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Terrorism and India: an economic perspective

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Abstract This study seeks to evaluate the terrorism and economic performance of the economy of India from the year 2004 to the year 2013. The analysis of the study is based on the model of Economics of Terrorism Monitoring Model (ETM-Model) introduced by Khan et al. (Qual Quant, 2015). The main objective of this research study is to scrutinize the terrorism situation in the economy of India. The effects of terrorism on the economic performance is measured by economic desgrowth. The economic desgrowth generated from economic growth rate due to terrorism in the year 2004 for the Indian economy is −0.91 %, while the economic desgrowth for the year 2013 of the same economy is −2.05 %. The study concludes that terrorism is one of the main issue of the Indian economy from the economic perspective. Indian government may work with Pakistan to resolve the issue of Jammu and Kashmir to overcome the terrorism issue. It is also needed for the Indian economy to make harmony between Muslims and Hindu with in the territory of India.

Keywords Terrorism · Economic desgrowth · India

JEL Classifications R11 · R12

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1 Introduction

There is a complex type of relationship between terrorism and economic performance. On the one side, terrorism may be affected the economic growth negatively, but on the other side, strong economic performance may generate less terrorism. The general perspective about terrorism is that terrorism is considered as a threat to economic performance. Among other factors, terrorism is one of the main factor which generates destabilization, uncertainty, and reduces economic growth. Frey and Luechinger (2003) suggested that terrorism problem may be solved by increasing the opportunity costs of terrorism. When there is economic prosperity, then the potential terrorist groups will have additional economic alternative such as jobs, employment opportunities, and reduction in poverty and relative deprivation and this will further increase the opportunity costs of terrorism.

The number of terrorism incidents occurred in developing economies are for larger than the developed economies. The Global Terrorism Database Report[1] (2013) explains that the top ten economies affected by terrorism are from developing countries. This research work is related with one of the developing economy, India, which is one of the most affected economy by terrorism in 2013. The Indian economy is the second highest populated economy of the world and the world best democratic system, but at the same time, the disputes between Hindu–Muslim ethnic groups, Indo-Pak tension and Jammu and Kashmir freedom fighting have strongly affected the economic performance of Indian economy. Ram (2013) said that due to huge population, if only 1 % of the whole population is involved in terrorism, this will simply mean that at least 12 million people are the potential terrorists.

2 An overview of economic performance and terrorism situation of India

The formal name of India is Republic of India. The capital city of the country is New Delhi (officially called the national capital territory of Delhi). India has got independence from Britain on 15th, August 1947. Before independence this area was jointly called Sub-Continent (India and Pakistan). The major cities of India are Mumbai, Kolkata, Chennai, Ahmadabad and Hyderabad. The boundaries of the India are touched in the north-west with Afghanistan and Pakistan, in north with China, Bhutan and Nepal, in east with Bangladesh. The total area of the country is 3,287,590 Km^2. India is the second highest populated country after China in the world. The total population of India is 1.2 billion. From 1947 to the late 1970s, the Indian economy was considered as agrarian based economy and mainly produced primary products such as fishing, forestry and textile manufacturing products. But during 1980s and 1990s the economy had been shifted from central government planning to private sector. During 1990s, the government has adopted liberalized policies such as privatization of government owned industries and reduced the tariff rates on imported products. The economic growth during 1990s was around 4–7 % per year. In the last decade, Indian economy was one of the leading economy as its GDP growth rate almost touches 10 % per year. From 1980s to 2001, the labour force has increased from 245 million to 402 million persons. The imports volume of Indian economy was $467.5 billion in 2013, while exports volume for the same year was $313.2 billion. The major imported products of Indian economy are petroleum products, capital goods, machinery,

[1] It is recorded by the National Consortium for the Study of Terrorism and Responses to Terrorism (START), based at the University of Maryland. Web Link: http://www.start.umd.edu/gtd/.

and fertilizers. The major exported products are textile goods, gems and jewellery, engineering goods chemicals, and leather and leather goods. The major countries of Indian exports are United States, China, Japan and European Union.

Terrorism is the main issue of Indian economy from its first day of independence. The great political leaders of this country like Mahatma Gandhi, Indira Gandhi and Rajiv Gandhi had been assassinated by the terrorist groups. The bird eye view of the terrorism situation in India during 1st August 2010 and 31st July 2011, explains that 1012 number of incidents occurred. During the last decade from 2006 to 2013, 4100 number of different terrorist attacks had been done. The main causes of terrorism in India are the dispute of Jammu and Kashmir, boarder issue with Pakistan, and ethnic group problem between Muslim and Hindus. The India has faced 70 % more number of incidents of terrorism from the year 2012 to the year 2013. The number of deaths has increased from 238 to 404. According to the Global Terrorism Database report (GTD) 2014, three Islamist groups have accepted the responsibility for around 15 % of deaths. In September 2014, al-Qa'ida has announced his presence in India. The mostly affected area of terrorism is the city of Hyderabad, where 40 % of Muslim population are living. There were some separated groups such as Assam, Bodoland, Kamtapur and Meghalaya who were responsible for 16 % deaths.

3 Theoretical framework

Economic theory postulates that terrorism incidents and terrorist attacks can reduce economic growth and generate poor economic performance. The rational choice theory explains that the main goal of the terrorists is to destabilise the economy. There are two economic agents, one is government and other is the terrorist groups. On one side from rational perspective, the government can weight the costs of accepting demands of terrorists and the costs of economic damaged in case of not fulfilling the terrorist demands. So if the terrorist are going for the terrorist activities, it means that economic damage due to terrorism becomes comparatively less costly as compared to the acceptance of terrorists demands (Sandler and Enders 2008). The main aim of this study is to quantify all possible leakages that occurred due to terrorism from the economy of India. The other economic theory "immiserizing modernization theory" elucidates that economic performance and terrorism have two way connection, if the benefits of economic performance could not be shifted through trickle-down effect to poor people of the economy. The poor economic performance encourages income inequality, and therefore poverty is prevailed in the economy. The increase in the level of poverty diminishes the opportunity cost of terrorism which favours the poor masses to go for terrorism incidents and other types of terrorism attacks. This theory describes the economic performance and vicious circle of terrorism (Shahbaz 2013). The relative deprivation which is generating terrorism is explained by Gurr (1970). When there is relative deprivation in the people, the inequality is produced, which compels the people for doing suicide and other types of terrorist attacks.

4 Evaluation of Terrorism Monitoring Model (ETM-Model)

The Evaluation of Terrorism Monitoring Model (ETM) by Khan et al. (2015) is used in this research work. Originally, the ETM model is based on Economic of Crime Monitoring (ECM-Model) presented by Ruiz Estrade and Ndoma (2014). The model shows the linkage between gross national product (GNP) and terrorism incidence.

In this study terrorism is taken as vulnerability and its impact on economic growth. The ETM model reflects the effect of terrorism on economic development at different stages and different time periods. The impact of terrorism and its destruction on gross domestic product (GDP) cannot be neglected. Although, the dynamics of terrorism is not important so far but its quantification assessment is of great importance for future policy makers.

The ETM-Model is adopted to understand that how GDP growth rate is linked to the terrorist attacks and incidents. The ETM-Model has five sub-parts which are as follows (a) The total terrorism frequency rate (β), (b) The national terrorism vulnerability rate (μ_T), (c) The terrorism devastation magnitude rate (λ), (d) The economic desgrowth rate (δ), and (e) The terrorism vulnerability surface.

The above five sub-parts of ETM-Model focus on varied level of vulnerability and devastation occurred after terrorist attacks and incidents. For this purpose, time series data on basis of terrorism activities is used. The economy faced two types of effects by these terrorist activities which include capital devastation magnitude rate and human capital devastation.

Furthermore, the economic desgrowth which measures the possible leakages that are leaked from economic growth rate because of terrorism incidents and terrorist attacks. The main idea of the economic desgrowth is to assess the possible impact of terrorism incidents and attacks on the final GDP growth rate over time span.

To evaluate, twelve different terrorism indicators and data on various types of terrorist attacks are used. These terrorism activities and its types comprises of suicide, assassination, hijacking, kidnapping, barricade, bombing, unknown, armed assaults, unarmed assaults, infrastructure, number of killed and number of wounded.

5 Results of the model

Result of the model is distributed into the following sub parts.

5.1 The application of ETM-model for Indian economy

The application of ETM-Model for Indian economy shows that how much the terrorism has affected poorly the economic performance of the country. Before going into the explanation of results of the model, we just go through the terrorism condition in India.

The terrorism started in India from the day first of independence in 1947. The main issues of the Indian economy regarding terrorism are that on one side there is an issue of Hindu–Muslim ethnic conflict and on the other important side, the issue with Pakistan and the freedom fighting scenario in Jammu and Kashmir. The main cities which are affected by terrorism are Bombay, Uttar Pradesh, Gujarat, Hyderabad and Ahmadabad. In the year 2002, the conflict between Hindu and Muslim have lost the lives of 790 Muslims and 254 Hindu, while 2500 people were injured (Figs. 1, 2).

5.2 The total terrorism frequency rate of Indian economy

For the total terrorism frequency rate of Indian economy, the terrorism vulnerability propensity rate is measured. The terrorism frequency rate (Fig. 3) demonstrates the terrorism growth rates of Indian economy. Figure 3 of terrorism frequency rate further describes that risk of highest terrorism activities is by unarmed assault with 34.7 % in

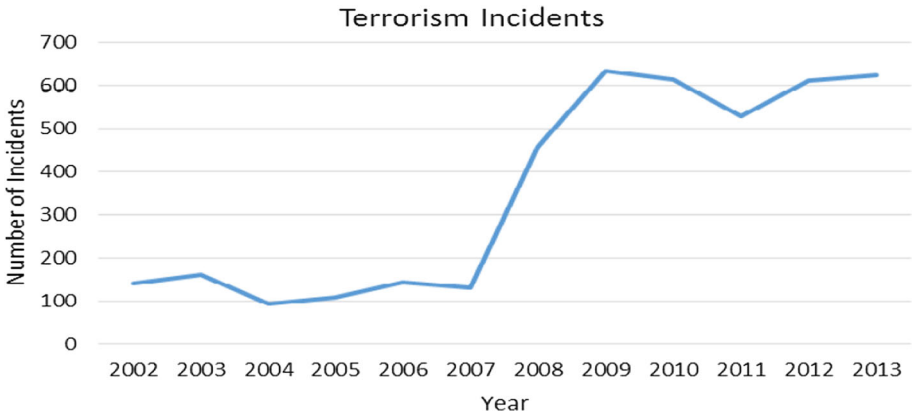

Fig. 1 Terrorism incidents in Indian economy. *Source* GTD 2014

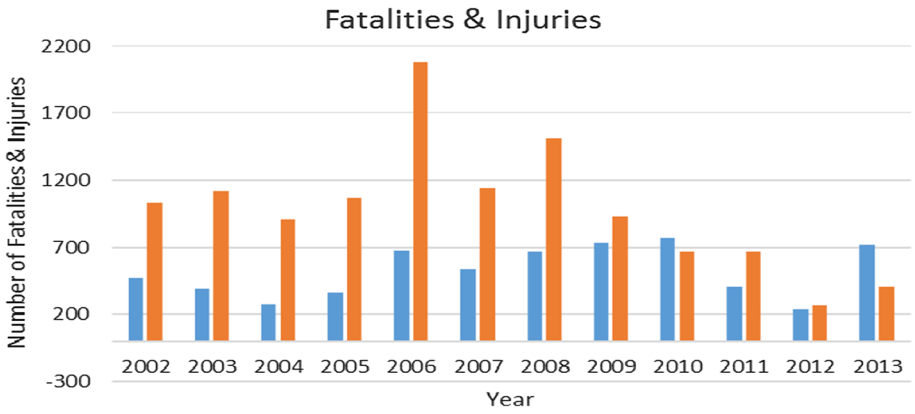

Fig. 2 Fatalities and injuries in Indian economy. *Source* GTD 2014

Indian economy. The 2nd highest terrorism frequency rate is occupied by armed assault with 33.4 % in this South Asian country. The 3rd highest place in terrorism frequency rate of Indian economy is shared by bombing attacks with the value 31.4 %.

The terrorism vulnerability surface (VV-Surface) of Indian economy is explained in Figs. 4 and 5 of the study. Figure 4 of VV-Surface is drawn for the year 2004 of the economy of the India, while Fig. 5 explains the VV-Surface of the economy of India for the year 2013. All the estimated statistics describe that terrorism incidents are very few for the economy of India for the year 2004, while it has been increased drastically for the year 2013 of the Indian economy.

5.3 The Indian economy terrorism vulnerability rate (Ω_T): max and min

According to estimated statistics of the Indian economy, it has terrorism vulnerability rate (Ω_T) with (Ω_{Tmin}) = 0 and (Ω_{Tmax}) = 0.96. This shows the variation among the value of terrorism frequency rate in the economy of India.

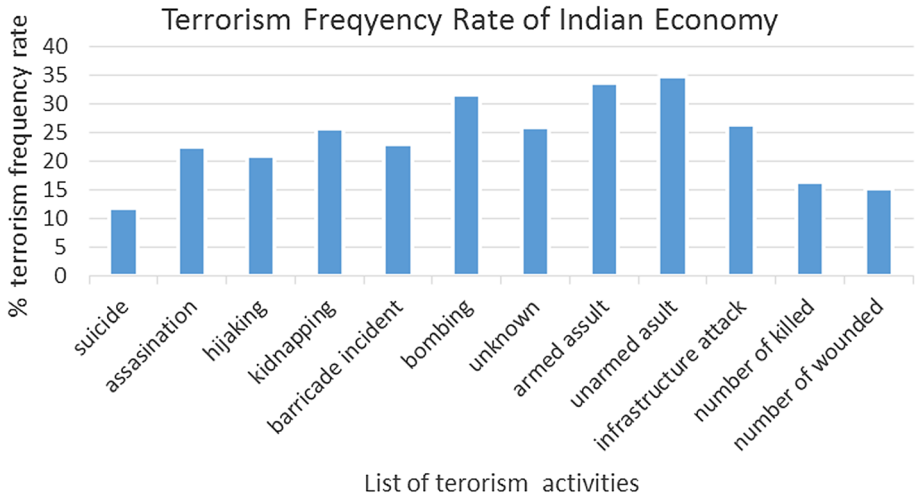

Fig. 3 Terrorism frequency rate of India economy. *Source* Authors own

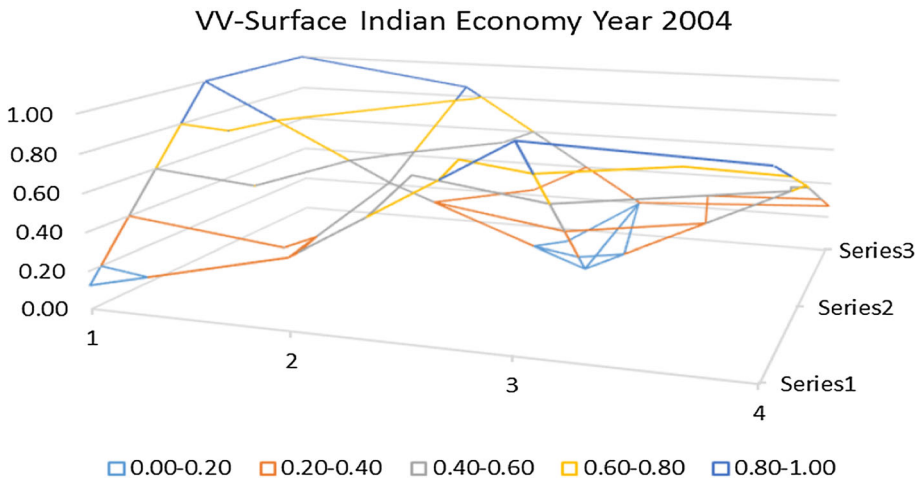

Fig. 4 VV-surface of Indian economy year 2004. *Source* Authors own

5.4 The terrorism devastation magnitude rate of Yemen economy

The terrorism devastation magnitude rate (π) of Indian economy between the year 2004 and 2013 is measured. The results of the terrorism devastation magnitude rate explain the level of devastation of the economy of India. The results of the model indorse that the devastation generated due to terrorism was very few at 1.5 % for the year 2004 of the study. On the other hand, the terrorism devastation magnitude rate value for the year 2013 of the Indian economy is 17.35 %. All these results of the model favour that Terrorism Devastation Magnitude Rate (π) in the year 2013 of Indian economy has generated far more devastation economy of India as related to the year 2004 of the economy of India.

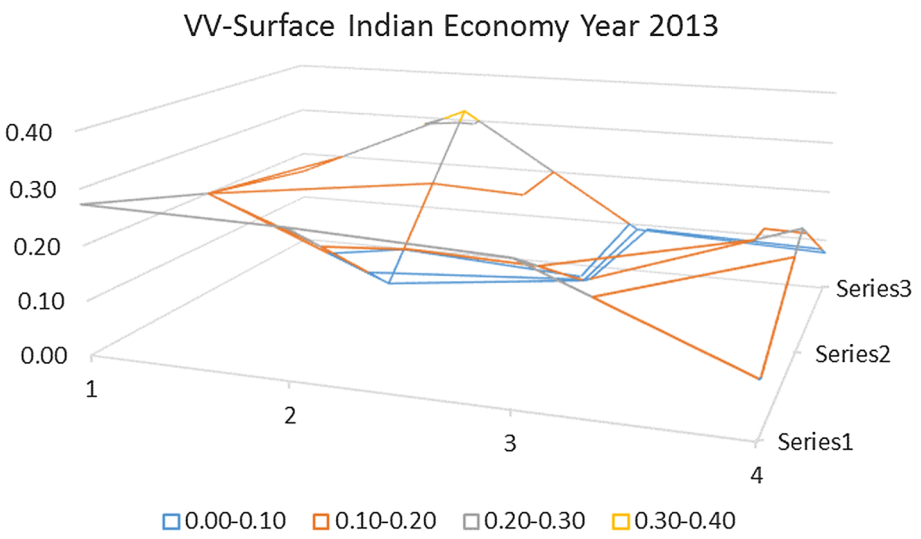

Fig. 5 VV-surface of Indian economy year 2013. *Source* Authors own

5.5 Economic desgrowth of Indian economy

The last results of the study is linked to the economic desgrowth of economy of India. Economic desgrowth measures the leakages occurred in the economy from economic growth rate because of terrorism incidents and terrorist attacks. This innovative model economic desgrowth (δ) is introduced by Ruiz Estrada et al. (2014). The main objective of economic desgrowth is to detect possible leakages from gross national product (GNP) that is generated due to terrorism incidents and other various types of terrorist attacks. The results of economic desgrowth for the year 2004 of the Indian economy—0.91 % and for the year 2013 of the said economy is −2.05 %. The statistics of the economic desgrowth conclude that economic desgrowth generated due to terrorism in the year 2013 of the Indian economy is too much

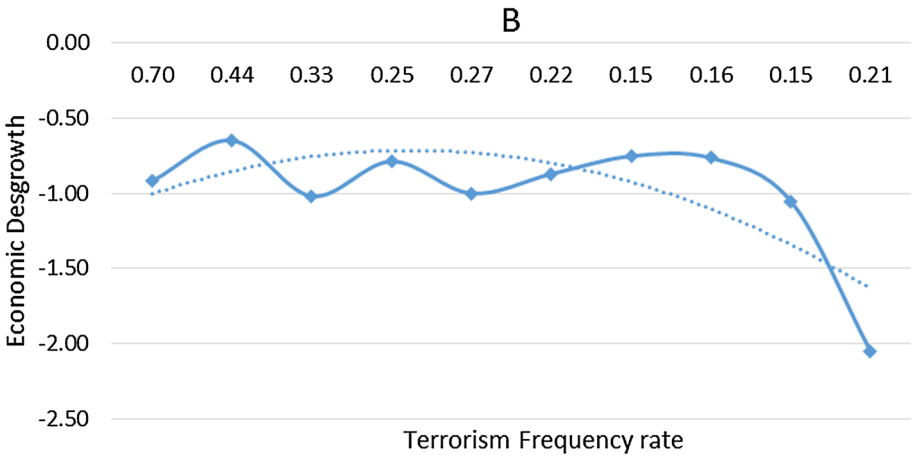

Fig. 6 Terrorism frequency rate and economic desgrowth of economy of India. *Source* Authors own

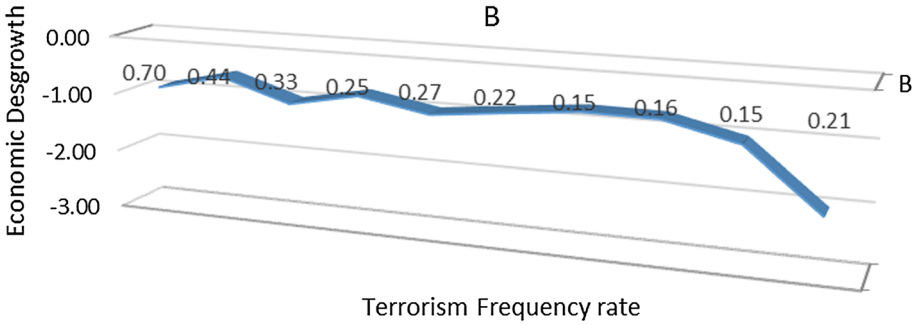

Fig. 7 Terrorism frequency rate and economic desgrowth of economy of India. *Source* Authors own

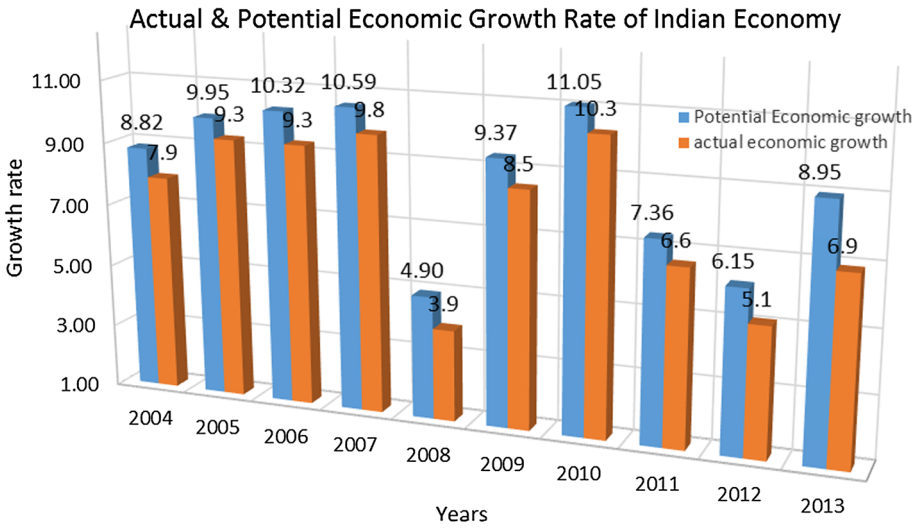

Fig. 8 Actual and potential economic growth rate of Indian economy. *Source* Authors own

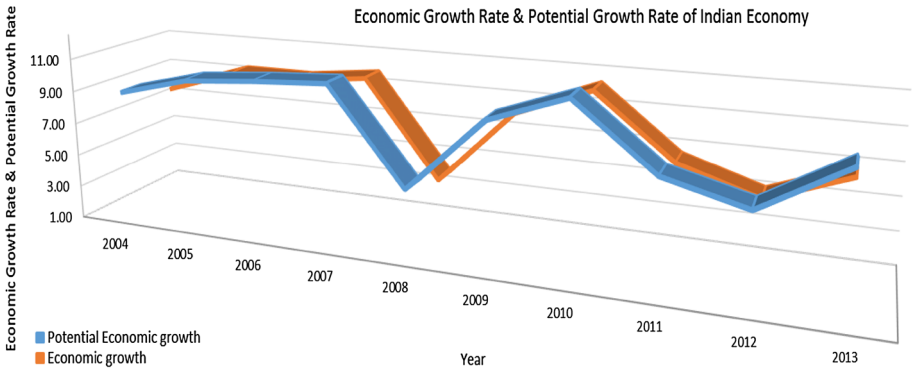

Fig. 9 Actual and potential economic growth rate of Indian economy. *Source* Authors own

Table 1 Economic growth, economic desgrowth and terrorism frequency rate of Indian economy

Year	Economic growth rate	Economic desgrowth	B
2004	7.9	−0.91	0.70
2005	9.3	−0.64	0.44
2006	9.3	−1.01	0.32
2007	9.8	−0.78	0.24
2008	3.9	−0.99	0.26
2009	8.5	−0.87	0.21
2010	10.3	−0.75	0.15
2011	6.6	−0.76	0.15
2012	5.1	−1.05	0.15
2013	6.9	−2.05	0.21

Source Authors own and World Bank (2014)

high as compared to the value of the economic desgrowth for the year 2004 of the economy of India. The economic desgrowth calculated for the Indian economy is less than the economic desgrowth measured for the economies of Iraq and Syria (Khan and Ruiz Estrada 2015). The range between economic desgrowth between the year 2004 and 2013 is −1.14 % for the economy of India according to the last estimated results (Figs. 6, 7, 8, 9).

The difference between actual economic growth rate and potential economic growth rate (zero terrorism) is calculated through economic desgrowth for the economy of India. These statistics explain that how the actual economic growth is negatively affected by terrorism and when there is no terrorism what will be the position of the economic growth. The gap between actual economic growth and potential economic growth for the year 2013 of the Indian economy is 2.05 % (Figs. 8, 9; Table 1).

6 Conclusion and policy recommendations

The objective of this research study is to evaluate the overview of terrorism and its impacts on economic performance of the economy of India. The data is used from year 2004 to 2013 to examine the relationship between terrorism and economic performance of Indian economy. The analysis of the model is based on the Economics of Terrorism Monitoring Model (ETM-Model). The estimated results of the study endorse that the economic desgrowth generated by terrorism incidents and various types of terrorist attacks in the economy of India during the year 2013 is −2.05 %, while, in the year 2004 the economic desgrowth is −0.91 %. All these statistics of economic desgrowth demonstrate that how the Indian economy is poorly suffered by terrorism in the form of economic desgrowth.

The study suggests that India, as India has one of the best democratic government, would resolve the issues with Pakistan including the disputed issue of Jammu and Kashmir. The different reports show that two-third of fatalities in India has been linked with Kashmir issue. The major insurgent groups are Lashkar-e-Taiba, Jaish-e-Muhammad, Harkat-ul-Mujahedeen, the Communist Party of India and the United Liberation Front of Assam. The government of India should work to reduce poverty and relative deprivation in the country and also to resolve the ethnic group problem between Muslims and Hindus. The terrorism issue may be further solved in India by providing justice and freedom to all masses of population irrespective of religion and race.

Appendix

The national terrorism vulnerability rate (μ_T)

In order to measure national terrorism vulnerability rate, one should estimate the total terrorism frequency rate (β_i) which is the ratio of a particular terrorism incident in an explicit year divided by the total terrorism frequency rate cumulatively (Eq. 1).

$$\beta_i = \frac{\beta_{i,t=T}}{\sum_{t=T-9}^{t=T} \beta_{i,t=T}} \tag{1}$$

The value of terrorism frequency rate will be in between zero and one. As given in Eq. 2 as below

$$0 \leq \beta_i \geq 1 \tag{2}$$

We take into account that terrorism incident and attacks can take place at any place and any time because these incidents are unpredictable and uncertain. The frequency rates of nominated twelve different terrorism activities and types of terrorist attacks are as follow, suicide (β_1), assassination (β_2), hijacking (β_3), kidnapping (β_4), barricade (β_5), bombing (β_6), unknown (β_7), armed assaults (β_8), unarmed assaults (β_9), infrastructure (β_{10}), number of killed (β_{11}) and number of wounded (β_{12}). The various terrorism incidents and types of terrorist attacks have different intensity depending on their nature, magnitude and location. The hypothesis of the ETM-Model states that the terrorism incidents cannot be examined with precision as their nature is irregular and uncertain.

To find the national terrorism vulnerability rate, the common formula to measure is as below.

There are three different levels of vulnerability rate to examine the terrorism vulnerability rate (μ_T) (see Eq. 3).

$$\mu_T = \left(Ln\sqrt{1-\beta}\right) \tag{3}$$

The first level is the high vulnerability rate whose value lies between 1 and 0.75. The second level is the average vulnerability rate which between 0.74 and 0.34 and third level is the low vulnerability rate with value from 0.33 to 0.

There are three types of relationship between national terrorism vulnerability rate (μ_T) and economic desgrowth. On one side, when the national terrorism vulnerability rate is very high the economic desgrowth will be high. On other side, when the terrorism vulnerability rate (μ_T) is low the economic desgrowth will also be low. The application of "The Dynamic Imbalanced State (DIS)", which is presented by Ruiz Estrada and Yap (2012) explains that it is dynamic and changes continuously.

The terrorism devastation magnitude (λ)

Capital devastation and human capital devastation are used as a variables to calculate terrorism devastation magnitude rate. The capital devastation magnitude rate is measured as the total number of incidence of terrorism and types of terrorist attacks in a certain area in a geographical locality divided by the total area of the same specific locality. The human capital devastation magnitude rate measures as the number of killing or missing persons in

a specific location divided by the total population of the same geographical locality. By multiplying both the results of capital and human capital devastation magnitude rate measure the value of terrorism devastation magnitude rate (λ).

$$\lambda = Ln[(\phi k) \times (\psi L)] \tag{4}$$

The economic desgrowth

The economic desgrowth is a novel concept and macroeconomic indicator that reveals the final impact of any natural hazards on the GNP. This elucidates that how final GNP-post violence hazards depend on the terrorism devastation magnitude rate (λ). Along with that, terrorism devastation magnitude rate (λ) is directly linked to the national terrorism vulnerability rate (μ_T). So the economic desgrowth is measured by the combination of the rates of product of terrorism devastation magnitude rate and national terrorism vulnerability rate. The general formula for the measurement of economic desgrowth is as below:

$$\delta = (\mu_T)(\lambda) \tag{5}$$

Equation (5) explains that the economic desgrowth value will be negative. The analysis scrutinizes that when both national vulnerability rate and terrorism devastation magnitude rate are moving upward, the economic desgrowth will also change in the same course (se expression 6).

$$\uparrow \delta = (\uparrow \mu_T)(\uparrow \lambda) \tag{6}$$

$$\downarrow \delta = (\downarrow \mu_T)(\downarrow \lambda) \tag{7}$$

Therefore, economic desgrowth is directly proportional to magnitude rate, national vulnerability rate, and terrorism devastation.

The terrorism vulnerability surface (VV-Surface)

The plotting of vulnerability surface (VV-Surface) depends on the mega-surface coordinate space and terrorism frequency rate (B). In this case of the research study, the VV- surface is plotted through three by four matrix (single value of all 12 variables). All the 12 variables of terrorism incidents and types of terrorist attacks values are plotted into four rows and three columns on the VV-Surface. The VV-Surface describes the visual representation of the terrorism incidents and types of terrorist attacks of any economy or country. The VV-Surface can be shown as bellow.

$$\eta = (\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}, \beta_{11}, \beta_{12}) \tag{8}$$

The VV-Surface depends on the divergence that happened due to any terrorism incident or any type of terrorist attack during a given time period.

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