pakistan the most significant factor is unemployment which is the cause of instability of economic growth of Pakistan it should be let down to put on the way of the growth of economic. The regime should immediately start project for development and using their resource in the affected area. As a finding, the people

would not have protected employment opportunities only but also would contribute in the country development. In this method the economic immorality impassive can by the people.

On the correlation among the GDP and Terrorism effort to increase the economic growth with strength important policy to calculate disappoint in Pakistan terrorism by dropping the depression of the poor people. Besides to increase the chance of development in the terms of development the facilities of education, suitable employ chances and well improvement probabilities should be providing. For this finding there must be agreement at state level among all the administrative, religious and political and the leadership of army on one point agenda that is opposite extremism and terrorism, there must be interior constancy in the country, the country political constancy, good governance, chance of contribution, justice and liberty of speech to people.

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