Role of economic factors in terrorism in Pakistan

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Abstract This research paper analyzed the role of economic factors in terrorism in Pakistan empirically using the annual time series data, covering the period from 2001 to 2014. The stationarity of the variables was checked by applying the augmented Dicky–Fuller unit root test. The NLS and ARMA (least square regression) model have been used as analytical techniques. The results revealed that except poverty all other economic factors (unemployment, income inequality, GDP per capita, literacy rate, population density and inflation rate) included in the study show the positive and significant impact on terrorism in case of Pakistan. In the recommendations the study suggests that economic factors plays role in terrorism in Pakistan. Government should need to control these factors by giving possible and satisfactory solution.

Keywords Terrorism · Economic factors · Unit root test · NLS and ARMA model

1 Introduction

Pakistan since the independence is facing problems like political instability, budget deficit, high public debt, deficit financing, poverty, inequality, unemployment, high inflation, low Human Development Index (HDI), low and poor quality production, scarce resource to execute individual's demand, high military interference and immature democracy. But in

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spite of these problems, at the start of twenty first century after September 9, 2001, it has initiate facing a sever death killing, the uncontrollable and unstoppable problem the terrorism. This not only weakened Pakistan socially and politically but also broke the economic backbone of the country. It pushed the economic situation of a country back to more than 100 years, due to high loss of infrastructures, development and destroying all the economic sectors. It not only gave the economic loss, but also gave such type of losses that can't be recovered; that are the thrashing and hammering of the individuals caused by the terrorist activities and bomb blasts. The biggest trouncing is that the name of Pakistan became reproachful owing to these terrorist activities and most of the countries are looking at the eye of doubt to the peoples of Pakistan.

At the start of this century like many other important issues for the politicians, researchers and economists the most burning is that of terrorism. Terrorism has taken rapid attention and became the core issue after the attack the World Trade Centre in the United States of America (U.S) on 9/11, 2001 by terrorist killing more than three thousand people. After that many researchers and scholars worked on the theme of terrorism but abortive in giving common definition. Simply, it can be said that "terrorism is an attempt or threat or plane of a huge destruction, killing and violence", (Sandler and Enders 2000).

Now-a-days terrorism is the hottest and debating concern in the world and every country is aware of the danger of terrorism. The national security policy becomes the core issue as the most of the world nation feels high threat from terrorism. That's why most of the countries have reviewed their national security and foreign policies making them sticker by taking a number of measurement steps to protect their nations and national's from terrorism. They not only follow the strict system of checking on the entry and exit points at the airport but also make more tight rules and regulation for visas. These policies are successful in the short run but may not be very successful in the long run to control and get rid from terrorism and its threat. That's why there is need for the researcher and policy maker to goes beyond from traditional methods, find the root cause of terrorism and then attempt to solve and get purge from this bloodshed premise.

Up till now a lot of research studies premeditated the terrorism from different angles. Some researchers tried to find the political cause of terrorism, the economic cause, the social and injustice etc. As the researcher worked from different dimension due to which the causes, factors, finding, conclusion, policy recommendation and remedial measures are also different from study to study. It is also a fact that terrorism is not the annoyance of single phenomenon, but it has caused by multi-dimensional phenomenon, which not only make it more complicated but also make it more complex and multifaceted for the researcher. In addition, it also became very challenging for the researcher to stumble on the true and exact cause of terrorism and its remedial measure.

The cause and facts of terrorism varies from region to region. South Asia is the most important and popular region of the world. This region consist of eight main countries including; Pakistan, Afghanistan, Sri Lanka, Bangladesh, Maldives, Nepal, Bhutan and India. There is close similarities of culture and tradition while ethnic and religion dissimilarities exists between the countries in this region. South Asia is the most effected region of terrorism and in truly speaking the terrorism is in the peak in this region from several years. That's why this region now takes the pose of a central eye as a terrorism affected region. It has faced and still facing many kinds of terrorist activities and rising of activist groups raising many questions about the terrorism policies and anti-terrorism function and abilities.

The U.S attack on Afghanistan as a reaction of 9/11 attack, not only created instability and conflict in Afghanistan but also affected severely Pakistan economically, socially and morally. The instability and war in Afghanistan constrains the people of Afghanistan on migration towards Pakistan creating a lot of burden on its economy. Being a developing country and slow economic growth, it's very hard for Pakistan to handle it. Second, as an alloy of U.S in the war of terrorism the terrorist group started terrorist attacks in Pakistan. In the war on terror Pakistan has lost more than 35,000 lives from 2001 to 2011 [*Source* Economic Survey of Pakistan (2011) and Global Terrorism Database (2013)] and more than 1.5 million people living as internal displaced people (IDP's). These problems became the mainstream for the distraction of economic growth and development from the normal position and pushed rear the performance of all economic sectors causing negative economic growth of Pakistan.

This research paper is probing "the role of economic factors in terrorism for Pakistan". As Pakistan is the most affected country of terrorism but it is playing a crucial role against the terrorism and for its sovereignty. The terrorist groups attack on every sector and places including markets, functions, election campaigns, political and religious leaders, religious places and education institution even on the children's school too. They are using the latest armaments amid unreliable motives with to sweep over or surround a wider part of the region claiming more deaths. In Pakistan's terrorism has engrossed a sizeable attention on the global and local level too. That's why many researchers have worked on the basic causes of terrorism in Pakistan; Jihad Culture in Pakistan (Stern 2000); Pakistan's sectarian terrorism and violence, sunni-shi (Grare 2007); state-own terrorism sponsor by Pakistan (Williams 2008); The making of terrorism in Pakistan (Murphy 2013); Culture of Madras's in Pakistan (Schaffer 2008); performance of Pakistan as an ally of U.S. in war against terrorism (Tellis 2008); The Sectarian conflicts and evolution of terrorism (Frederic 2007) and etc. All these researches are done from different angles and no comprehensive studies were conducted yet. Due to this it is not been possible to find the main and exact cause of terrorism, policy for its control, develop a counter terrorism force and operational planning.

1.1 Objective of the research study

The main objective of this research paper is to find out "the role of economic factors in terrorism". There are many factors like social, political, motivated and even frustration and self-exploitation factors which played a lot of role in the terrorism. In this paper we tried to find only the economic factors.

After the incidence of 9/11, due to the start of terrorism and terrorist attacks, the economic growth of Pakistan had became awfully sluggish. Most the economic sectors and infrastructures suffered leads to increase in foreign loans and budget deficit. The country faces high rate of inflation, unemployment and income inequality. Due the threats and insecurity the foreign investment decreases and the country failed to attract new investment from foreign and domestic too.

2 A brief description of the effects of terrorism on Pakistan

This section briefly describe the losses, effects and outcome of the war of terror that faces and incurred to the economy, bearded by people and overall image and position on Pakistan.

2.1 The estimated cost and losses of economic sectors and institutions of Pakistan due to terrorism

The Finance Minister of Pakistan constituted the committee included several financial experts as member to review and examine the loss and crash caused from the attacks of the terrorism to the economy and development of Pakistan. The committee critically analyzed all the incidents and submits the reports on the estimated monetary losses occurred in different economic sectors; reduction in the exports, foreign direct investment, minimization in Industrial goods and output, tax collection, destruction of infrastructure, Schools, Hospitals, energy sector etc. due to terrorist activities in Pakistan. The summary of these estimated are given in below Table 1.

In the war of terrorism Pakistan has lost many of its important and keen economic sectors, infrastructure and resources. In order to rebuild Pakistan to its back position prior to 9/11, 2001, needs huge and massive resources, improved in the production capacity, rebuilding and structuring of infrastructure, heavy capital and manufacturing sector, high national saving and revenue, capturing of foreign investment, minimizing the uncertainty and risk and the most important to get control over the terrorist activities and groups.

Pakistan had paid a heavy price of terrorism both the direct and indirect cost. A short summary of these incurred cost from September, 2001 to March 2014 are given in the below Table 2.

The above table (Tables 1, 2) and graphs (Figs. 1, 2) shows the estimated direct and indirect cost incurred in Pakistan due to terrorism from 2001 to 2014. It is clear from the graph that the year 2010–2011 was the worse year for Pakistan bearing the terrorism cost about Rs. 2037.33 billion or US $23.77 billion.

Table 1 Summary of the estimated cost and losses in Terrorism (in US$ million)

Economic sectors and institutions	Years			Total
	2011–2012	2012–2013	2013–2014	
Exports of embodied goods	1237.0	730.0	323.13	2290.13
Compensation to affects' areas	24.28	20.96	13.97	59.21
Damages of physical infrastructure	1266.18	766.99	437.36	2470.53
Foreign investments	4597.0	210.0	3260.0	8067.0
Privatization commission	277.0	4719.46	0.0	4996.46
Industrial production and output	331.69	308.49	129.61	769.79
Tax collection and revenue	2431.76	2315.79	1732.39	6479.94
Cost of uncertainty	121.83	50.34	32.61	204.78
Expenditure over running cost	111.96	324.58	207.98	644.52
Others cost and losses	1398.88	522.0	556.65	2477.53
Total estimate of losses	11,797.58	9968.61	6693.70	28,459.89

Source Economic Survey of Pakistan 2013–2014

Cost in Rs. Billion

Fig. 1 Cost of war of terrorism (2001–2014) in Rs. in billions. *Source* Authors drawn in Ms-Excel from the data given in Table 2

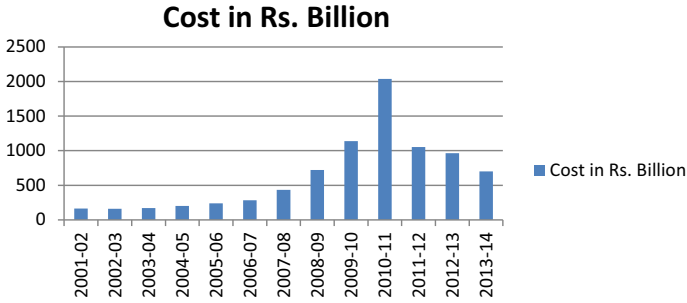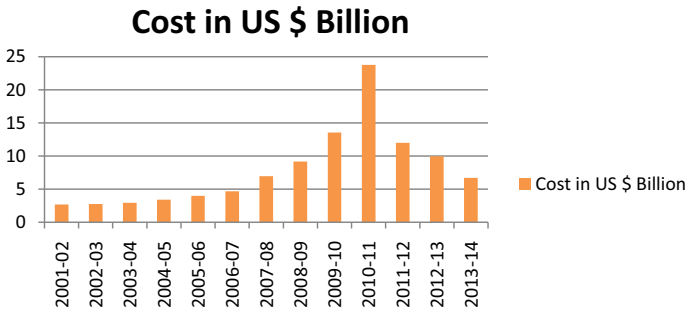## Cost in US $ Billion

Fig. 2 Cost of war of terrorism (2001–2014) in US$ in billions. *Source* Authors drawn in Ms-Excel from the data given in Table 2

Table 2 Cost of war of terrorism (2001–2014)

Years	Cost in Rs. billion	Percentage change	Cost in US$ billion
2001–2002	163.90	–	2.67
2002–2003	160.80	−3.1	2.75
2003–2004	168.80	6.7	2.93
2004–2005	202.40	16.3	3.41
2005–2006	238.60	16.9	3.99
2006–2007	283.20	17.2	4.67
2007–2008	434.10	48.6	6.94
2008–2009	720.60	32.3	9.18
2009–2010	1136.40	47.7	13.56
2010–2011	2037.33	75.3	23.77
2011–2012	1052.77	−49.6	11.98
2012–2013	964.24	−16.8	9.97
2013–2014	701.26	−32.9	6.69
Total	8264.40		102.51

Source Economic Survey of Pakistan 2013–2014

2.2 Comperative analysis of the world most effected countries of terrorism from 1970 to 2013

This section is philanthropic the comparative analysis of the top ten most affected countries of the world from terrorism. Although the word "terrorism" is not new for the world and it is fact that this word is new for Pakistan and south Asia. It is also important to mention that this global issue gain its boom and became the centre part issue for the researcher after 9/11 2001. The below Tables 3 and 4 shows the top ten countries regarding the terrorist attacks and causalities in terrorist incidence from 1986 to 2001.

The above tables show the number of top ten countries terrorist attacks and causalities occurred in the world countries from 1986 to 2001. Here our main concern country is Pakistan. Table 3 shows that the number of terrorist attacks or incidence occurred in Pakistan from 1986 to 2001 are 40 and it is the 9th ranking country of the world. If examine at Table 4 though these attacks are not good for the country but still it didn't damage the country nor do most of the causalities. It is clear from the table that Pakistan is

Table 3 Top Ten world ranking countries concerning no. of terrorist incidence/attacks from 1986 to 2001

Rank	Country	No. of terrorist incidence/attacks	Average per capita GDP	HDI index	HDI remarks
01	India	237	$2358	115	Medium
02	Colombia	129	5615	62	Medium
03	Yemen	59	1608	133	Low
04	Turkey	56	5805	82	Medium
05	Greece	48	11,862	23	High
06	Israel	48	12,651	49	High
07	Angola	45	2510	146	Low
08	Peru	45	4622	73	Medium
09	Pakistan	40	1928	138	Low
10	France	39	22,897	13	High

Source Global Terrorism Database (2003)

Table 4 Top ten world ranking countries concerning no. of casualties in terrorist incidence/attacks from 1986 to 2001

Rank	Country	Casualties in terrorist incidence/attacks	Average per capita GDP	HDI index	HDI remarks
01	Kenya	5365	$1211	123	Medium
02	United States	4011	$27,816	6	High
03	India	2779	$358	115	Medium
04	Israel	2257	$12,651	49	High
05	Sri Lanka	1815	$3365	81	Medium
06	Iraq	1646	$3413	106	Medium
07	Russian Federation	1314	$8377	60	Medium
08	Saudi Arabia	1037	$10,348	68	Medium
09	United Kingdom	984	$19,627	14	High
10	Colombia	835	$5615	62	Medium

Source Global Terrorism Database (2003)

Table 5 No. of terrorist incidence in terrorism effected countries in 2012 and 2013

Rank	In the year 2012		Rank	In the year 2013	
	Country	Total attacks		Country	Total attacks
01	Pakistan	1404	01	Iraq	2495
02	Iraq	1271	02	Pakistan	1920
03	Afghanistan	1023	03	Afghanistan	1144
04	India	557	04	India	622
05	Nigeria	546	05	Thailand	332
06	Thailand	222	06	Nigeria	300
07	Yemen	203	07	Yemen	295
08	Somalia	185	08	Syria	212
09	Philippine	141	09	Somalia	185
10	Syria	133	10	Philippine	141

Source Global Terrorism Database (2014)

Table 6 Top ten world ranking terrorism effected countries from 2002 to 2014

Rank	Country (2002)	Country (2010)	Country (2014)
01	Iraq	Iraq	Iraq
02	Pakistan	Pakistan	Afghanistan
03	Afghanistan	Afghanistan	Pakistan
04	India	India	Nigeria
05	Yemen	Thailand	Syria
06	Somalia	Somalia	India
07	Nigeria	Russia	Somalia
08	Thailand	Philippine	Yemen
09	Russia	Yemen	Philippine
10	Philippine	Democratic Republic	Thailand

Source Global Terrorism Database (2014)

not in the list of the top ten causalities (death, injured) affected countries. But if you compare the most affected countries of the world from the era after the incidence of 9/11, Pakistan is in the most effected countries of terrorism after became an alloy of US in the war of terrorism. Below Table 5 shows some statistics of the top ten terrorism incidence or attacks affected countries.

The above table shows that in 2012 Pakistan had faced the highest terrorist attacks killing more than 1848 people and about 3643 injuries and causalities. In Iraq the total number of incidence were 1271, killing 2436 individuals and 6641 injuries, while in Afghanistan 1023 attacks cause the killing of 2632 people and more than 3715 injuries and causalities [*Source* Global Terrorism Database (2014)]. The Table 6 give a brief summary of the top ten terrorism effected countries from 2002 to 2014.

The above ranking of the countries showed that on average Pakistan is the second most effected country of the terrorism from 2002 to 2011. In 2014 it get some sort of better in comes to position 3 but still high effected country. These all statistics shows that Pakistan had paid a huge price in the war of terrorism.

3 Literature review

This section review some past literature linking terrorism with different variables and factors. A vast literature exits about the terrorism, but in the present, the literature relevant to some economic factors, education and some other general factors. However there is very rare and limited work on the terrorism with the economic side especially in case of Pakistan.

Gurr (1970) worked on the poverty, inequality and terrorism and has work is considered the most important and pioneer work in terrorism. He derived the phenomenon of "relative deprivation". This phenomenon linked poverty and inequality with terrorism and violence. He found that these economic variables and unequal distribution of economic variables produces stress and frustration among the individuals and in societies which leads to terrorism.

Thompson (1989) examined the impact of unemployment on terrorism for Northern Ireland using time series data. His study results revealed that unemployment and terrorism had connected in indirect way not through directly. Thomson didn't include the impact of education on unemployment and on terrorism.

Li and Schuab (2004) tested the role of globalization in international terrorism. They used the pooled time series data covering the period of analysis from 1975 to 1997, taking the sample of 112 countries. They want to test the hypothesis that international trade results increased in the terrorism by providing easy access to the terrorist groups entering to any country. The study found that trade openness and globalization significantly reduce the terrorist attacks with in the country.

Piazza (2006) empirically investigated the impact of economic factors (unemployment, poverty, inflation, income inequality and low economic growth) on terrorism. He took the time series data of 96 countries covering the period from 1986 to 2002. The study found that these economic factors played the role of root cause in terrorism. Further, concluded that increase in population, different ethnic and religious group, increased state oppression and subjugation also leads to terrorism.

Blomberg and Gregory (2008) empirically analyzed that economic development is one of the most key element of terrorism. They stressed that economic development and terrorism has strongly correlated in high income countries and weakly correlated with lower income countries. Further, they found that some non-economic factor variables, political and ideological thoughts and motivation also have strong influence on terrorism.

Some of the researchers worked on other dimension of terrorism too except economic factors. Krueger and Maleckova (2003) assessed the role of secondary education and poverty in terrorism. They argued that these variables changes the feelings of the individuals dubiously and smooth the mode of violence to approach towards terrorism. Azam and Thelen (2008) found that majority of the terrorist groups individuals have ages of twenties. These peoples also have obtained some technical education, trainings and either secondary education. Sageman (2004) exposed that the most popular terrorist group Al-Qaeeda contains the individuals having highest level of education included Engineers, Doctors, professionals and technical skills person. Mesquita (2005) explored that the terrorist groups hired the high educated and wealthier people for the terrorist activities rather than poor and less educated. Azam and Thelen (2008) examined the role education and foreign aid in terrorism and found that found that these variables have negative correlation with terrorism.

Some researchers also linked the role of education and some economic variables with terrorism. Angrist (1995) determined the role of education and unemployment in terrorism for Israel and Palestine. The author found that unemployment after high education create stressed and frustrations that leads to increase in terrorist attacks especially in Palestine in 1987.

Krueger and Maleckova (2003) assessed the causal relationship between poverty, education and terrorism. They found that most of the terrorist in Palestine have high education and wealthier. They also concluded majority people of the terrorist group "Hezbollah" are educated and not poor. Their results obtained from the study showed that education has positively related with terrorism showing the significant causal relationship between education and terrorism. The study also showed the inverse relationship between poverty and terrorism. Berrebi (2007) explores the work of Kruger and Jitka by adding standard of living an extra variable and found the same results. Johan and Galtung (2005) analyzed that high education and low salaries leads to frustration and ultimately to terrorism.

Pakistan is playing a central role in terrorism and borne the highest economic lost in the war of terrorism (as mentioned in Tables 1, 2). There are some studies done on the terrorism in Pakistan with different dimension and literature, but none of the study significant study was found on the role of economic factors on Pakistan. That's why the author chooses to study that either economic factors have any role in the terrorism of Pakistan.

4 Data and model

4.1 Description of data

The annual time series data are used in this research paper covering the period from 2001 to 2014, to examine the role of economic factors in terrorism for Pakistan. The time period for study Selected from 2001, for the reason that at that year the terrorism started in boom in Pakistan. There is no direct source from which the data for all the variables included in this study are available. Therefore, the data has obtained from different sources.

The main sources from which data are obtained include Global Terrorism Database, Regional Base Information on Terrorism, Economic Survey of Pakistan, World Development Index, World Bank, Trading Economics, World Economic data Indicator, Ministry of Finance and Economic Affairs Pakistan and State Bank of Pakistan.

4.2 Model specification and background

In this research paper the terrorist activity model develop (Wintrobe 2006), which incorporate the combine decision of individual's terrorist or agent's and terrorist group leader. The basic objective of the terrorist individuals is to obtain positive utility and secondary to prove their harmony to the terrorist group. Thus the Wintrobe model derives an optimal level of utility from the trade-off between consumption of goods and terrorism for the individual's terrorist and terrorist group leader.

Pittle and Rubbelke (2006) developed the model for the terrorism from the extension of the Wintrobe model that explains the basics and grounds for the motivation towards terrorism. They proposed that terrorist support is an impure public good for the individual's terrorist. The utility function of the individual agent is from i = 1, 2, 3,…, n, derived from the terrorist group support "Si" and consumption of private goods "Ci". The terrorist group also derivative of utility by producing the public characteristics "g_i" and private characteristics "P_i" from their individuals support "Si".

$$U_i(C_i, T_i) = U_i(C_i, P_i, g_i) \tag{1a}$$

$$U_x^i = \frac{\partial U^i}{\partial x} > 0, \quad U_{xx}^i < 0, \quad x = c_i, p_i, g_i \tag{1b}$$

The terrorist group support can be exogenously expressed as

$$p_i = \alpha t_i \quad \& \quad g_i = \beta t_i$$

Here $\beta > 0$ and $0 \le \alpha < 1$.

Now, the utility maximization equation of the terrorist leader, perceived from the individual's terrorist or agent's are as follows.

$$U_{pl} = U_{pl}(g_i) \tag{2a}$$

$$U_g^{pl} = \frac{\partial U^i}{\partial g} > 0, \quad U_{gg}^i < 0, \tag{2b}$$

So, the welfare utility equation of both the individual's terrorist and the group leader is

$$W_i(U_i, U_{pl}) = a_1 U_{pl}(g_i) + a_2 U_i(c_i, p_i, g_i) \tag{3}$$

Here, a_1 and a_2 are the weighted average of sub-utility obtains by the individuals terrorist and terrorist group leader from the utility function. Now, we assume the true utility function for the terrorist group leader, that is

$$U_{pli} = U_{pl}(c_i, g_i) \tag{4a}$$

The comparative statistics of the obtained utility function for the maximization is

$$U_{pli} = \frac{\partial U^i}{\partial c} > 0, \quad U_{cc}^i < 0, \tag{4b}$$

$$U_{pli} = \frac{\partial U^i}{\partial g} > 0, \quad U_{gg}^i < 0, \tag{4c}$$

The Eq. 4b and 4c gave the maximum utility function of the terrorist group leader from the given consumption bundle of goods and public characteristics. Here we assume that the terrorist group leader spent his received income on the consumption of goods and also on some instrumentals variables "θ and ∂"

$$Ipl = (C_l + Z_\theta \theta + Z_\partial \partial) \tag{5}$$

Here Z_θ and Z_∂ shows the cost of "θ and ∂" the terrorist group leader investing on the individuals terrorist agent's.

The terrorist groups or organizations are the collective group of different individuals aiming to maximize their utility from the terrorist attacks, violence and destructions. There are many causes and reason of the terrorism, as instrumental variable (s) "θ and ∂" in Eq. (5). In this research paper we examine the economic variables assuming that these variables play the role in terrorism. The regression model of our research paper as derived from Eq. (5) is:

$$Ti = \beta_0 + \beta_1 Pov + \beta_2 Unp + \beta_3 Ine + \beta_4 GDPPC + \beta_5 Lit + \beta_6 Pop + \beta_7 Inf + Ui$$

where Ti is the total no. of terrorist attacks/incidence, Pov is the poverty, Unp is the unemployment, Ine is the income inequality, $GDPPC$ is the GDP per capita, Lit is the literacy rate, Pop is the population density, Inf is the inflation rate, U_i is the error term.

5 Results and interpretations

It has been observed that a suspicion mostly vestiges in time-series analysis which creates[1] spurious relationship. As this research study is also based on time-series data, therefore before estimating the model the variables are check for the stationarity of data using the ADF unit root test. The results of the ADF test are shown in the Table 7.

The results in the Table 7 indicating that the variables are stationary at level.The paramount estimate preferred for testing significance of stationarity in the data augmented Dickey Fuller value and critical value (ADF) at 5 % of the estimator and the results are given in Table 7.

The variables included in the terrorist model are regressed through NLS and ARMA (Least Square Regression) model with the help of econometric software E-Views. The results of the regression analysis are given in Table 8.

The results showed that overall model is good (Prob. F-stat. 0.01 and the value of F-stat. is about 52). The value of R^2 is 99 explaining more than 95 % variation between the dependent and the explanatory variables. The Durbin-Watson value is 2.33, near to the desired value showing very negligible sum of autocorrelation. All the explanatory variables are significant at different level of significance (1, 5 and 10 %) having true expected sign except poverty.

Poverty has significant at 5 % but having negative sign. It is unexpected and surprisingly that increase in poverty didn't have any influence in terrorism in case of Pakistan. However, the same results were found by Abadie (2005) and Piazza (2006). Krueger and Maleckova (2003)analyzed that most of the terrorist groups and individuals are wealthier and not poor.

The income inequality is the most significant variable having positive sign showing the positive and premier impact on terrorism. It means that increase in income inequality will bring the repression and "relative deprivation" in the individuals and the society and create motivation towards terrorism. The results are corresponding with the finding of Gurr (1970), who gave the main idea of the relative deprivation and worked on the causal relation between income inequality and terrorism. The results of income inequality of our study are also consistent with the work and findings of Muller and Seligson (1990) and London and Robinson (1989).

The per capita GDP is significant at 10 % with true expected sign. It explains that a decrease in the per capita income will cause increase in terrorism and vice versa. The results are same with that of the Testas (2004) and Muller and Weede (1990).

The unemployment and inflation are also significant having positive signs. These two variables are the most important variables as both decrease the purchasing power of the individuals when inflation and unemployment increases. This results in lowering the utility of the individual's causing an increase in terrorism.

The other important variable is the literacy rate. In our study results the coefficient of literacy is positive and significant, means that increase in literacy cause increase in

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[1] DW $<$ R^2 shows the spurus relation in the data. But in this research study DW $>$ R^2 Value as shown in Table 7.

Table 7 The ADF unit root test results for the stationarity of data at level

Variables	Abbreviations	Augmented Dickey Fuller	Critical value (ADF)
Terroist attacks	Ti	−3.230681	−3.1801
Poverty	Pov	−3.424499	−3.1801
Unemployment	Un	−3.516355	−3.1801
Income inequality	Ine	−3.344871	−3.1801
GDP per capita	GDPPC	−3.220715	−3.1801
Literacy rate	Lit	−3.337409	−3.1801
Population density	Pop	−3.193119	−3.1801
Inflation	Inf	−3.910771	−3.1801

Critical value are selected at 5 % significance level

Table 8 Regression results of terrorist attacks as dependent variable are

Variables	Abbreviations	Coefficient	SE	t-Statistic	Prob.
Constant	C	3.217645	0.657692	4.736990	0.0418
Poverty	Pov	−1.224606	0.271242	−4.514893	0.0457
Unemployment	Un	4.478569	1.468025	3.050744	0.0927
Income inequality	Ine	6.201155	0.774654	8.005050	0.0152
GDP per capita	GDPPC	0.834585	0.274933	3.035595	0.0935
Literacy rate	Lit	4.174994	1.102312	3.787479	0.0632
Population density	Pop	0.722150	0.143604	5.028747	0.0373
Inflation	Inf	4.294132	1.274168	3.370146	0.0779
R-squared	0.994584	F-statistic	52.46350	Durbin–Watson stat	2.339990
Adjusted R-squared	0.975626	Prob(F-statistic)	0.018830		

terrorism. The most researchers have the same findings that terrorist groups have high and technical educated persons. The result of our study for literacy is consistent with Krueger and Maleckova (2003), Azam and Thelen (2008), Sageman (2004) and Mesquita (2005). Here to mention that a recent terrorist attack that occurs in Karachi (Pakistan), in which the terrorist group target the passenger in a bus killing more than 43 men's and woman's. The interesting thing is that the three suspected terrorist arrested involved in it are highly educated and from reputable universities.

The last variable included in the study is the population density. The coefficient of the estimator population density is too significant having positive sign showing the direct impact on the terrorism. It means that increase in population can increase the ratio of the individuals to join terrorist groups resulting more terrorist attacks and violence.

6 Conclusion and recommendations

The findings of this research study shows that economic factors (unemployment, income inequality, inflation and GDP per capita) play a significant role in terrorism of Pakistan except poverty. In addition, the literacy rate, unemployment and inflation are linked with each other and are the major issues in the developing countries including Pakistan. These

factors have positive and significant effect on terrorism in Pakistan. Government should provide employment opportunities and control the inflation in the country especially basic items and for food items. Government should also keep a check on the syllabus and education taught in the schools, madras's and in universities.

The population density has positive effect on the terrorism in Pakistan which should be controlled as the population of Pakistan is growing at a faster rate. The income inequality is at the peak in Pakistan as showing by Gini Coefficient and playing a major effect on the terrorism. Government should need to ensure the proper allocation of resources and income among the individual's of a country and to reduce the income inequality in the country. This will gave get rid of the "relative deprivation" to the people living in the society.

It is also analyzed during the study that some other factors are having main contribution in the terrorism of Pakistan. These are political factors, ethical factors, sectarian's factors, injustice, foreign interference, drone attacks, misuse of the motivation and exploitation etc. the government of Pakistan should need to focus on these issues and to get proper handle of the solution of these problems.

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