



Terrorism and its Determinants: Panel Data Evidence from 94 Countries

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Abstract

In recent years, the world is plagued by terrorism which has slowed down economic growth and development across countries. This paper focuses on the terrorism affected countries to determine what actually causes terrorism. The paper utilized a comprehensive sample of 94 countries from 2005 to 2016 and employed suitable econometric techniques to estimate the specified models. The results revealed that low per capita income and political instability are the main driving forces behind prevalent terrorism. Similarly, the growths of both physical as well as human capital have reduced terrorism whilst inflation and government consumption have positively influenced terrorism. The role of military expenditures is observed to be dual as it impacted terrorism negatively in Muslim countries and positively in non-Muslim countries. Decreased corruption is found to be insignificant for the sample as whole but appeared to be having a negative impact on terrorism when the sample is divided between Muslim and non-Muslim countries. The robustness exercise has also revealed similar findings. Lastly, we found bidirectional causality between political instability and terrorism, political instability and corruption, government consumption and inflation and the growth of GDP per capita and the growth of physical capital stock. The paper suggests that countries where terrorism is on the rise shall focus on increasing income of the population, education, capital stock along with ensuring political stability to eradicate the problem of terrorism.

Keywords Terrorism · Political instability · Military expenditures · Income · Corruption

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Introduction

The world is facing a crucial problem of terrorism which is indeed responsible for slow economic growth and development of countries. The Global Terrorism Index (hereafter, GTI) defines terrorism as “The threatened or actual use of illegal force and violence by a non-state actor to attain political, economic, religious, or social goals through fear, coercion, or intimidation”. Terrorism has multiple consequences as it destroys both human as well as physical capital. The GTI report (2016) highlighted that “per capita income of Israel would have been 10 per cent higher if the country had limited terrorism in the three years up to 2004”. Blomberg et al. (2004) argued that terrorism negatively impacts economic growth and further reshuffle economic activities toward government spending from investment spending. Terrorism levies economic costs such as high expenditure on security, human capital loss and loss of infrastructure and low investment opportunities in respective nations. Saha and Yap (2014) documented that terrorism along with political instability adversely influence the tourism industry of countries. According to GTI (2017) report, the world faced a cost of USD 14.3 trillion which is equal to 12.6% of world’s GDP in 2016. Similarly, the GTI report (2014) report pays attention to the economic costs incurred due to terror activities which includes short term and long term effects, resulting in an increase in cost of insurance and government spending.

Terrorism results in both primary and secondary effects. Primary effects of terrorism include loss of human’s lives (fatalities) or instant injuries caused by terror activities. Alcalá et al. (Alcalá et al. 2017) showed that 29,376 people have lost their lives in 2015 because of terrorism. Secondary effects are long term by nature which includes low FDI and trade flows, less tourism and stock market fluctuations, security risks and financial loss, respectively. For example, Spain had faced 10% decline in economic growth due to terrorism in late 1960’s owing to Basque country incident. According to Cinar (2017), terrorism results in low economic growth especially in low income economies than high income economies. Similarly, Meierrieks and Gries (2013) revealed that terrorism is responsible for poor economic growth in Islamic and African economies. Abadie and Gardeazabal (2008) illustrated that the allocation of capital is affected by terrorism significantly. Low income level of countries and terrorism threats can be integrated at a higher level. Aftermath of terrorism cannot be denied but studying the factors that generate terrorism has much more importance to knock out the menace of terrorism by focusing on its root causes.

Therefore, rather than focusing on the consequences of terrorism, we in this paper study the impact of various determinants on the prevalent terrorism in terrorism-affected countries. Starting from the prominent factors responsible for terrorism, we also incorporate some additional factors into our models in order to observe the response of terrorism. Secondly, we also divide the sample between Muslims and non-Muslims countries to demonstrate whether or not the root causes of terrorism are universal or vary. The reasons of splitting the sample into Muslims and non-Muslim countries are that there are ideological and cultural differences in the Muslims and non-Muslim countries in terms of the determinants of terrorism.

This study, therefore, provides detailed understanding of the main factors contributing positively or negatively towards terrorism. It is expected that policy makers would find the results of this study useful and hence are expected to devise appropriate policies in order to curb the problem of terrorism.

This paper proceeds as follows. In section two, we shed some light on the root causes of terrorism. In section three, we provide basic statistics and trends in terrorism both for Muslim and non-Muslim countries. Modeling and methodology are discussed in section four while the penultimate section is devoted to results and discussion. Concluding remarks and brief policy suggestions are presented in the final section.

Determinants of Terrorism (Brief Review)

Terrorism is a complex and multidimensional phenomena and hence could be affected by various factors. The most prominent among others are the growing corruption and persisting low per capita income especially in the developing world. The Transparency International (2009) defines corruption as; “Corruption is the abuse of entrusted power for private gain”. Further, corruption is also classified as grand, petty and political, depending on the amounts of money lost and the sector where it occurs. According to the latest report of Organization of Economic Cooperation and Development (OECD; 2017), corruption is linked to terrorism in several ways. Corruption destroys the ability to eliminate terrorism, promotes international terrorism, and encourages cross-border financing of terrorism. Simpson (2014) accepted that the impact of corruption on political violence, including terrorism, is largely ignored in the available literature. Similarly, low per capita income may also motivate individuals to get involved in illegal activities where the apparent reward is greater. Caruso and Schneider (2011) documented that terrorism can arise due to lack of opportunities and poor economic conditions. Freytag et al. (2009) documented that slow economic growth and poor institutions are responsible for the prevailing terrorism. Ismail and Amjad (2014) documented that terrorism can be influenced by various factors such as inflation, political instability, poverty and unemployment, among others. Akhmat et al. (2014) reported that various macroeconomic variables such as inflation, poverty and unemployment are positively associated with terrorism in the context of South Asian economies. Enders et al. (2016) have found that income and terrorism are non-linearly associated. Freytag et al. (2011) stated that low economic growth and development are responsible for higher terrorism activities.

Political instability could also be responsible for terrorism in low efficient political territories. Political instability and conflicts lead to different socio-economic problems including terrorism. Abadie and Gardeazabal (2003) investigated the economic cost of conflicts in a Basque Country (Israel) and found that conflicts have depreciated the economic efficiency and GDP per capita by approximately 10% of the Basque country. It implies that political stability can be a supportive social element to discourage the menace of terrorism. Park and Bali (2017) believe that democratic government faces low level of transnational terrorism than autocrats. Although democratic governments have the edge over the autocrats, however, stability matters a lot irrespective of the form of the government. Walsh and Piazza (2010) are of the view that ensuring human rights may lower terrorist attacks. Social welfare is linked to human rights and their violations may cause threatening sequel.

Similarly, there could be a definite relationship between military expenditures and terrorism. Growth in expenditures on military may be helpful to eliminate the menace of terrorism. However, some studies concluded that high expenditures on defense reduce government expenditures over other sectors such as education, health, infrastructure, capital

formation, among others (e.g., Arora and Bayoumi 1993; Knight et al. 1996; Gaibulloev and Sandler 2008). It is also a fact that military expenditures have accelerated economic growth in some cases (e.g., Benoit 1978). By observing the effects of military expenditures on terrorism, Feridun and Shahbaz (2010) found a unidirectional causal impact of terrorism on defense expenditures. Government expenditures mostly used for defense results in low economic growth and higher inflation as argued by Gupta et al. (2004). Nasir and Shahbaz (2015) found that intensity of terrorism attacks causes military expenses to rise.

In addition to the mentioned variables, the stock of both physical and human capital may also affect the problem of terrorism in one way or the other. People in countries with insufficient physical and human capital may easily be attracted towards illegal activities including terrorism owing to apparent higher rewards for such activities. Krueger and Malečková (2003) are of the view that higher education may provide fuel to terrorism in some cases. Educated individuals may be encouraged to get involved in illegal activities if they think they will be leaders upon success. Benmelech and Berrebi (2007) and Krueger (2008) highlighted that human capital induces suicide bombers. Li and Schaub (2004) demonstrated that FDI, portfolio investment and trade do not have direct and positive impacts on transnational terrorism and these factors indirectly reduce terrorism. Testas (2004) studied the determinants of terrorism in Muslim countries and observed a positive relation among terrorism, education and civil war whereas income was negatively related with terrorism. Similarly, Brockhoff et al. (2010) studied the nexus of education and terrorism and explored that education and terrorism are not directly linked but they may be connected through poor political and socio-economic conditions. Furthermore, Brockhoff et al. (2015) reached at a similar conclusion and commented that education reduces terrorism and where socio-economic conditions are more stable.

Inflation is considered to affect terrorism both directly and indirectly. Shahbaz (2013) studied the relationship between inflation and terrorism and observed bidirectional causality between both. Similarly, Shahbaz and Shabbir (2011) found evidence in favor of cointegration among economic growth, inflation, and terrorism and further demonstrated bidirectional causality between inflation and terrorism. In addition to inflation, higher government spending can also affect terrorism especially in developing countries. Government spending though might be useful from the growth perspective; their impact on terrorism may be different. Terrorism results in crowding out of investment more than crowding in government spending as illustrated by Chuku et al. (2017). Terrorism activities pressurize governments to increase expenditures on defensive means to discourage terrorist activities as argued by Gaibulloev and Sandler (2009).

It could be concluded from the brief review of the relevant literature that terrorism can be affected by different factors. These include corruption, low income growth, political instability, inflation, military expenditures, government consumption expenditures and lack of both physical and human capital. Therefore, in the current paper we focus on these factors and estimate their impacts on terrorism quantitatively.

Basic Statistics on Terrorism

In the first instance, the study provides average scores of GTI for the sampled countries from 2005 to 2016. The Institute of Economics and Peace (IEP) (2014, 2016, 2017) calculates

GTI index annually. The GTI index is based on four factors such as total number of terrorist incidents, fatalities, injuries and property damages. These factors are weighted over five years and each factor is weighted between zero and three. The GTI index ranges from 0 to 10 where 0 indicates no impact from terrorism while 10 stands for highest impact of terrorism. The purpose behind this exercise is to observe the trend in terrorism over the years for the selected countries. Scores for the GTI are demonstrated in Table 1 given below.

According to the scores presented, terrorism has increased significantly, approximately 54%, for the overall sample in course of twelve years. Similarly, the division of sample into Muslims and non-Muslim countries shows that terrorism has increased more in Muslim countries than non-Muslim countries. According to the given statistics, for the Muslim countries, terrorism increased about 63.564% from 2005 to 2016. On the other hand, the non-Muslim countries also suffered from the problem of terrorism significantly during the period 2005 to 2016.

In the next step we plot annual GTI scores for the overall sample, Muslim countries and non-Muslim countries in the following Fig. 1. It could be seen from Fig. 1 that rise in terrorism is highest for the Muslims countries while the non-Muslim countries have experienced relatively lower terrorism. Similarly, overall terrorism shows an increasing trend in recent years.

Modeling and Methodology

Specification of the Empirical Model

This paper is intended to quantitatively examine the relationship between prevailing terrorism and its determinants. Terrorism can be affected by various factors owing to its complex nature. The dominant factors among others that influences terrorism in one way or the other are low per capita income, political instability, corruption and military expenditures (e.g., Ismail and Amjad 2014; Nasir and Shahbaz 2015; Simpson 2014). The current study is limited to the economic aspect of the determinants of terrorism; therefore, important dynamics especially ideological ones are not focused on. Ideological dynamics have been kept aside because of ideological variations across countries. The following baseline regression model is specified to see how the selected independent variables influence the dependent variable.

$$GTI_{it} = b_0 + b_1gpc_{it} + b_2cor_{it} + b_3mex_{it} + b_4pins_{it} + U_{it} \quad (1)$$

Table 1 Statistics on global terrorism index (GTI)

Variable	Sample	Average 2005	Average 2016	% change
GTI	Overall	2.1886	3.3851	54.6696
GTI	Muslim	2.8785	4.7082	63.5643
GTI	Non-Muslim	1.9425	2.74	41.0553

Source: Authors calculation from GTI database

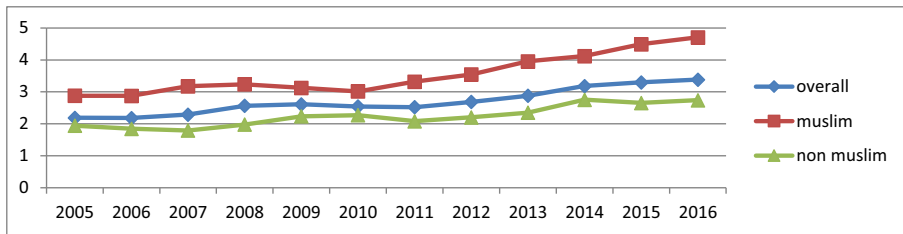


Fig. 1 Trends in terrorism

The dependent variable in Eq. (1) is the global terrorism index which is used to capture terrorism. The independent variables include the growth of real per capita GDP, the corruption perception index, military expenses as a percentage of GDP and an index of political instability.

In the next step, we introduce two macroeconomic variables such as growth of both physical and human capitals, respectively, into the model to examine the response of terrorism to these additional variables. Investments both in physical and in human capital may be helpful in curbing the menace of terrorism (e.g., Brockhoff et al. 2015). Equation (1) can be re-written after the inclusion of these additional variables as below.

$$gti_{it} = b_0 + b_1 gpc_{it} + b_2 cor_{it} + b_3 mex_{it} + b_4 pins_{it} + b_5 ghc_{it} + b_6 gck_{it} + U_{it} \quad (2)$$

In Eq. 2, the growths of both physical as well as human capitals, respectively, are included as additional determinants of terrorism. Besides, we have also included inflation and government consumption expenditures among the explanatory variables to find out whether or not they have any influence on terrorism. Both inflation and government consumption expenditures are used as determinants of terrorism in previous studies (Chuku et al. 2017; Shahbaz 2013)

$$gti_{it} = b_0 + b_1 gpc_{it} + b_2 cor_{it} + b_3 mex_{it} + b_4 pins_{it} + b_5 ghc_{it} + b_6 gck_{it} + b_7 inf_{it} + b_8 gce_{it} + U_{it} \quad (3)$$

Equation (3) includes majority of the potential determinants of terrorism. Detailed information about the sampled countries, measurement of variables and data sources are reported in appendix Tables 5 and 6 respectively.

Estimating Methodology

The nature of data to be used in the empirical analysis constitutes a panel owing to both time and cross-sectional dimensions. The most widely used models for handling panel data are the fixed and random effects techniques (e.g., Tahir and Khan 2014; Tahir and Azid 2015). The fixed effect modeling is appropriate if the independent variables and error term are correlated. However, the fixed effects modeling approach is unable to accommodate for the time invariant factors. On the contrary, though the random effects estimator is capable to handle time invariant factors, it is, however, unable to provide unbiased results if serial correlation is present between the error term and regressors. Choosing between the fixed and random effects testing is indeed complex. Hausman (1978) provided a testing procedure to select between the fixed and random effects modeling. We have employed Hausman test to decide between fixed and the random effects modeling. The results of the test are provided

in the bottom part of Table 2. According to the results, the fixed effects seem appropriate in the present case owing to the serial correlation that exists between the error term and independent variables. Similarly, we have also carried out the unit root testing in order to check the stationarity problem and also determine the order of integration of variables. Results of the unit root testing reported in the appendix Table 7 have confirmed that all variables are stationary at level and hence the order of integration is $I(0)$ for all variables.

We have estimated Eqs. (1–3) initially for the entire sample. In the second step, we have divided the sample between Muslims and non-Muslim countries and estimated Eq. (3). The purpose of this exercise is to find out whether or not the causes of terrorism are universal or varies. Results are provided for the whole sample and sub-samples in the following section.

Results and Discussion

Main Results

In Table 2, results are provided for the estimated equations. In columns 2–4, we reported regression results for the Eqs. 1–3 specified in section 3. In the last two columns of Table 2, results based on Eq. 3 for Muslims and non-Muslim countries are shown, respectively.

Table 2 Regression results

Variables	Model-1	Model-2	Model-3	Mode- 4 (Muslims)	Model-5 (Non-Muslims)
gpc	−1.577*** (0.544)	−1.671*** (0.638)	−1.655*** (0.550)	−1.785*** (0.520)	−1.504** (0.652)
cor	0.008 (0.008)	0.001 (0.007)	−0.012* (0.006)	−0.159 (0.126)	−0.012** (0.005)
mex	0.012 (0.051)	0.031 (0.065)	0.011 (0.066)	−0.234*** (0.047)	0.310*** (0.118)
pins	0.624*** (0.081)	0.624*** (0.091)	0.652*** (0.095)	0.886*** (0.160)	0.376*** (0.063)
gck		−0.946** (0.446)	−0.454* (0.283)	−0.797* (0.467)	0.285 (0.422)
ghc		−13.222*** (5.510)	−13.234*** (4.956)	−20.098*** (5.197)	−7.734* (4.782)
Inf			0.552*** (0.178)	4.308*** (0.901)	0.388*** (0.159)
gce			2.832*** (0.427)	4.440*** (1.034)	2.203*** (0.474)
Cons	0.805 (0.250)	0.959 (0.335)	−0.498 (0.513)	−1.380 (1.117)	−0.491 (0.476)
R ²	0.846	0.858	0.865	0.866	0.862
Adj R ²	0.830	0.842	0.850	0.849	0.846
F-stat	53.350	56.445	58.301	51.215	54.145
Prob F-Stat	0.0000	0.0000	0.0000	0.0000	0.0000
Hausman Chi-Sq	63.896***	50.901***	75.006***	33.001***	44.314***

Dependent variable is the global terrorism index

***, **, * stands for 1%, 5 and 10% significance level respectively

The results indicate the growth of real per capita GDP carrying a negative coefficient and further this relationship is statistically different from zero at standard level of significance. The point estimate suggests that the impact of the growth of per capita income is highest among other variables. It implies that low per capita income is responsible for the prevailing terrorism especially in low-income developing countries. Results are consistent with Freytag et al. (2011) and Akhmat et al. (2014) who concluded that economic growth and development can help countries to eliminate the problem of terrorism. People would be forced to involve in illegal and dangerous activities such as terrorism in order to fulfill their needs in economies where per capita income growth is not sufficient. Conversely, a rise in per capita income would be helpful to eradicate the problem of terrorism. Similarly, results have also revealed that political instability has impacted terrorism both positively and significantly. The point estimate suggests that political instability has the second highest impact after the growth in per capita income on terrorism. It implies that political instability is one of the prominent reasons behind the ever-increasing terrorism. Political instability is indeed a complex phenomenon and it influences terrorism in one way or the other. Therefore, to eradicate the prevailing terrorism, policy makers are suggested to take serious efforts in order to ensure political stability.

As far as the relationship between corruption and terrorism is concerned, the results demonstrate that corruption is positively linked with terrorism for the sample as a whole. As the corruption perception index ranges from 0 to 10 where 0 stands for highest level of corruption and 10 stands for lowest corruption, therefore, the positive coefficient of corruption indicates movement towards lower corruption which means that decrease in corruption results in an increased terrorism. However, this relationship is not different from zero statistically. It means that corruption cannot be blamed for causing terrorism. Other factors are even more important in promoting terrorism as compared to corruption such as low income growth and political instability. The insignificant impact of corruption on terrorism did not alter even after introducing the growth of physical and human capitals into the model as shown in column 3. The results of column 4 where we incorporated additional control variables such as inflation and government consumption revealed that corruption carries a negative coefficient, showing that decrease in corruption influences terrorism negatively. Both higher inflation and government consumption can contribute to terrorism as they have negative impact on the income of growing population due to which terrorism may increase. The findings of the last two columns demonstrate that a decreased corruption negatively impacts terrorism both in Muslim as well as in non-Muslim countries. However, in case of Muslim countries, the relationship of corruption is insignificant with terrorism.

Moreover, the findings regarding the relationship between military expenditures and terrorism are against our prior expectations. We found that military expenditures have an insignificant positive impact on terrorism for the entire sample. Similarly, the results reported in columns 3 and 4 confirm that military expenditures are positively linked with terrorism. It is indeed difficult to pin down the possible reasons for this unexpected positive impact that military expenditures have on terrorism. Baciu (2017) provided statistics suggesting that since 9/11 military expenditures have increased globally but interestingly terrorist activities has also been increased by 650% in 2015 in OECD countries. However, the results reported in the last two columns indicate that in the context of Muslim countries, military expenditures have expectedly reduced terrorism. The classic example to support the findings is the economy of Pakistan where different military operations over the years

have almost eradicated the problem of terrorism. Similarly, Iraq and Afghanistan along with Syria are moving toward a more peaceful regime than before. In addition, the grand alliance against terrorism formed under the Kingdom of Saudi Arabia is also expected to ensure peace specifically in the Islamic world.

On the other hand, the results shown in last column of Table 2 highlighted that military expenditures in non-Muslim countries have actually provided fuel to terrorism activities. According to the results, military expenditures have impacted terrorism not only positively but also significantly. These results are not only surprising but also in contradiction with the results obtained for the Muslim countries. There could be various reasons to be responsible for the positive impact that military expenditures has on terrorism.

The growth of both physical and human capitals appeared to be useful in bringing an end to terrorism for the countries under consideration. Investment in physical capital and human capital creates not only job opportunities but also creates awareness among the larger portion of population about illegal activities such as terrorism. These findings are consistent for all the equations estimated (see columns 3–6). However, the growth of physical capital appeared to be insignificant for non-Muslim countries.

Robustness Testing

In this section, we have employed a different methodology to test robustness of the findings reported in Table 2. Following Chen and Gupta (2009), we have changed the estimating methodology from fixed effects OLS to fixed effects GLS (generalized least squares) as it is considered to be the robustness testing of fixed effects estimator. Thus, we have estimated models 3–5 using GLS method and the results are shown in Table 3.

The GLS based findings are shown in column 2 for the whole sample and 3&4 for Muslims and non-Muslims countries, respectively. The results indicated that the earlier results reported in Table 2 does not change by adopting a different methodology of estimation. Like the earlier findings, we found that the growth in per capita income and higher political instability are the main factors behind the prevalent terrorism for the entire sample, Muslims countries as well as non-Muslim countries. Likewise, corruption also emerged as an insignificant factor behind the prevailing terrorism. Similarly, military expenditures have maintained their dual role of positive and negative relationships with terrorism in non-Muslim and Muslim countries, respectively.

Moreover, the positive impacts of inflation and government consumption on terrorism are also robust in the GLS based estimation. Lastly, we observed that the growth of human as well as physical capital slightly altered. It is revealed that human capital growth has a negative impact on terrorism in the whole sample and Muslim countries while in non-Muslim countries its relationship is reversed. Physical capital growth is found to be having terrorism reducing impact for the sample as whole and non-Muslim countries while in case of Muslim countries, its impact on terrorism is vanished.

The values of Adjusted R-Squared reported in lower part of Table 3 reflect that explanatory variables explain variation in terrorism significantly. The explanatory power ranges from 0.927 to 0.984 which is the indication of relevancy of the independent variables with respect to the dependent variable. Moreover, the F-test has confirmed the fitness of all three estimated models.

Table 3 Robustness testing of findings

Variables	Overall Sample	Muslim	Non-Muslim
gpc	-1.021*** (0.191)	-1.501*** (0.432)	-0.805** (0.244)
cor	-0.007 (0.006)	0.011 (0.145)	-0.007 (0.001)
mex	-0.104** (0.047)	-0.258*** (0.035)	0.069*** (0.073)
pins	0.373 (0.041)***	0.707*** (0.132)	0.198*** (0.049)
gck	-0.656** (0.308)	0.001 (0.461)	-0.468** (0.237)
ghc	-1.504 (2.844)	-19.595*** (5.124)	4.218 (2.672)
Inf	0.410*** (0.111)	3.324*** (0.709)	0.353*** (0.115)
gce	2.089*** (0.273)	4.001*** (0.732)	1.535*** (0.181)
Constant	0.872 (0.210)	-0.748 (0.821)	0.725 (0.250)
R^2	0.974	0.936	0.986
Adj R^2	0.972	0.927	0.984
F -stat	352.736	115.496	608.324
Prob F -Stat	0.0000	0.0000	0.0000

Dependent variable is the global terrorism index. ***,** stands for 1 and 5% significance level respectively

Causality Analysis

In this section, we focused to investigate causality among the variables. It is possible that there may be causal relationship among the variable owing to the fact that in most of the cases macroeconomic variables affect each other in one way or the other. To serve this purpose, we have estimated the pairwise granger causality. Results are demonstrated in the following Table 4.

The causality results presented in Table 4 demonstrated bidirectional causality between political instability and terrorism and corruption and political instability. It implies that political instability, terrorism and corruption are interrelated for the sampled countries. Similarly, a bidirectional relationship is observed between government consumption and inflation and the growth of per capita GDP and the growth of physical capital.

Moreover, we also found unidirectional causality which is running from the growth of per capita GDP towards the growth of human capital, military expenditures and political instability. It means that the growth of per capita GDP is the main determinant behind the growth of human capital, military expenditures and political instability. Similarly, military expenditures are found to be exerting unilateral causal impact on both government expenditures and the growth of physical capital stock. In other words, government expenditures and the growth of physical capital are dependent upon military expenditures. It is also observed that corruption is causing both the growth of per capita GDP and government expenditures. The results also revealed one way causality between

Table 4 Pairwise granger causality tests

Null hypothesis	Obs	F-Stat	Prob	Null hypothesis	Obs	F-Stat	Prob
GCK to GTI	711	1.58812	0.2050	INF to GHC	711	0.81464	0.4432
GTI to GCK		0.99010	0.3721	GHC to INF		0.21526	0.8064
GHC to GTI	711	0.04304	0.9579	GCE to GHC	711	1.29010	0.2759
GTI to GHC		2.13071	0.1195	GHC to GCE		0.36511	0.6943
MEX to GTI	790	0.47913	0.6195	CPI to GHC	711	0.18965	0.8273
GTI to MEX		1.46444	0.2318	GHC to CPI		0.20627	0.8137
GPC to GTI	711	0.69473	0.4996	GPC to MEX	711	4.50076**	0.0114
GTI to GPC		0.28973	0.7486	MEX to GPC		1.19245	0.3041
PINS to GTI	790	3.64651**	0.0265	PINS to MEX	790	2.05262	0.1291
GTI to PINS		11.6413***	0.00001	MEX to PINS		1.78889	0.1678
INF to GTI	790	0.14497	0.8651	INF to MEX	790	0.00724	0.9928
GTI to INF		0.25379	0.7759	MEX to INF		0.32170	0.7250
GCE to GTI	790	0.36726	0.6927	GCE to MEX	790	0.81901	0.4412
GTI to GCE		1.02793	0.3582	MEX to GCE		3.07759**	0.0466
CPI to GTI	790	0.55895	0.5720	CPI to MEX	790	0.24872	0.7799
GTI to CPI		3.07752**	0.0466	MEX to CPI		1.96065	0.1415
GHC to GCK	711	1.95615	0.1422	PINS to GPC	711	0.26956	0.7638
GCK to GHC		2.76674*	0.0635	GPC to PINS		2.77650*	0.0629
MEX to GCK	711	3.42336**	0.0331	INF to GPC	711	5.22922***	0.0056
GCK to MEX		2.07665	0.1261	GPC to INF		1.01098	0.3644
GPC to GCK	711	2.59653*	0.0752	GCE to GPC	711	10.6676***	0.00003
GCK to GPC		3.88420**	0.0210	GPC to GCE		0.17357	0.8407
PINS to GCK	711	1.90885	0.1490	CPI to GPC	711	5.01812***	0.0069
GCK to PINS		0.30246	0.7391	GPC to CPI		0.02230	0.9779
INF to GCK	711	2.16096	0.1160	INF to PINS	790	0.66651	0.5138
GCK to INF		0.05551	0.9460	PINS to INF		1.37830	0.2526
GCE to GCK	711	0.53082	0.5884	GCE to PINS	790	1.79748	0.1664
GCK to GCE		0.70079	0.4965	PINS to GCE		0.57456	0.5632
CPI to GCK	711	1.15558	0.3155	CPI to PINS	790	3.52538**	0.0299
GCK to CPI		0.10478	0.9005	PINS to CPI		9.57494***	0.00008
MEX to GHC	711	0.87195	0.4186	GCE to INF	790	7.31852***	0.0007
GHC to MEX		0.35960	0.6981	INF to GCE		7.01315***	0.0010
GPC to GHC	711	8.72509***	0.0002	CPI to INF	790	0.31092	0.7329
GHC to GPC		0.46390	0.6290	INF to CPI		0.44251	0.6426
PINS to GHC	711	2.46207*	0.0860	CPI to GCE	790	5.44029***	0.0045
GHC to PINS		0.87619	0.4168	GCE to CPI		2.02988	0.1320

Note: Where ***, **, * stands for 1 %, 5% and 10% significance level respectively

terrorism and corruption, political instability and the growth of human capital, the growth of physical capital and the growth of human capital, inflation and the growth of GDP per capita and government consumption expenditures and the growth of per capita GDP.

Concluding Remarks

This paper has tried to study the impact of different factors on terrorism of countries. The paper focused on a comprehensive sample of 94 countries which were affected from the problem of terrorism. Furthermore, the paper divided the entire sample into Muslim and non-Muslim countries to figure out whether the determinants of terrorism are universal or vary owing to different religions of countries. Appropriate econometric techniques are employed to extract results from the data spanning from 2005 to 2016.

Our findings are indeed interesting. Firstly, the study found that low per capita income growth and political instability are the main driving forces behind prevailing terrorism, in Muslim as well as in non-Muslim countries. Secondly, the results revealed that the growth of both physical and human capital stocks are inversely related with terrorism in entire sample as well as for Muslim countries implying that they could be used as tools to curb the problem of terrorism. In case of non-Muslim countries we found that the growth of physical capital is positively while the growth of human capital stock is negatively connected with terrorism. However, these relationships are insignificant statistically. Thirdly, we could not find strong evidence in favor of hypothesis that corruption can be the main cause of terrorism as it is insignificant in majority of the specifications. Fourthly, the results demonstrated the military expenditures have insignificant but positive impact on terrorism for the sample as a whole. However, the division of sample between Muslims and non-Muslims countries yields surprising results. In case of Muslim countries, military expenditures have helped to eradicate terrorism problem while in non-Muslim countries; terrorism is positively influenced by rising military expenditures. Furthermore, it is also observed that inflation rate as well as rising government expenditures also provides fuel to rising terrorism. The causality analysis revealed bidirectional causality between political instability and terrorism, political instability and corruption, government consumption and inflation and the growth of GDP per capita and the growth of physical capital stock. Similarly, some one way causalities are also observed for some of the variables.

Policy Recommendations

The paper recommends that policy makers both in Muslim as well as in non-Muslim countries could take some serious steps to increase the low per capita incomes and also ensure political stability that as to eradicate the prevailing problem of terrorism.

Investments both in physical and human capital can be given priority especially in affected areas both in Muslim and non-Muslim countries. As it will provide job opportunity to the growing masses which will increase their income and as a consequence, the terrorism would be adversely affected.

Compliance with Ethical Standards

Conflict of Interest/Ethical Statement The author declares no conflict of interest. I would also like to confirm that this paper is an outcome of author's own work and was not published elsewhere neither is considered for publication elsewhere.

Appendix

Table 5 List of countries

Afghanistan	Guinea	Nigeria
Albania	Guinea-Bissau	Pakistan
Algeria	Guyana	Papua New Guinea
Angola	Honduras	Paraguay
Argentina	India	Peru
Armenia	Indonesia	Philippines
Azerbaijan	Iran	Romania
Bangladesh	Iraq	Russia
Belarus	Jamaica	Rwanda
Bolivia	Jordan	Senegal
Bosnia and Herzegovina	Kazakhstan	Serbia
Brazil	Kenya	Sierra Leone
Bulgaria	Kyrgyzstan	Somalia
Burkina Faso	Laos	South Africa
Burundi	Lebanon	Sri Lanka
Cambodia	Lesotho	Sudan
Cameroon	Liberia	Syria
Central African Republic	Libya	Tajikistan
Chad	Macedonia	Tanzania
China	Madagascar	Thailand
Colombia	Malaysia	Timor-Leste
Congo	Mali	Tunisia
Cote d'Ivoire	Mauritania	Turkey
Croatia	Mexico	Uganda
Democratic Republic of Congo	Moldova	Ukraine
Dominican Republic	Morocco	Venezuela
Ecuador	Mozambique	Viet Nam
Egypt	Myanmar	Yemen
Ethiopia	Namibia	Zambia
Georgia	Nepal	Zimbabwe
Ghana	Nicaragua	
Guatemala	Niger	

Table 6 Variables sources and definitions

Brief	Variables	Definitions	Range	Sources
GTI	Global terrorism index	Terrorism is use of illegal force to attain a social or economic goal	Ranges from 0 to 10 0 indicates no terrorism while 10 indicated highest terrorism impact	Economicsandpeace.org (IEP)
Cor	Corruption perception index	Abuse of entrusted power for private gain	Ranges from 0 to 10 Where 0 indicates highest corruption and 10 indicates lowest corruption	Transparency International
Gpc	GDP per capita	Gross domestic product per capita constant 2010 U.S dollars	Growth rate is calculated by taking log differences	UNCTAD
Mex	Military expenditure (% GDP)	Current and capital expenditures on the armed forces		World Development Indicator
Pins	Political terror scale	Violation of basic human rights by agents of State	Ranges from 0 to 5 Where 0 indicates no political terror while 5 indicates highest political terror.	www.politicalterroryscale.org
Ghc	Human capital	Human capital index, based on years of schooling and returns to education	Growth rate is calculated by taking log differences	PWT 9
Gck	Capital stock	Capital stock at current PPPs (in mil. 2011US\$)	Growth rate is calculated by taking log differences	PWT 9
Inf	Inflation	Price level of household consumption, price level of USA GDP ₀ in 2011 = 1		PWT 9
Gce	Government consumption	Price level of govt. consumption, price level of USA GDP ₀ in 2011 = 1		PWT 9

Table 7 Unit root testing

Variables	Level	First Difference	Decision
Gti	-2.190**	-14.321***	I(0)
Gpc	-3.884***	-17.302***	I(0)
Cor	-2.449***	-8.604***	I(0)
Mex	-6.147***	-15.959***	I(0)
Pins	-6.464***	-22.016***	I(0)
Gck	-5.019***	-18.962***	I(0)
Ghc	-4.461***	-22.022***	I(0)
Inf	-4.518***	-16.397***	I(0)
Gce	-4.776***	-7.638***	I(0)

***, ** stands for 1 and 5% significance level respectively

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