ECONOMIC CAUSES AND CONSEQUENCES OF TERRORISM: A STUDY OF FOUR ISLAMIC COUNTRIES

ALAM KHAN

FACULTY OF ECONOMICS AND ADMINISTRATION
UNIVERSITY OF MALAYA
KUALA LUMPUR

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ABSTRACT

Terrorism, which has substantially affected economic performance since the start of the new millennium, is a global economic challenge. The Global Terrorism Index (GTI) (2015) reports that terrorism intensity has been concentrated inside Middle East and North Africa (MENA) and Asian economies. Remarkably, only five countries (Afghanistan, Pakistan, Syria, Iraq and Nigeria) account for 78% of deaths due to terrorism. This research develops and applies alternative indicators to examine the economic causes and consequences of terrorism in four Islamic countries, and has four main objectives. First, it investigates the measurement of terrorism at the province level by introducing the Terrorist Economic Impact Evaluation (TEIE) indicator. Second, it examines the poverty and terrorism relationship by extending the TEIE indicator, and it links to the poverty variable at the province level by developing the Poverty Terrorist Evaluation Measurement (PTEM) indicator. Third, it analyzes the trade-terrorism nexus by developing an index of Trade-Terrorist Evaluation Index (TTEI). And fourth, it evaluates the effects of terrorism on economic performance through the Terrorist Attack Vulnerability Evaluation (TAVE) indicator. The findings of the TEIE indicator suggest that terrorism intensity varies across geographical location and time in the case of Islamic countries. The results of TEIE also confirm that geographical dimensions of terrorism matter within a particular economy. Different provinces have different levels and magnitudes of intensity as confirmed from the application of the TEIE indicator. The PTEM indicator is based on the hypothesis that high poverty can generate terrorism. The findings of the PTEM technique on the economy of Pakistan at the provincial level reveal that poverty is the root cause of terrorism. Results of the PTEM technique are also supported by the econometric techniques. The econometric results also support the hypothesis of the PTEM technique and confirm that poverty and terrorism have a long-run and significant relationship. Results of TTEI suggest that terrorism affects

international trade in the case of Islamic economies, and these TTEI results are supported by the econometric technique panel autoregressive distributed lag (ARDL) model. The results of the TAVE indicator show that if the real gross domestic product (GDP) growth rate is small, then the total economic leaking caused by an attack always affects economic performance. The economy also experiences a permanent economic desgrowth. On the contrary, if the real GDP growth rate is high, then the total economic leaking caused by a terrorist attack has a limited effect in the beginning stage. Total economic leaking causes economic desgrowth only at a later stage. The application of the TAVE indicator to the Islamic countries demonstrates that economic leakages in the form of economic desgrowth are generated from the economic growth rate caused by terrorism in the case of these Muslim economies. The econometric model results also support those of the TAVE results, and confirm that terrorism has a negative and significant effect on the economic performance of Islamic countries. This study concludes that terrorism can be a cause and consequence in itself.

ABSTRAK

Keganasan, yang telah menjejaskan prestasi ekonomi secara ketara sejak permulaan alaf baru, adalah satu cabaran ekonomi global. Indeks Keganasan Global (GTI) (2015) melaporkan bahawa intensiti keganasan telah tertumpu dalam ekonomi-ekonomi Timur Tengah dan Afrika Utara (MENA), dan Asia. Yang luar biasa, hanya lima negara (Afghanistan, Pakistan, Syria, Iraq dan Nigeria) menyumbangkan 78% daripada kematian akibat keganasan. Kajian ini membentuk dan menggunakan petunjuk alternatif untuk mengkaji kesan keganasan atas ekonomi di negara-negara Islam, serta mempunyai empat objektif utama. Pertama, ia menyiasat ukuran keganasan di peringkat negeri/wilayah dengan memperkenalkan penunjuk TEIE (Penilaian Impak Ekonomi Pengganas). Kedua, ia mengkaji hubungan antara kemiskinan dan keganasan dengan melanjutkan penunjuk TEIE, dan ia menghubungkan kepada pembolehubah kemiskinan di peringkat negeri dengan membentuk penunjuk PTEM (Ukuran Penilaian Kemiskinan Pengganas). Ketiga, ia menganalisis pertalian perdagangan-keganasan dengan membentuk indeks TTEI (Indeks Penilaian Perdagangan-Pengganas). Dan keempat, ia menilai kesan keganasan terhadap prestasi ekonomi melalui penunjuk TAVE (Penilaian Keterdedahan Serangan Pengganas). Hasil teknik TEIE mencadangkan bahawa intensiti keganasan berbeza mengikut lokasi geografi dan masa dalam kes negara-negara Islam. Keputusan TEIE juga mengesahkan bahawa dimensi geografi untuk keganasan berbeza antara ekonomi tertentu. Negeri/wilayah yang berbeza mempunyai tahap dan magnitude intensiti yang berbeza seperti yang disahkan daripada aplikasi penunjuk TEIE itu. Teknik PTEM adalah berdasarkan hipotesis bahawa kemiskinan yang tinggi boleh menjana keganasan. Hasil teknik PTEM tentang ekonomi Pakistan di peringkat wilayah mendedahkan bahawa kemiskinan adalah punca keganasan. Keputusan teknik PTEM juga disokong oleh teknik ekonometrik. Keputusan ekonometrik menyokong hipotesis teknik PTEM dan mengesahkan bahawa kemiskinan dan keganasan mempunyai hubungan yang jangka

panjang dan signifikan. Keputusan TTEI mencadangkan bahawa keganasan memberi kesan kepada perdagangan antarabangsa dalam kes ekonomi-ekonomi Islam, dan keputusan TTEI ini disokong oleh teknik ekonometrik model panel lag autoregresif diedarkan (*panel autoregressive distributed lag*, ARDL). Keputusan penunjuk TAVE menunjukkan bahawa jika kadar pertumbuhan Keluaran Dalam Negara Kasar (KDNK) benar adalah kecil, maka jumlah ketirisan ekonomi yang disebabkan oleh serangan sentiasa memberi kesan kepada prestasi ekonomi. Ekonomi negara juga mengalami desgrowth ekonomi yang kekal. Sebaliknya, jika kadar pertumbuhan KDNK sebenar adalah tinggi, maka jumlah ketirisan ekonomi yang disebabkan oleh serangan pengganas mempunyai kesan terhad pada peringkat awal. Jumlah ketirisan ekonomi yang menyebabkan desgrowth ekonomi hanya berlaku pada peringkat yang seterusnya. Penggunaan penunjuk TAVE atas negara-negara Islam menunjukkan bahawa ketirisan ekonomi dalam bentuk desgrowth ekonomi dijanakan daripada kadar pertumbuhan ekonomi yang disebabkan oleh keganasan dalam kes ekonomi-ekonomi Islam. Keputusan model ekonometrik juga menyokong keputusan TAVE, dan mengesahkan keganasan mempunyai kesan negatif dan signifikan kepada prestasi ekonomi negara-negara Islam. Kajian ini menyimpulkan bahawa keganasan boleh menjadi punca dan akibat.

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LIST OF SYMBOLS AND ABBREVIATIONS

ARDL	:	Auto Regressive Distributed Lag
FMOLS	:	Fully Modified Ordinary Least Square
GTD	:	Global Terrorism Database
GTI	:	Global Terrorism Index
IEP	:	Institute of Economics and Peace
ISIS	:	Islamic State in Iraq and Syria
N	:	Population
Np	:	Number of Poor People
POV	:	Poverty
PTEM	:	Poverty Terrorist Evaluation Measurement
TAVE	:	Terrorist Attack Vulnerability Evaluation
TEIE	:	Terrorist Economic Impact Evaluation
TR	:	Terrorism
TRI	:	Terrorism Intensity
TTEI	:	Trade–Terrorist Evaluation Index
TO	:	Trade Openness
Ω_T	:	Economic Leaking
Π	:	Economic Wear
χ	:	Number of Injuries
κ	:	Number of Killed
ε	:	Terrorist Incidents
$\Re$	:	Terrorist Attack Action
ζ	:	Terrorist Attack Tension

δ	:	Economic Desgrowth
P1	:	Player 1 (Government)
P2	:	Player 2 (Domestic Terrorist Group)
P3	:	Player 3 (Other Supporting Government)
P4	:	Player 4 (International Terrorist Group)
μ	:	Capital Damage
Ω	:	Terrorism Evaluation Measurement

CHAPTER 1: INTRODUCTION

1.1 Background

Terrorism is a concept that has received the attention of academics after the catastrophic 9/11 terrorist attack in the United States. Terrorism is a multi-dimensional term, which is commonly observed in historical, sociological, psychological, political, or geopolitical contexts. However, acts of terrorism can have extensive economic impacts. Terrorism has economic consequences and economic causes. The underlying drivers of terrorism are multidimensional, extending from religious fanaticism to a feeling of estrangement from society to outrage at the geopolitical apparent prejudice. However, economic aspects can support the rise of terrorism. Poor economic performance can generate lesser employment and other economic opportunities for the general public and ultimately poverty triumphs over the economy. The surge in the level of poverty provides the ground for terrorist groups to recruit the people living in miserable condition in the society. The absence of economic opportunities can be an influential factor of terrorism, particularly in juxtaposition with other factors such as social and political dynamics.

Terrorism is a global phenomenon, that is, terrorist attacks (e.g., the terrorist attacks in France, Denmark and Turkey in November 2015, and in Indonesia in January 2016) can take place anywhere in the world at any given time. Furthermore, the number of terrorist activities in the Middle East and Asian countries has increased over the years. The most terrible situation can be observed in the cases of Iraq and Syria, especially because the flow of foreign fighters into these countries continue to increase. Since 2011, between 25,000 and 30,000 fighters from more than 100 different countries have penetrated the Iraqi and Syrian territories. In fact, the number of international terrorists continues to increase, with estimates suggesting that over 7,000 new recruits arrived in these countries in the first half of 2015 alone. These figures suggest that the attraction of these jihadist groups among potential recruits is still strong. Europeans comprise 21 percent of all

foreign fighters, while 50 percent come from neighboring Middle-Eastern and North African (MENA) countries. This flow of terrorists from all over the world into Syria and Iraq represents not only an alarming situation that poses security threats to these two economies, but also constitutes future threats to the host economy upon the return of these fighters to their home countries. This is the current condition leading to the globalization of the threat of ISIS' violent extremism [Global Terrorism Index (GTI), 2015 & 2016] (see Figure 1.1).

Previous studies have provided various conceptions of the term "terrorism." For example, Crenshaw (1981) believes that terrorism arises in the context of violent resistance against a state/country and against the interests pursued by that state/country. Nevertheless, this can change depending on the interests of the small, violent groups carrying out the acts of terrorism. The terrorists' objectives may come in several forms: to fight for a separate state; to bring about changes in the legitimate social, economic, and political rights of an economy; to implement an extreme and specific religious doctrine; and as a form of foreign funded intervention in a neighboring country.

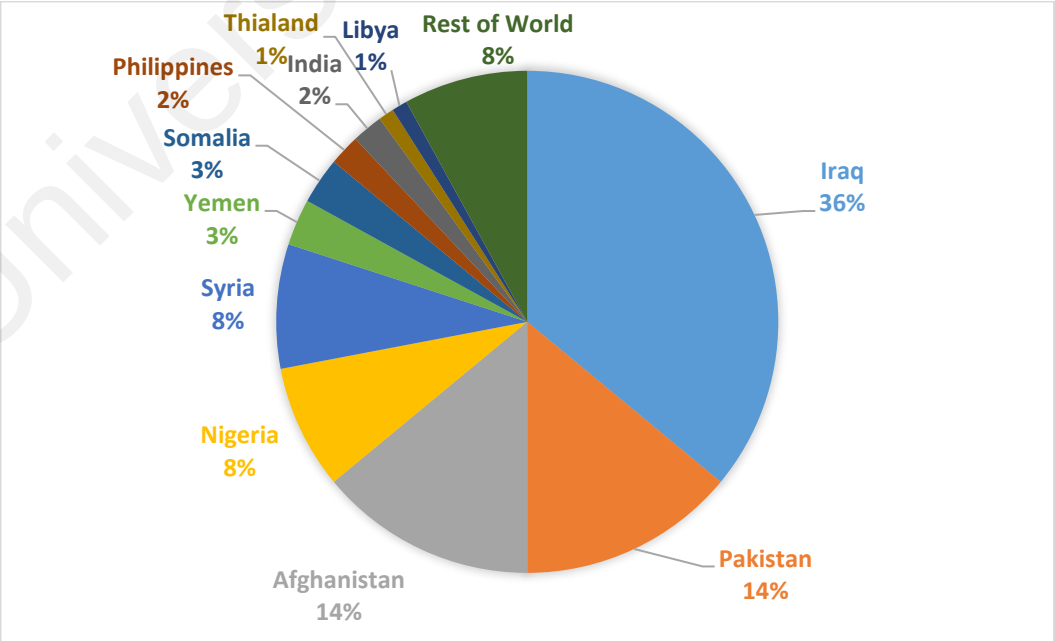

Figure 1.1: Top 10 Countries with the Most Number of Terrorist Attacks

Source: Global Terrorism Database (2014)

Terrorism is a form of conflict that has harmful effects on the economic and social well-being of a society that it threatens. Buckelew (1984) argues that the main objective of criminal or terrorist activities is to generate fear among the general public. Similarly, Wagner (2006) reports that terrorist actions create uncertainties and risks in a market that, in turn, have negative effects not only on the domestic economy but also on foreign trade. Terrorist violence that has caused huge economic costs has been witnessed all over the world (Asteriou & Siriopoulos, 2000; Drakos, 2004). Globally, the economic costs of terrorism have also increased dramatically. The Institute of Economics and Peace (IEP) conservatively reports that, in 2014, the economic cost of terrorism grasped its highest ever level at US$52.9 billion. This economic cost is 61 percent higher than that recorded in 2013 and represents a ten-fold increase since the year 2000 (GTI, 2015).

Blomberg, Hess, and Orphanides (2004) find that a circle of economists has a long account about the economic consequences of conflict and peace. They contend that the prominent leading economists of their time, such as Keynes (1919), Pigou (1940), Mead (1940), and Robbins (1942), have written about the interaction among war, peace, and economic conditions of that time and have offered economic policy based on economic rationale. Gupta, Clements, Bhattacharya, and Chakravarti (2004) observe and determine that most of the terrorist events and armed conflicts occurred in low-middle income economies.

Similarly, Gaibulloev and Sandler (2008) report that a single terrorist attack per million population decreases the gross domestic product (GDP) per capita growth by 1.5%. The authors examined this effect on 42 Asian countries from 1970 to 2004. This study further demonstrates that this effect can be large if the population of the economy is excessively large. For example, a country with a population of 100 million will have to experience 100 terrorist attacks. Similarly, Gaibulloev and Sandler (2010) investigate the determinants of income per capita growth for 51 African countries between 1970 and

2007. The results of their study confirm that a modest effect of transnational terrorism exists in the income per capita growth. However, these authors do not document any effect of domestic terrorist events on economic growth. The majority of the studies generally focus on the number of events, and a relatively modest effect on economic growth from terrorist attacks is documented.

1.2 Problem Statement

Terrorism, which has plagued major economies such as the 9/11 incident of World Trade Centre in the United States at the beginning of the new millennium, is a global challenge. Terrorism issue has not only affected the developed economies but also the poor economies of the world such as the economies of South Asia, Middle East and Africa.

Terrorism incident can occur at any time anywhere; thus, determining its magnitude and impact is difficult and unpredictable (Ekey, 2008). Terrorism is an act of violence, and it aims to attain political and economic objectives by disturbing the normal course of life (Enders & Sandler 1996a; Enders et al. 2006). Terrorism is commonly studied in historical, sociological, psychological, political, or geopolitical terms. However, it can also have substantial economic consequences. This form of violence has religious or ideological aims and economic consequences (Ismail & Amjad, 2014). Catastrophic terrorist attacks, such as 9/11, can put a dent on businesses and consumer confidence, thereby deteriorating investments and consumption and declining macroeconomic performance.

Several macroeconomic indicators, such as unemployment, poverty, income inequality, low economic performance, high inflation, and low trade volume, are caused by terrorism or can breed terrorism (Shahbaz 2013; Shahbaz et al. 2013). Similarly, most scholars have argued that economic factors, such as poverty and income inequality,

desperately matter in terrorism by affecting the levels of deprivation and feelings of injustice and by generating political instability (Abadie, 2006; Burgoon, 2006; Berrebi, 2007; Piazza, 2006, 2011). However, some scholars such as Krueger and Maleckova (2003) and Piazza (2006) report that terrorism and economic conditions have no direct relationship.

In general, the literature on the economic cost of terrorism, particularly in developing economies, is limited (Mehmood, 2014). Moreover, most studies on the effect of terrorist attacks on the economy have concentrated in developed economies (Eckstein & Tsiddon, 2004; Enders & Sandler, 1996). Existing literature ignores the developing countries especially the Islamic countries, which are most affected by terrorism activities. Sandler, Arce, and Enders (2008) explains that terrorism studies in developing economies are necessary. Blomberg, Hess, and Orphanides (2004) and Frey, Luechinger, and Stutzer (2007) examine that the effects of terrorism on the economic growth of developing economies are more severe than those on the economic performance of the developed world.

Previous works have conducted investigations to measure terrorism intensity by evaluating terrorism incidents or the number of deaths or injuries (Mickolus, 1980; 1982, Mickolus & Fleming, 2003). However, most of these works related to terrorism have mainly focused on only one type of terrorist activity, such as the number of incidents, or they merely sum up the number of deaths and injuries to measure terrorism. Unfortunately, the available literature that evaluates the intensity of terrorism and the quantification of the economic cost is limited. Focusing on a single type of terrorist activity cannot capture the true economic cost of terrorism. Additionally, the relationship of terrorism with macroeconomic factors is examined theoretically without the measurement of results (Morag, 2006; Ali, 2010; Schneider, Bruck, & Meierrieks, 2010).

Therefore, Thus, this study fills the gap in the literature by developing and constructing alternative indicators to evaluate the economic impact of terrorism and their application to four Islamic countries Pakistan, Afghanistan, Iraq and Syria. On one hand, the present study evaluates the economic impact of terrorism by developing two indicators, namely, the economic impact of terrorist evaluation (EITE) indicator and terrorist attack vulnerability evaluation (TAVE) approach. On the other hand, an indicator is constructed to determine the relationship between poverty and terrorism. Similarly, an index is developed to evaluate trade terrorism nexus. After developing these four indicators, then the empirical studies have been conducted to test these indicators practically (see Figure 1.2). The following research questions are addressed against this backdrop.

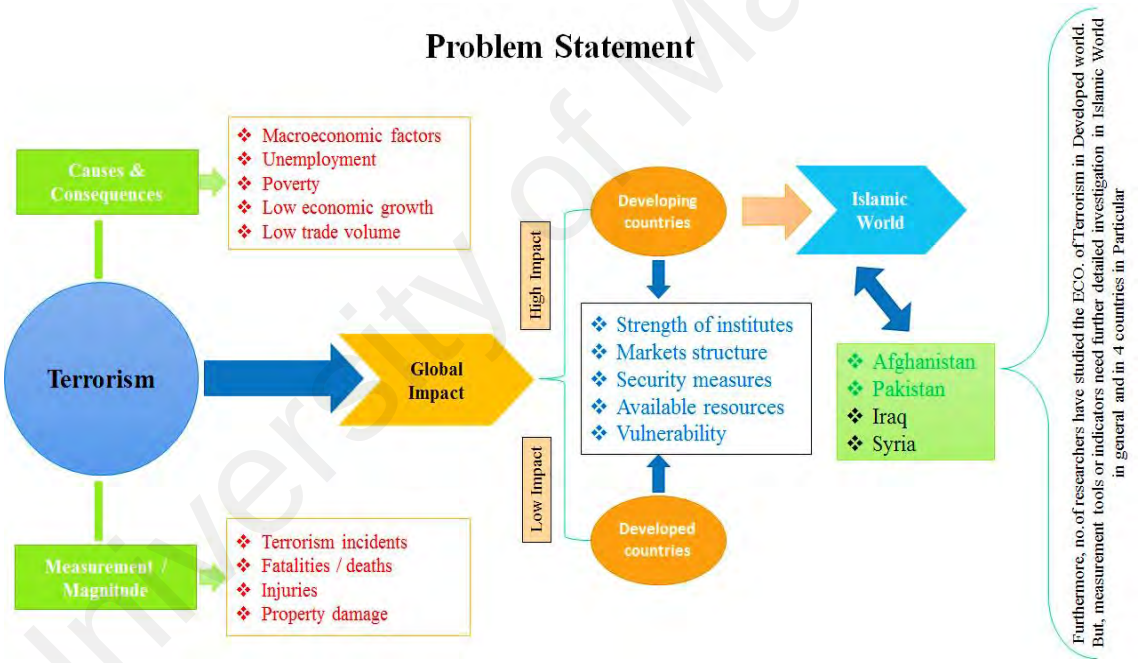

Figure 1.2: Problem Statement of Study

1.3 Research Questions

1. Does terrorism play a uniform role at province-level of a country?
2. How does poverty lead to terrorism?
3. Does terrorism affect international trade?
4. How much terrorism affects economic performance?

1.4 Objectives of Study

The main objective of the study is to develop indicators to examine the economic impact of terrorism. Specifically, it evaluates the intensity of terrorism at provincial level, poverty terrorism nexus, the economic cost of terrorism, and the effect of terrorism on international trade. Based on the preceding research questions, the following research objectives are designed:

1. To examine the measurement of terrorism at province level by introducing TEIE indicator;
2. To find the linkages between poverty and terrorism by an indicator PTEM;
3. To analyze the trade terrorism nexus by developing an indicator TTEI and its implications on the most terrorism-affected economies in the world, Iraq, Syria, Pakistan and Afghanistan; and,
4. To investigate the effects of terrorism on economic performance by applying TAVE model.

1.5 Contribution of Study

There is an immense literature on the economic causes and consequences of terrorism. However, there are still some critical gap in measuring the intensity of terrorism and its impact on economic performance. This study builds theoretical linkages to examine terrorism, poverty, economic performance, and international trade by developing alternative indicators. Moreover, this study applies alternative analytical indicators to evaluate economic causes and consequences of terrorism.

This study is not only useful for academic purposes but also provides useful contributions for policy recommendations and suggestions for the policy makers. At the end of the study, several recommendations are provided on the economic causes and

consequences of terrorism. And this study also suggests to curb terrorism in Islamic countries, in general and in the four Islamic countries in particular.

This research gives new insights into the theoretical and empirical studies on indicators to study the economic causes and consequences of terrorism in four Islamic countries. No formal indicators exist for examining the terrorism measurement and terrorism–poverty relationship at the province level. This study provides the theoretical and conceptual framework for the poverty–terrorism relationship, trade terrorist evaluation and empirical proof by testing the relationship between poverty and terrorism in the case of Pakistan and trade terrorism nexus in the case of four Islamic countries (Pakistan, Afghanistan, Iraq and Syria). This study also investigates to measure the measurement of terrorism at provincial (state) level. It also provides a new look to the study of international trade to evaluate how international trade can be linked to terrorism.

1.6 Organization of Study

This thesis comprises of seven chapters, which they are organized in article style format. Each analytical chapter is presented in an independent article, but interrelated with other chapters. The main idea of this study is to develop indicators to evaluate the causes and consequences of terrorism in four Islamic countries. Some of the indicators have been published during candidature period and have been citied in this thesis, while some of indicators are under review in different journals. The organization flow chart of the study is shown in Figure 1.3. Details of research study are designed as follows:

Chapter 1 introduces the study and highlights the problem statement, research questions, and research objectives. At the end of chapter one, the contributions and the study outline are introduced.

Chapter 2 presents the literature review on the theoretical basis of terrorism to understand the main consequences of terrorism in empirical studies. The first part is

related to overview of world terrorism in general and in Islamic countries in particular and second section represents the causes of terrorism and globalization, terrorism nexus. It is aimed to explain whether or not terrorism is part of globalization. The third part discusses the empirical studies on terrorism and economic performance of the world's economies.

Chapter 3 presents the first analysis of the chapter and covers the first objective of this work. This chapter is organized as follows. The first section presents the introduction. The second section provides the theoretical framework of the study. The third section presents the methodology of the terrorist economic impact evaluation (TEIE) model. The fourth section applies the TEIE model to the economies of Pakistan, Afghanistan, Iraq and Syria. The fifth and last section of this chapter presents a conclusion with some policy recommendations.

Chapter 4 is on "Poverty and Terrorism." This chapter covers second objective of this research. This chapter is organized as follows. The first section presents introduction of study. The second section discusses the theoretical framework, and the third section explains the methodology of the PTEM model. The fourth section presents the empirical part of the PTEM model application to the Pakistan economy. The fifth section evaluates the econometric analysis to support the PTEM model hypothesis. The sixth section presents the conclusion and policy recommendations.

Chapter 5 discusses the trade–terrorist evaluation index (TTEi) and related to the third objective. This chapter is organized as follows. The first section presents introduction of study. The second section explains the theoretical framework, and the third section presents the methodology of TTEi. The fourth section investigates the application of TTEi to the economies of Iraq, Pakistan, Afghanistan and Syria. The fifth section conducts an

econometric analysis to support the TTEi hypothesis. The sixth section presents the conclusion and policy recommendations.

Chapter 6 includes the fourth analytical chapter entitled "Terrorism and Economic Performance" and covers the fourth objective of study that how much terrorism affects economic performance. This chapter introduces the methodology of the terrorist attack vulnerability evaluation (TAVE) model and its application to four Islamic countries (Pakistan, Afghanistan, Iraq & Syria). This chapter is organized into few sections. Section 1 presents the general introduction. Section 2 explores the different theoretical frameworks of terrorism. Section 3 discusses the methodology of the TAVE model. Third part of the chapter explains the difference between the TAVE approach and the literature studies. Section 5 reports the results of the application of the TAVE model to Islamic countries (Pakistan, Afghanistan, Iraq and Syria) and Section 6 reports the results of the econometric analysis of the relationship between terrorism and economic performance in Islamic countries. Section 7 concludes with some final observations.

Chapter 7**,** the last chapter of this work, presents the conclusion and policy recommendations. This chapter is divided into three sections. The first section provides the conclusion of the study. The second section gives policy recommendations related to the research problem. The third section gives the limitations of the research and future studies.

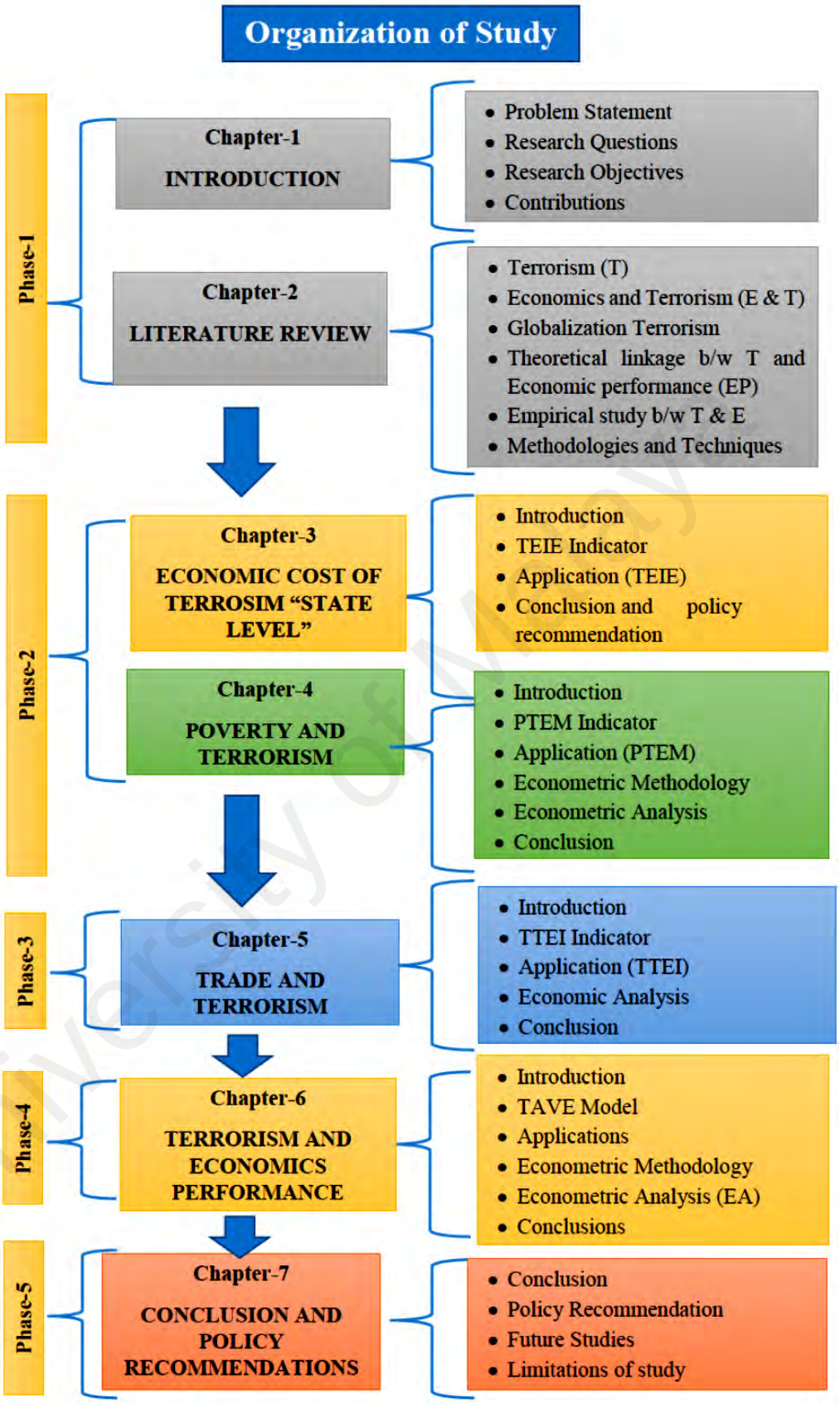

Figure 1.3: Organization of Study Flow Chart

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter examines both the theoretical and empirical works related to terrorism and economic performance. The following topics are discussed: definitions of terrorism by various international institutions and scholars, profile of terrorism in the four Islamic economies (Pakistan, Afghanistan, Iraq and Syria), profile of terrorist group ISIS, causes of terrorism, globalization as a promoter of terrorism, theories related to terrorism and economic performance, and empirical studies on terrorism and economic performance across the globe. The techniques used in previous literature related to terrorism studies have been discussed to explain terrorism studies in various perspectives. Second last section comprises the conceptual framework of study and last topic summarizes the whole literature chapter.

2.2 Definition of Terrorism

Since the beginning of the new millennium, terrorism has been considered a major international security threat. No single universal definition of terrorism exists. Many definitions of terrorism have been proposed by different scholars and government agencies, but no single and concise definition has been determined because of the political and ideological differences. Indeed, one man's terrorist is another man's freedom fighter. Terrorism can be defined as "the sub state application of violence or threatened violence intended to sow panic in a society, to weaken or even overthrow the incumbents" (Laqueur, 1996). It is also defined as follows:

(1) Organized use of violence and intimidation to achieve some goals

(2) Act of terrorizing

(3) State of being terrorized

The acts of violence are created by groups that understanding themselves as maltreated by some prominent historical wrong. Even though, all these terrorist groups have no

proper connection with the government, they have the economic and ethical backing of sympathetic governments. The United Nations (UN) Security Council Resolution 1566 (2004) describes terrorism as follows: "Criminal acts, including against civilians, committed with the intent to cause death or serious bodily injury or taking of hostages, with the purpose to provoke a state of terror in the general public or in a group of persons or particular persons, intimidate a population or compel a government or an international organization to do or to obtain from doing any act." This draft is still under conciliation, and it was submitted to the UN General Assembly in 1998 by the Indian government. In 1996, the UN Ad Hoc Committee on Terrorism, which deals directly with this problem of terrorism, was developed by resolution 51/210.

In the same vein, the European Union (2002) defines terrorism as follows: "This provides that terrorist offences are certain criminal offences set out in a line comprised largely of serious offences against persons and property which given their nature or context, may seriously damage a country or an international organization where committed with the aim of seriously intimidating a population, or unduly compelling a government or international organization to perform any act; or seriously destabilizing or destroying the fundamental political, constitutional, economic or social structures of a country or an international organization." The US Federal Bureau of Investigation (FBI) defines terrorism as "the unlawful use of force or violence against persons or property to intimate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objective."

Sandler and Enders (2005) explain terrorism as follows: "Terrorism is the premeditated use or threat of use of violence by individuals or sub national groups to obtain a political or social objective through the intimidation of a large audience, beyond that of the immediate victim."

Generally, Schmid (2004) reported that terrorism is considered both as a crime and as an approach to conflict. As a crime, it relates to making terrorist activities to kill the general public and destroy public property or personal capital. As a tactic of conflict, it alludes to attack on the civilian population or non-combatants in times of war intentionally. However, the objectives of using violence as a strategy are also imperative in explaining terrorism. Despite the fact that the political aspect of terrorism appears most defining as compare to other objectives of violence as they are not disregarded in the report of terrorist behavior.

Terrorism issue is as old as human history. However, the term *terrorism* acquired popularity only after the French revolution in 1779. The word "terrorism" was apparently first seen in the English language in reference to the "Reign of Terror," which is linked to the rule of France by the Jacobins from 1793 to 1794. Aside from the French Revolution, human history has many examples of violence, such as that committed by great warriors, including Alexander the Great, the Mongolians, Halaku Khan, and Genghis Khan, who killed thousands of innocent people. These acts of human violence were called terrorism by ancient human historians. Later in history, the world faced two great world wars, World War I and World War II, in which millions of people were killed. In the mid-1940s, the atomic bomb attacks on the United States on Japan created further terror around the globe as thousands of people were killed in only two bomb attacks. Despite these incidents, the study of terrorism, its causes, and effects still caught attention after the 9/11 terrorist attack in the United States in 2001 and the July 7 London bombings in 2005 (Michael, 2007).

Since the 9/11 terrorist attack in the United States, attacks have escalated significantly, such as the Madrid and London train blasts in 2004–2005, suicide attacks in Bali in 2002, and a series of continuous blasts in Pakistan, Iraq, Syria, and Afghanistan. These incidences spurred the research on alternative indicators to study the economic impact of

terrorism. Internationally, many studies have been conducted on the effects of terrorism in several countries and different economic sectors, such as tourism, foreign direct investment (FDI) flows, macroeconomic performance, and financial markets (Blomberg, Hess, & Orphanides, 2004; Enders, Sachsida, & Sandler, 2006; Fathi & Shahraki, 2011; Gupta et al., 2004; Liargovas & Repousis, 2010; Phillips, 2014; Sandler & Enders, 2004).

International organizations and scholars have provided the history and definitions of terrorism which explain the concept of terrorism. The following part of the chapter represents the profile of terrorism activities in Islamic countries.

2.3 Profile of Terrorist Activities in Islamic Countries

Terrorist attacks are diverse in terms of the human and capital damage caused. They are also unevenly distributed across countries. The Global Terrorism Index (GTI) has evaluated nations around the globe in light of the common patterns of peace and terror inside these nations. The GTI reports that terrorism intensity has been concentrated inside the Middle East, Asian and African economies as being most influenced by terrorist assaults. More than 60% of all incidents in 2013 occurred in four economies: Iraq (24%), Pakistan (19%), Afghanistan (12%), and India (5.8%). The 80% increase has been reported in deaths from the year 2012 to 2013. Remarkably only five countries (Afghanistan, Pakistan, Syria, Iraq and Nigeria) are accounted for 78% of death of worldwide terrorism in 2014. The terrorism incidents happened in these five nations alone further accentuating the alarming terrorism situation in these territories (GTD,2015). So, in terms of deaths the terrorism is 9 times higher than the 2000. Thus, economies highly affected by terrorism in the world are Pakistan, Afghanistan, Iraq, and Syria (GTD, 2013 & 2014) (see Table 2.1, 2.2 & Figure 2.1 & 2.2).

Table 2.1: Top 10 Countries with the Most Number of Terrorist Attacks

Country	Total Attacks	Total Number of Killed	Total Number of Wounded	Average Number of Killed per Attack	Average Number of Wounded per Attack
Iraq	2445	6378	14956	2.56	5.99
Pakistan	1920	2315	4989	1.21	2.62
Afghanistan	1144	3111	3717	2.72	3.25
India	622	405	717	0.65	1.15
Philippines	450	279	413	0.62	0.92
Thailand	332	131	398	0.39	1.20
Nigeria	300	1817	457	6.06	1.52
Yemen	295	291	583	0.99	1.98
Syria	212	1074	1773	5.07	8.36
Somalia	197	408	485	2.07	2.46

Source: GTI (2013)

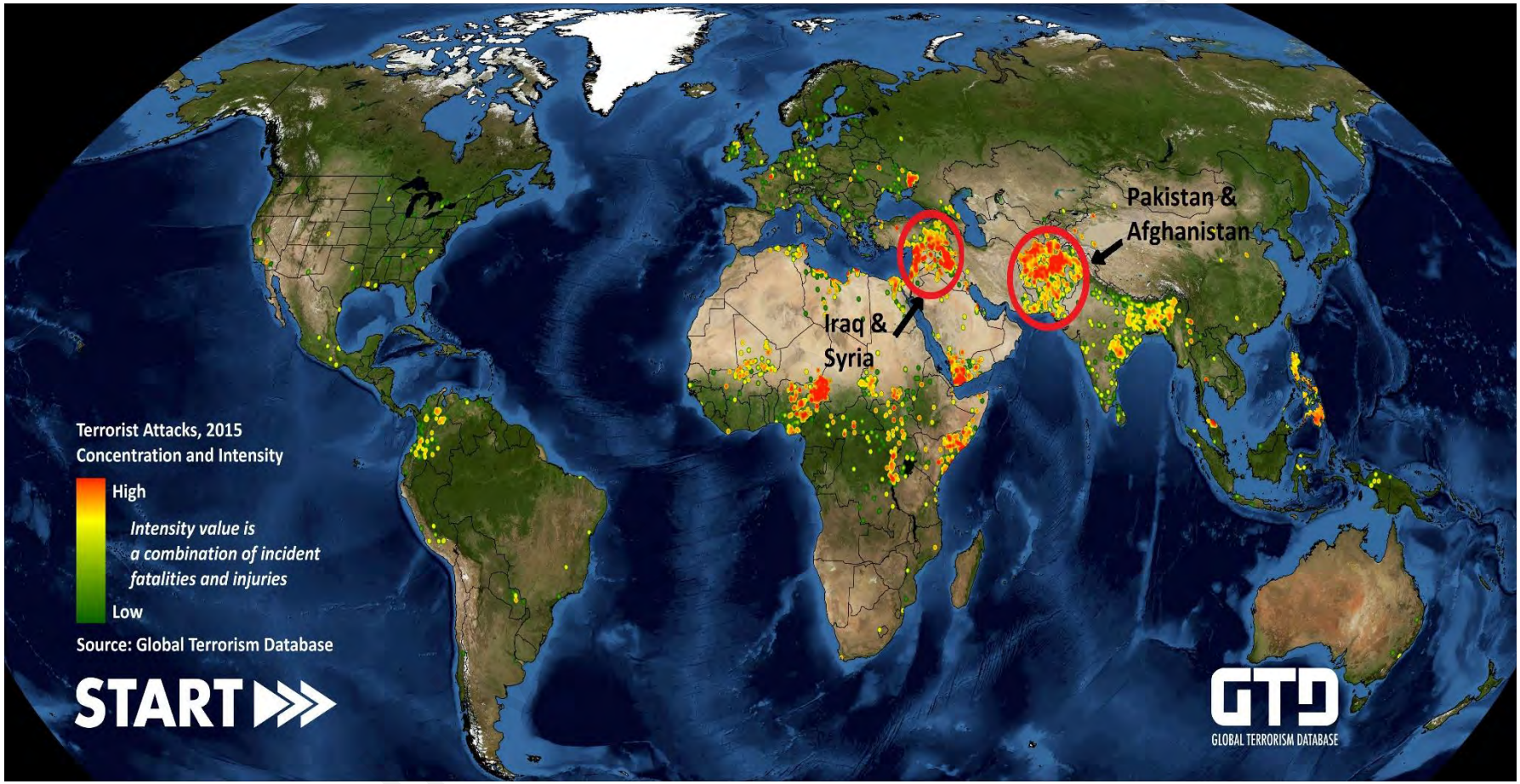

Figure 2.1: Global Terrorist Attacks, (2015) Concentration and Intensity

Source: GTD (2016)

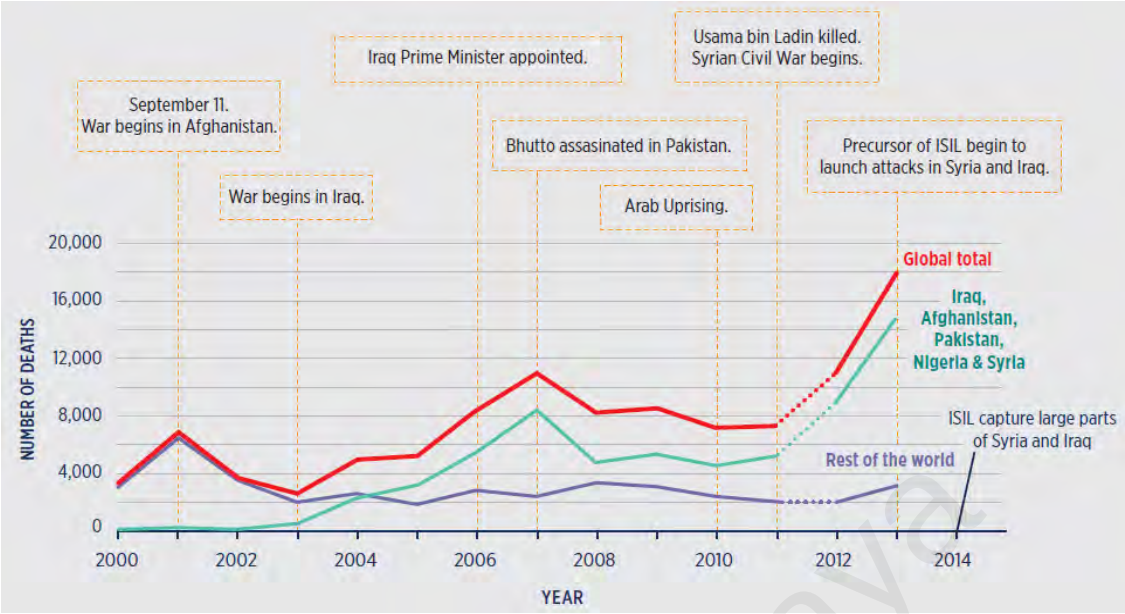

Figure 2.2: Deaths caused by Terrorism 2000–2013

Source: GTD (2014)

Table 2.2: Top 10 Countries with the Most Number of Terrorist Attacks

Country	Terrorist Attacks
Iraq	36%
Pakistan	14%
Afghanistan	14%
Syria	8%
Nigeria	8%
Yemen	3%
Somalia	3%
Philippines	2%
India	2%
Thailand	1%
Libya	1%
Rest of World	8%

Source: GTD (2014)

2.3.1 Overview of Terrorism in Pakistan

Pakistan is situated in a geographical location with the dispute of Kashmir on one side and an, insecure border with Afghanistan on the other side. Since its creation in 1947, Pakistan has been facing the issue of terrorism. Historically, there are five major aspects

that account for the emerging terrorism issue in the Pakistan economy. The first of them is when a military dictator, General Zia-ul-Haq, rose to the power and ordered the arrest of then elected Prime Minister, Zulfiqar Ali Bhutto. General Zia sentenced Zulfiqar Ali Bhutto to death by hanging in 1979. As a consequence, a terrorist group called Al-Zulfikar emerged to take avenge Bhutto. To control the Al-Zulfikar group, General Zia formed a new group called the Muhajir Qaumi Movement (MQM) to overcome the Al-Zulfikar group. According to the literature and historical facts, the MQM were responsible for 90% of terrorist incidents in the areas of Karachi and Hyderabad and for 40% of these incidents in the rest of the country at that time (Fair, 2004). The second event was the Islamic revolution in Iran in 1979. Before 1980, religion was not considered an issue in the Pakistan society. During that time, Shia-Sunni grievances began, and they resulted in religious terrorism in Pakistan. The third factor was the Afghan war. The issue of terrorism restarted with the Afghan war in 1980s, which attracted most of the militants from different regions of the world to Pakistan to fight against Russia. This incident, during which the militants were set together in the northern part of Pakistan, is considered the foundation and the root cause of terrorism in Pakistan (Weiner, 1998). After the defeat of Russia in Afghanistan, Taliban's took control of Afghanistan. The fourth factor was the defeat of the Soviet Union in Afghanistan. The Taliban gained control of Afghanistan. The mujahedeen living in the northern part of Pakistan and Afghanistan were supported by the United States. These Arab-inspired mujahedeen comprised the likes of Usama Bin Laden, who later became one of the most wanted terrorists settled in Afghanistan. The fifth event was the 9/11 incident in 2001 in the United States. This major incident brought a new dimension to terrorism and as a result, Afghanistan was attacked. During the course of this attack, Pakistan provided logistic support to the United States against the Taliban in Afghanistan, resulting in the beginning of militant and terrorist activities in Pakistan.

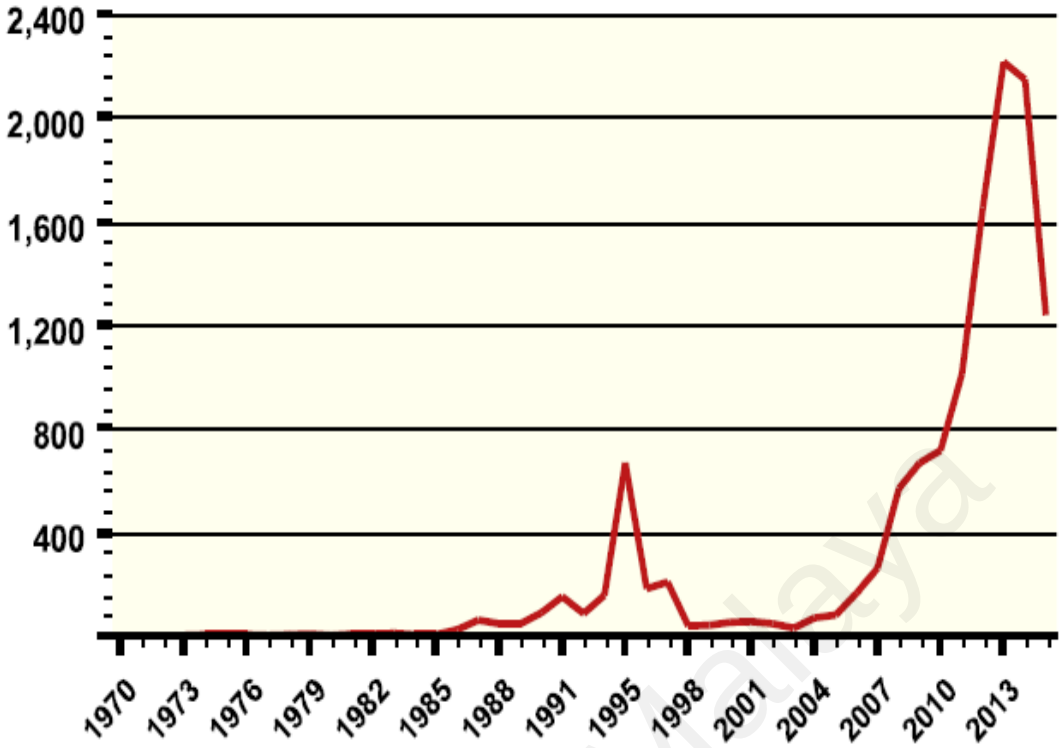

Figure 2.3: Pakistan Terrorism Incidents

Source: GTD (2016)

Table 2.3: Loss to the Economy of Pakistan caused by Terrorism ($ Million)

Organization	2011–2012	2012–2013	2013–2014	Total
Exports	1237	730	323.13	2290.13
Compensation to Victims	24.28	20.96	13.97	59.21
Foreign Investment	4597	210	3260	8067
Privatization	277	4719.46	0.0	4996.46
Industrial Output	331.69	308.49	129.61	769.79
Cost of Uncertainty	121.83	50.34	32.61	204.78
Expenditure Overrun	111.96	324.58	207.98	644.52
Others	1398.88	522	556.65	2477.53
Total Loss	11797.58	9968.61	6693.70	28459.89

Source: GoP (various Economic Survey issues)

Table 2.4: Cost of War on Terrorism

Year	$Billion	Rs. Billion	% Change
2001–02	2.67	163.90	_
2002–03	2.75	160.80	3.0
2003–04	2.93	168.80	6.7
2004–05	3.41	202.40	16.3
2005–06	3.99	238.60	16.9
2006–07	4.67	283.20	17.7
2007–08	6.94	437.10	48.6
2008–09	918	720.60	32.3
2009–10	13.56	1136.40	47.7
2010–11	23.77	2037.33	75.3
2011–12	11.98	1052.77	-49.6
2012–13	9.97	964.27	-16.8
2013–14	6.69	701.26	-32.9

Source: GoP (various Economic Survey issues)

Terrorism is a main issue in the Pakistan economy. So, for, more than 50,000 civilians have been killed in numerous terrorist attacks in Pakistan. The deaths have affected the economy of Pakistan badly (see Tables 2.3 & 2.4 & Figure 2.3). Annual GTI (2015) statistics report that Pakistan is ranked fourth in terrorism globally. Accordingly, the government of Pakistan has taken several measures to implement counter-terrorism policies after the terrorist attack on the Army Public School in the KPK province in Peshawar on December 16, 2014. The terrorist attacks in Mastung in Balochistan and Safoora in Sindh further strengthened the national consensus to eliminate terrorism in Pakistan. This national commitment led to the announcement of the NAP in January 2015 by the Prime Minister, and it led to the formation of military courts and the removal of a moratorium on the death penalty (Interior Ministry, 2015). The other objective of the NAP is to prevent hate speeches and terrorism-related literature. For this purpose, the use of loudspeakers is restricted. The NAP also froze the funds of terrorist groups that they use to finance their activities. The funding, of many terrorist groups such as TTP, Al Rashid Trust, Jaish-e-Mohammad, and Harkat ul Jihad Islami has been banned, and the finances of these terrorist groups have been frozen in Pakistan. They are not allowed to

open new offices or to establish another name for their organization. All the internal NGOs have been directed to register with the Interior Ministry of Pakistan to check and balance the activities of foreign-funded NGOs (Crisis Group, 2015).

2.3.2 Overview of Terrorism in Afghanistan

Apart from Pakistan, Afghanistan is another country that suffers from terrorism. The war in Afghanistan started in 1979 by the Soviet Union attack on Kabul. In that war, United States of America (USA) and Pakistan provided financial and defense support to Afghanistan. Resultantly, Soviet Union lost the battle and had to flee from Afghanistan. But this war generated internal conflict among different groups to control the government. During 1996, Taliban, the Islamic group, had the control of most of the parts of Afghanistan and came into power as the government. The 9/11 attack on USA brought the war to Afghanistan soil once again. The Al-Qaeda leader Osama bin Laden was held responsible for those attacks in US. The US demanded Osama bin Laden from the Afghan government. The Afghan Taliban refused to hand over Osama bin Laden to US, and as a result, US attacked on Afghanistan in October 2001. The Taliban government was demolished and the Taliban started a guerrilla war against the foreign troops. So far thousands of people have given their lives in this war and the death toll is still rising. According to GTD report, there were 440 cities attacked by terrorist groups in 2013 and there was a 10% increase in terrorist attacks in 2013 than 2012. The Taliban terrorist group in Afghanistan had its deadliest year for terrorism in 2015, with 4,502 deaths. There is an increase of 29% in the death tolls as compared to the previous year by 2014. The year 2015 also was the deadliest year for conflict deaths in Afghanistan economy with 34 % increase from the previous year by 2014 (Figure 2.4).

The sustained war in Afghanistan continues taking and decimating lives, both because of the direct consequences of violence and the war-induced breakdown of public health,

security, and infrastructure. Thousands of civilian lives have been lost their lives by different types of terrorist attacks such as crossfire, improvised explosive devices, assassination, bombing, and night raids into houses of suspected rebels. The total terrorist activities took place from 2000 to 2013 was 40458. The total number of suicides attacks that took place in Afghanistan from 2000 to 2013 was 366, where 175 were blasted in 2013 only. The total number casualties in Afghanistan in the last decade was 14228. The total number of blasts from 2000 to 2013 is 3190. Data of terrorism activities explain that there is an increase in their occurrence from 2000 to 2013 in Afghanistan (GTI, 2014).

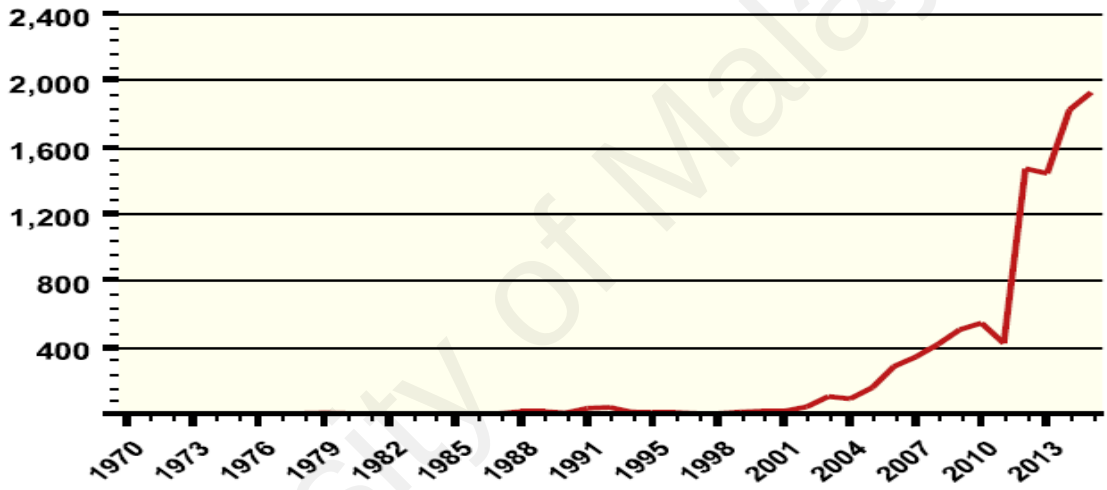

Figure 2.4: Afghanistan Terrorism Incidents

Source: GTD (2016)

2.3.3 Overview of Terrorism in Iraq

Iraq is the Middle East country, where its capital city name is Baghdad. Iraq got freedom from the British on October 3, 1932. Iraq is a Sunni Muslim majority country, where the second largest population are Shia. Iraq is situated in the Middle East at the northern most extent of the Persian Gulf. Iraq shares borders with Saudi Arabia on north side and Iran from the south side, while Syria on Northwest and Turkey on the east side.

Iraq is one of the most affected countries by terrorism since 2003. The number of deaths has increased to 162% since 2012. There are 19 different terrorist groups which are involved in terrorist activities in Iraq economy (Stanford University, 2016). Of all the terrorist attacks, ISIS claimed and took responsibility of 77%. Moreover, in the year 2013 about 4660 people were murdered due to terrorist attacks by unknown factors. There were 232 numbers of suicide attacks were recorded in Iraq in 2013, in which 27% of fatalities were reordering due to these suicide attacks. The levels of death numbers in Iraq are the highest numbers in a single country by the year 2000. There were three times the same number of terrorist deaths in Iraq in 2014 than in the whole world in the year 2000 (Figure 2.5). The ratio of death and injuries per terrorism attack is too much high in the case of Iraq. According to the GTD report, the average number of fatalities and injuries was also too high and number of deaths and injuries per suicide terrorist attack is 10 and 18 respectively (Figure 2.6). The most terrorist affected areas in Iraq are Baghdad, Karbala, Mosul, Kirkuk, Baqubah and Tuz Khormato (GTD, 2014).

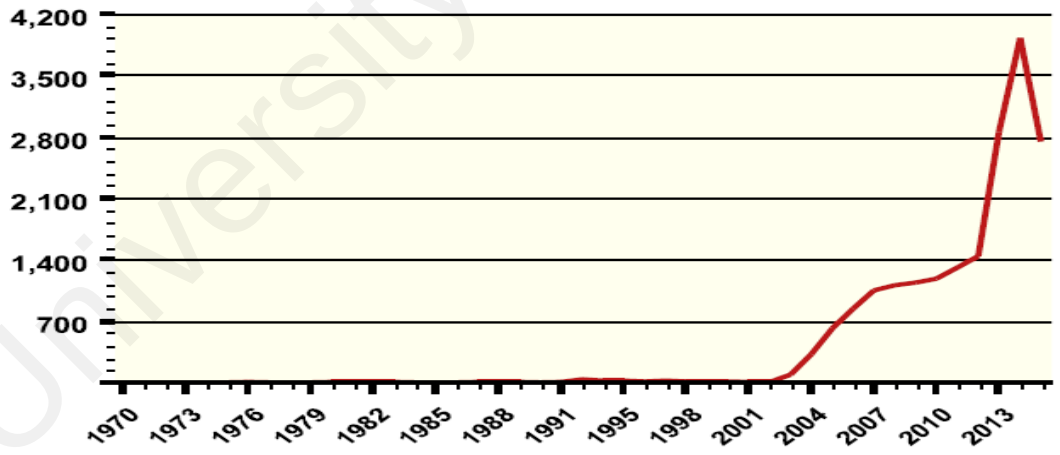

Figure 2.5: Iraq Terrorism Incidents

Source: GTD (2016)

Iraq economy is mainly dependent on the export of oil, which contributes more than 90% of government sources of revenues. Moreover, 80% of foreign exchange earnings are coming to Iraq economy from export of oil. In the year 2012, Iraq has increased oil

exports to 2.6 million barrels per day which are higher than the past 30 years. For the economic policy, Iraqi government is steadily forwarded to build the institutions such as bring improvement in legislation and justice. Furthermore, the political stability is the important factor in the case of Iraq, that will boost up the investors' confidence, as previously the investment environment is not conducive by the incidence November 2012 deadlock between the province of Baghdad and Erbil and the firing of the Central Bank Governor in October 2012. The biggest hurdle in the ways of foreign direct investment is including a fragile political system and concerns about security and economic stability. Along with that other issues such as extensive corruption, inadequate of the basic needs, obsolete infrastructure, lack of skilled labor force, and antiquated commercial laws suffocate and reduce investment opportunities. These factors are also responsible for poor economic performance in all rest of the sectors of economy (CIA, World Factbook, 2016).

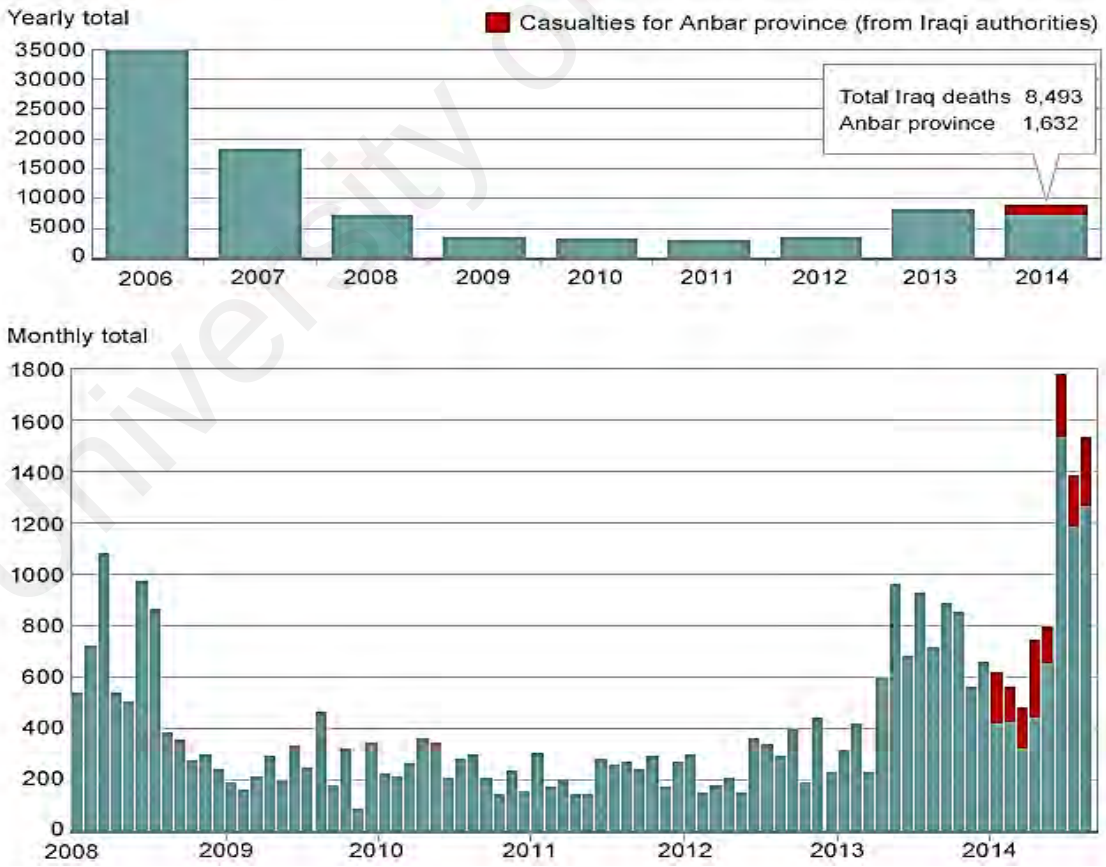

Figure 2.6: Number of Deaths in Iraq

Source: UN Assistance Mission for Iraq (2015)

2.3.4 Overview of Terrorism in Syria

Syria is another Middle East economy, which is situated in South Western Asia, at the eastern side and of the Mediterranean Sea, with Turkey towards north, Iraq towards the east, Jordan towards the south, and Israel and Lebanon toward the west.

The terrorist attacks have got the momentum in the Syrian economy when the civil war started in 2010. Only in the year 2012, the total number of terrorist attacks recorded was 136, which have killed 600 individuals. Similarly, in the year 2013, the total number of terrorist attacks was increased from 136 to 217 and those terrorist incidents more than 1000 individuals were killed (Figure 2.7). More than fourteen different terrorist groups were doing their terrorist activities in Syria. So far, terrorism and civil war have killed 18, 0000 to 26, 0000 people and displaced over 35% of the local people. The names of the biggest terrorist groups in Syria comprise ISIS global terrorist group, the Free Syrian Army, Hezbollah and Popular Front for the Liberation of Palestine, Gen Cmd (PFLP-GC). In the year 2013, the Sunni and Al-Qa'ida linked terrorist group Al-Nusra Front was accountable for more than 40% of fatalities in Syria. More than 70% of the terrorist attacks types were comprised of bombing or explosions and have targeted the civilians. The ratio of kidnapping foreign tourists in Syria was also on the higher side and at least 16 European journalists were kidnapped which were including Danish, French, Italian, Polish, Spanish and Swedish journalists. Similarly, two American journalists, James Foley and Steven Sotloff were kidnapped and later on in the year 2014, both hostages were killed by ISIS. In 2013, terrorist attacks have been observed in more than 57 cities. The percentage ratio of the incidents was higher in the main capital city, where 42% of the terrorist attacks occurred in the capital city; Damascus (GTD, 2014). The estimated fatality number has surpassed 220,000 people (UN). In 2014, a large portion of the Syrian populace was compelled to leave their home land and their numbers are almost 7.6 million. According to the UNHCR report 2016, 4 million Syrians have been counted

refugees which are not only settled and resided in Syria's neighboring countries such as Iraq, Jordan, Lebanon, Turkey and also in Egypt. Now the emigrants use the legal and illegal ways to enter in European countries. Moreover, more than 12.2 million Syrian people require emergency aid. Other than adult and aged people, 5.6 million kids are included in these misery migrants (SCPR, 2016). Furthermore, the terrorism and war effected economy of Syrian not only faces the issue of terrorism and war, but also faces the economic problems such as international sanctions by the international community against the Syrian government, huge damage of buildings and roads due to the terrorist attacks and civil war, reduction in the output and consumption along with increases in inflation. The government of Syria also has struggled to address the issues of poor economic performance which are including decrease in foreign exchange earnings, increasing in budget expenditure and also increasing in trade deficits, and the depreciation of the Syrian pound.

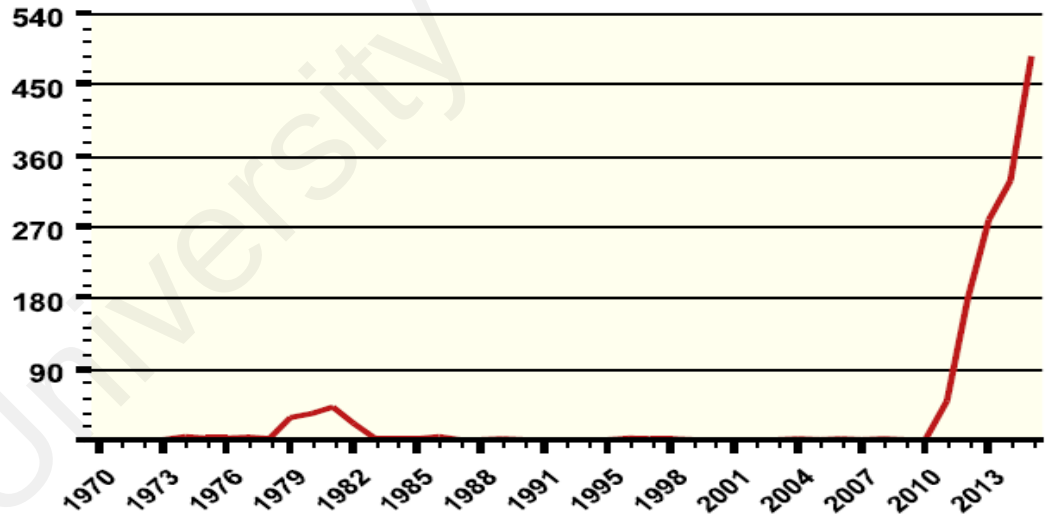

Figure 2.7: Syria Terrorism Incidents

Source: GTD (2016)

2.3.5 ISIS Terrorist Group

ISIS, also called as ISIL, Islamic State or Daesh, is a global terrorist group which has initially based on two Middle East economies, Syria and Iraq. Basically, the ISIS terrorist

group emerged from al-Qaida based in Iraq. Then the ISIS terrorist group is spreading into Syria during the Syrian civil war. ISIS is the terrorist group which has captured the area of territory in eastern Syria and Iraq. The main objective of this terrorist group ISIS is that to make a state on the name of Islamic laws and led by a religious leader called "Caliph". Presently the ISIS is doing its operation and terrorist attacks mainly in Iraq and Syria, but this group wants to extend its boundaries to Jordan and Lebanon.

The late Abu Musab ul-Zarqawi has laid the foundation of ISIS in 2002, which later has made an alliance with another terrorist group namely AL-Qaeda in Iraq. Before ISIS, AL-Qaeda was considered as the major insurgency group globally. During 2006, after the death of Zarqawi, Al-Qaeda in Iraq was merged into Islamic State in Iraq (ISI). Until 2009, the ISI was not that much strength and was considered as a weak insurgent group. Later in the year 2010, Baghdadi became the leader to run the ISIS group. The profile of the leader demonstrates that he has a PhD degree and is a very well-educated person. In 2013, Baghdadi merged the Syrian and Iraqi insurgent groups and laid the foundation of the ISIS. In 2014, ISIS occupied major part of Iraq including the cities of Fallujah and Mosul. ISIS has control on hundreds of square kilometers' area in Iraq and Syria. Some statistics show that so far, the total area controlled by ISIS is thousand square miles which is almost equal to the area of Austria, one of the European union economy. According to the Central Intelligence Agency (CIA) report, the total number of foreign fighters in ISIS terrorist group is in the range of 20,000 to 31,500 (Lister, 2014).

The terrorist group ISIS has expanded their activities in at least more than 19 countries by the year 2013 to 2015. With an advance and complex Internet and online networking effort, and by utilizing by the ongoing war in Syria and sectarian violence in Iraq, ISIS has possessed the capacity to draw in more than 25,000 contenders from outside the Islamic State's region to join its positions in Iraq and Syria. These outside contenders incorporate more than 4,500 natives from Western countries, including around 250 U.S.

subjects who have either flown out to the Middle East to battle with fanatic associations or endeavored to do as such. So, for, more than 110 countries residents have joint the ISIS, where the highest number of foreign fighters is belonging to Tunisia (see Table 2.5 & Figure 2.10). Most of the recruits in SIS terrorist groups are belonging to low level of education and fewer opportunities of jobs in their home countries (see Figure 2.8). The civil war in Syria has been the main catalyst for the younger population of Syria to join ISIS terrorist group, which is fighting against the government of Syria. Astonishing ISIS success in Iraq, where, in June 2014, it captured Mosul, Iraq's second-largest city, and ISIS leader Abu Bakr al-Baghdadi's declaration of a caliphate. This incident of the announcement has further attracted the flow of foreign fighters. ISIS's remarkable achievement in utilizing remote contenders from around the world has been its capacity to influence vulnerable youthful Muslims of a civilization's conflict amongst Islam and the West.

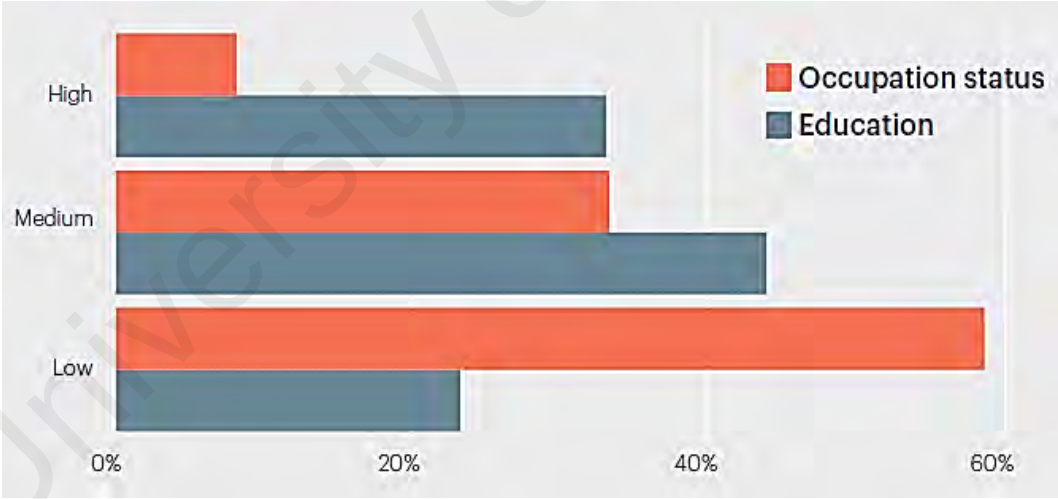

Figure 2.8: Education Level vs Occupation Status of ISIS Terrorists Recruits

Source: IEP (2016) Calculations

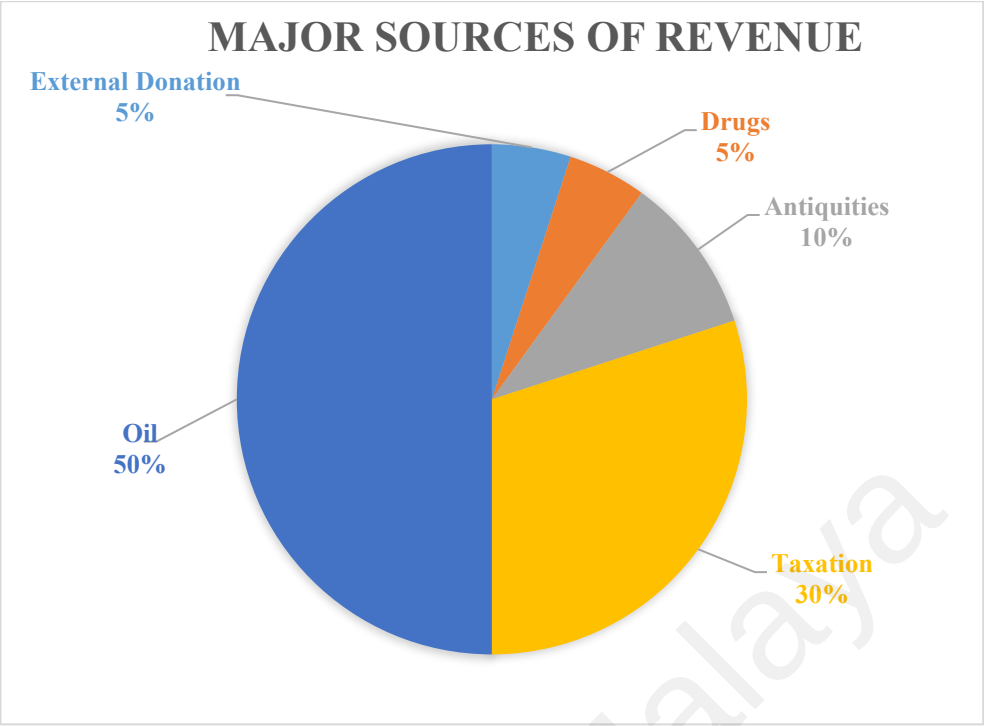

Figure 2.9: Sources of Revenue of ISIS Terrorist Group

Source: IEP (2016) Calculations

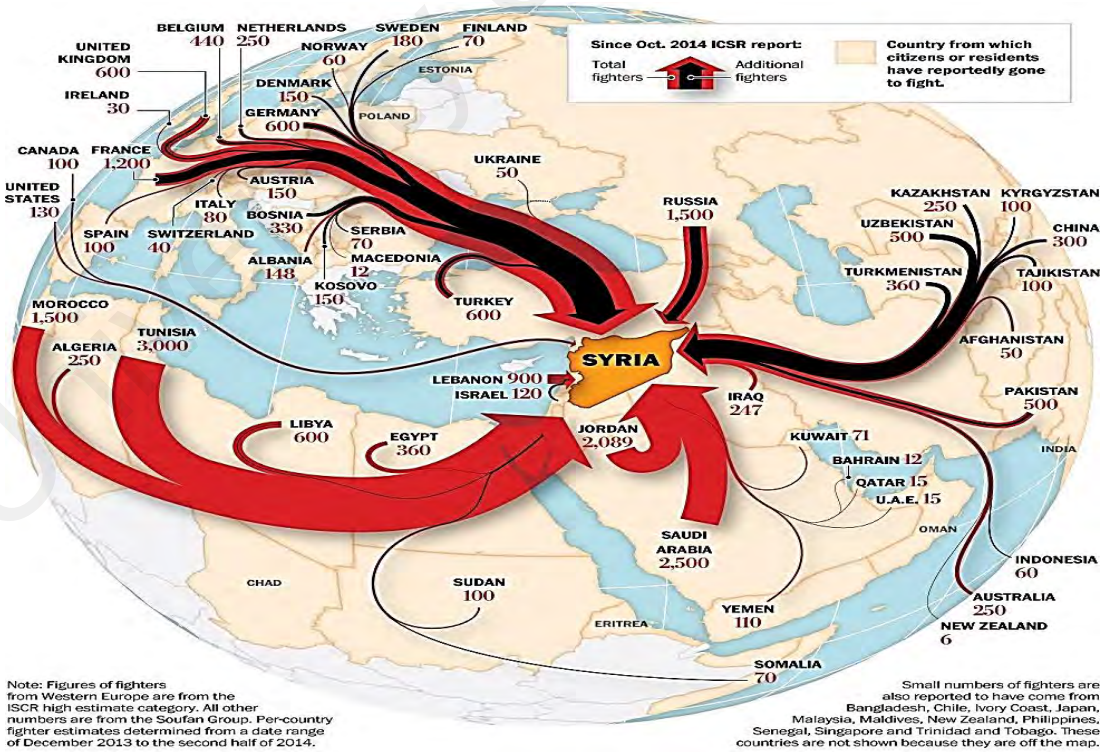

Figure 2.10: ISIS Foreign Fighters Flow

Source: Stepanova (2015)

The main sources of financing of ISIS are oil selling, taxation, donations and kidnapping foreigners to demand money from the host country. The recent example of such incident is of Japanese hostages kept by the ISIS group and for the releasing of those kidnappers. They have demanded the money from the Japan's officials. France is thought to have funded $14 million for the release of four journalists. Moreover, they are also taking the toll tax from vehicles and truck drivers. The other source of income of ISIS is that they attack on large territory and sometimes attack banks and steal money from those banks. Currently, ISIS is one of the richest terrorist group with almost US $ 2.38 billion (see Figure 2.9). The ISIS is getting support of the local people by distributing foods, recreational activities for kids and are also arranging hospital facilities for the local community, where the government is fail in this case and the sympathies are gained by the terrorist group (Giovanni, Goodman & Sharkov, 2014).

Table 2.5: Foreign Fighters in ISIS Terrorist group by Country

Country	Number	Country	Number
Tunisia	6000	Indonesia	300
Saudi Arabia	2275	Kazakhstan	250
Jordan	2000	United States	250
Russia	1700	Austria	229
France	1550	Bosnia	200
Turkey	1400	Netherlands	190
Morocco	1200	Tajikistan	190
Lebanon	900	Algeria	170
Germany	700	Malaysia	154
United Kingdom	700	Sweden	150
Egypt	600	Israel/Palestinian	150
Libya	600	Canada	130
Pakistan	500	Kosovo	125
Uzbekistan	500	Australia	120
Belgium	380	Denmark	115
Turkmenistan	360	Yemen	110
China	300	-	

Source: Heritage Foundation research based on reports from the Committee on Homeland Security, https://homeland.house.gov (accessed December 10, 2015); The Soufan Group, "Foreign Fighters" December 2015, http://soufangroup.com/wp-content/uploads /2015/12/TSG ForeignFightersUpdate3.pdf (accessed December 15, 2015).

Similarly, other than the source of funding of ISIS, the sources of weapons that ISIS fighters are using advance technology and also have a huge number of different weapons. According to Corera (2016) report, in the early period of the dispute in Iraq and Syria, the majority of weapons were taken from the combat zone from Iraqi and Syrian forces. But by the end of 2015, the ISIS terrorist group began to see another noteworthy source. Ammunition boxes were turning up that could be traced back to manufacturing plants and factories in Eastern Europe. There is also strong evidence that the material had been sold legally to the governments of the United States and Saudi Arabia. It was then delivered and shipped through Turkey.

2.3.6 Effect of Terrorists on the Migration of Syrian People to Europe

The death of a Syrian boy, Aylan, at sea shook the whole world. Emigrants have a miserable condition. For example, thousands of people arrive from Syria and the Middle East every day in rickety boats, and they gather at a Hungarian train station. Children sleep on floors without any food. Thus, so far more than 19 million people have fled their homes because of war and terrorism. Most of these migrants hope to go to Europe. Two reasons account for why this crisis has escalated. One issue is that millions of people are forced to flee their home countries because of war and crises, and different routes to Europe have opened. The second issue, which further highlights this problem, is the anti-refugee policies of Europe and other developed economies. Politicians of these economies argue that the arrival of immigrants to their countries makes their economies insecure.

Among Middle East countries, Syria is the largest driver of this crisis. Since 2011, about four million people, approximately one-fifth of the whole Syrian population, have fled. What are the causes of the large number of migration from Syria? On one hand, the government of Bashar al-Asad sanctioned the army and its allies to attack civilians with chemical weapons and barrel bombs. On the other hand, the terrorist group ISIS committed murder, torture, and sexual slavery, and another terrorist group called Jabhat

al-Nusra humiliated and killed innocent Syrians. Some migrants who are rich want to go to rich economies to search for opportunities for themselves and their spouses. Before the Arab spring, Gadhafi, a Libyan leader, accommodated several migrants from Africa. In Libya, the migrants were tortured and raped. However, the developed economies were happy at that time that someone did something to solve the issue of migrants. However, the situation has worsened. When Arab spring occurred in 2011, Gadhafi's regime was overthrown. The journey to Libya became dangerous; thus, refugees and economic migrants searched for ways to travel to Europe. The Arab spring eventually generated the Syrian war and an internal conflict in Yamen. It also brought about and empowered the terrorist group ISIS in Syria and Iraq.

Some questions are raised about the preference of these migrants to travel to Europe instead of other neighboring countries. First, these migrants travel to Europe because the problems in their home countries have become too dangerous to handle. Second, the already-existing camps for refugees and migrants have also become dangerous, and staying in those camps, is hopeless. Moreover, policies of rich economies leave much to be desired. Rich economies try to discourage migrants by ignoring the policies that can ease the danger of their journey to Europe. For example, the United Kingdom has cut the funding previously used for rescue operations. Before this funding was cut, it has saved approximately 150,000 migrants. During this summer (2015), nearly 2500 migrants died. These deaths did not occur because of an incident but because of European policies that were meant to discourage these migrants (SCPR, 2016). Every European country wants to ignore the issue of migrants, and they believe that helping them is not their responsibility. The United Kingdom does not want these migrants. France wants Italy to keep the migrants. Italy wants Greece keeps them, but Greece does not want them in its territory. Resolving the issue on migrants is urgent. Developed countries should address the misery of these migrants and help decide to leave these people in their home countries

and let them face barrel bombs and chemical weapons, to keep them in the camps of Jordan for a long time without any future prospects, or to do something for the betterment of humanity (Taub, 2015).

2.4 Causes of Terrorism

The issue of terrorism is not a simple phenomenon but rather a complex issue which has been linked with ideology, organization, and commencement. It cannot be treated specifically in historical perspective nor it be dealt as a general issue. Mainly, the issue of terrorism is rooted in political instability, which ultimately converts into violence (Crenshaw, 2005). Every terrorist action needs a precise source to defend the action of terror tactics to his own mind and to the general public with whom he or she knows to reach the voice. All insurgents and terrorist fighters are not ill-minded people. According to the mind and thinking of terrorists, their actions of doing terrorism are correct and logical.

2.4.1 Socioeconomic Conditions

Sageman, (2008) reported that the causes of terrorism are considered to be linked social, economic, political, cultural, religious and historical. All these factors are considered as the root causes of terrorism. Moreover, among the above factors, the significant ones are poverty, ignorance, biased education, insufficient economic opportunities, and restriction on free political expression. Do economic conditions cause terrorism? The answer is not straightforward. On one hand, most scholars have argued that economic conditions, such as poverty and income inequality, desperately matter in terrorism as they affect the levels of deprivation and feelings of injustice and thus generate political instability (Burgoon, 2004; Krieger & Meierrieks, 2011). On the other hand, scholars such as Krueger and Maleckova (2003), Gassebner and Luechinger (2011) and Piazza (2011) have reported that no direct relationship exists between terrorism and poverty.

The most popular study relating to poverty and inequality with political violence is that by Gurr (1970), who introduced the term "relative deprivation." Gurr associates economic disparity with the propensity of individuals to choose criminal and terrorist actions. Gurr uses relative deprivation to "indicate the tension that grows from a discrepancy between the normative and the positive of aggregate value satisfaction that compels persons to violent activity." Political violence tends to occur when the expectations of individuals on the economic or political goods surpass the actual distribution of these goods. The work of Gurr provides a theoretical basis to study political violence, including terrorism.

Terrorism is linked to political instability, and it can be connected with economic problems. For instance, the effect of politics on the economy comes from the economic policies designed by politicians. However, the policies of the political government generate poverty, disparities, and injustice; thus, the people's protest against the government. This intuition explains the connection between economic conditions and terrorism. Testas (2002) argues that when the economy does not perform well. The economic indicators are on the declining side and the standard of living of people decreases. This economic instability causes the people to start making protests against the government and against the ruling party. Therefore, this argument proves that economic conditions affect the root causes of terrorism. The study of Blomberg et al. (2004) present an economic model of terrorism in which they examined that limited access to economic resources increases the chances of joining the terrorist groups by misery people and ultimately the opportunity cost of terrorism decreases.

Scholars such as Landes (1978), Sandler, and Enders (2008) use the economic model of criminal offense in international terrorism. Economic model yields few concrete predictions in terms of the association between market opportunities and participation in

terrorism because participation in terrorism is served by individuals with different characteristics. The action of terrorist to do for terrorism is determined by the possibility that participation will result in the desired outcome and in the differential payoff for various groups associated with obtaining the desired aims of terrorists compared with the penalties associated with failing. For example, well-educated individuals can be more disproportionately involved in terrorist groups if they feel that they can assume command position when the group becomes successful or if they identify more strongly with the objectives of the terrorist group than people with limited education (Krueger & Maleckova, 2003; Enders & Sandler, 2004).

2.4.2 Does Globalization Promote Terrorism[1]

The world has become a global village. Drastic advances in technology and communication have intensified the ever-increasing pace of globalization. This study is an attempt to examine globalization from an evolutional point of view. Furthermore, it evaluates whether or not terrorism is part of globalization. The interrelation between terrorism and globalization is subject to controversies. On one hand, some views assert that terrorism is spreading not because of globalization but because some people are excluded from globalization. On the other hand, certain views claim that globalization may be one of the main causes of the spread of terrorism because it assists terrorist groups to distribute their literature and enforce their views on like-minded people in other parts of the globe. In light of this background, the first section of this part of the literature defines the notion of globalization, the second section discusses the characteristic of globalization, the third section explores the history of globalization, the fourth section

[1] The literature worked related to globalization and terrorism has been published in ISI journal with the title "Globalization and Terrorism: an overview".

evaluates the existing controversies, and the fifth section investigates whether or not terrorism is part of globalization.

2.4.2.1 What is Globalization?

The term *globalization* has become popular in the last two decades because of the advancement of telecommunication and information technology (Scheuerman, 2006). The existing and new concept of globalization explains that a non-territorial world has no boundaries; in this area, only the interest of the business culture exists, and information technology enables business to be performed as a distinct unit (Friedman, 2006; Ohame, 1995; Renesch & Harman, 1992; Robertson, 2006; Scheuerman; 2006).

Reich (1998) summarizes the conclusive definitions of globalization of different scholars. According to Reich, globalization is an ambiguous term that is frequently used in the current scenario. Globalization stands for a large public coverage across the world as one of the defining terms "social consciousness" in the late 20th century (Scholte, 1996). The term "globalization" is frequently defined as what globalization is not instead of what it actually is? Another scholar, Rosenau (1996), identifies the theme of globalization and finds that globalization and globalism are differ. In particular, globalization points to aspirations for an end state of affairs, and the values are shared by or pertinent to all the world's more than 7 billion people, their surroundings, their roles as residents, customers, or producers with a concern for a co-operative action planned to solve general problems. Globalization is not a universal term that holds all humanities actual or hypothetically. On the contrary, McGrew (1992) defines globalization in terms of interlinking and combining the different societies and national states to make the modern world system. McGrew further explains that globalization is a process through which various activities, functions, events, and decisions in one part of the world have caused significant consequences to other people and societies of the world. Cerny (1997) indicates that globalization evaluates the relationship between territoriality and authority.

According to the aforementioned study, globalization is a shifting authority from the level of the state to the international and sub national units. Lawrence (1996) argues emphatically that globalization explicitly moves authority to the regional and local levels. Cerny (1997) defines globalization as a set of economic and political structures and processes derived from the changing character of the goods and assets that comprise the international political economy in particular and the increasing structural differentiation of these goods and assets. According to Stiglitz (2003;2007), globalization is the process and procedure through which the goods and services, human capital and capital move from one part of the world to another part of the world.

2.4.2.2 Characteristics of Globalization

On the basis of the existing literature, Ruiz Estrada (2009) identifies three characteristics of globalization.

(a) ***Institutional and political reforms***

The first characteristic of globalization is institutional and political reforms. The main idea of these reforms is to reduce the share of the public-sector participation in economic activities. The argument in favor of the reduction of public sector participation is to avoid unnecessary bureaucracy, which is one of the causes of misallocation of resources. Public-sector enterprises can be privatized, thus improving the productivity and efficiency of the public sector. After the Second World War, a new period of reforms was created in the economic, political, and institutional areas. Gaspar (2000) argues that a new institutional world order has been organized on the basis of profound political, technological, social, and economic challenges. Hveem (2000) and Sideri (2000) report that the globalization process is incomplete without analyzing the post-Cold War regionalization process and international order.

(b) ***Development of information communication technology***

Ruiz Estrada (2009) determines that the second characteristic of globalization is the development of information communication technologies (ICT). These tools emerged as a result of the use of advanced technologies. The main innovative tools of the ICT sector include Internet services (Web), sophisticated hardware and software, cellular cellphone systems, and satellite TV. New research and development techniques are developed with the use of advanced technology, and thus an expansion of the world's goods and services has occurred. Although, the advantages of technological advancement are solely enjoyed by developed economies, undeveloped countries still rely on advanced economies for their technology requirements.

(c) ***Trade liberalization***

The third and final characteristic of globalization identified by Ruiz Estrada (2009) is the expansion of regional integration agreements in the world. These agreements are based on custom union (CU) and free trade area (FTA) schemes. According to Irwin (1998), trade liberalization means that no tariff trade barriers exist among nations in the exchange of goods and services. Prices in the domestic and international markets are the same. Breton, Scott, and Sinclair (1997) identify the difference between FTA and CU. According to their study, in the case of FTA, the participant countries have no internal tariff barriers but can set external tariff barriers separately. In the case of a CU agreement, the member economies have a common trade policy.

2.4.2.3 History of Globalization

Harlan and Rahschulte (2011) divides the history of globalization into three stages.

(a) ***First Stage of Globalization***

In the first stage of globalization, the main routes of global business were sea and land. A trade was established through the finding of new lands and natural resources. The tools

used for production were expensive, and funding for searches of production was sponsored by rich people. The rich segment of the people included kingdoms and developed states, the church, and the elite group of people. An individual to conduct a business in the first stage of globalization, power, courage, resilience, and a bit of luck were needed. The first stage of globalization had several obstacles, but the main hurdle in the economic and business environment was moving because of religious pressures. Several barriers were placed by the church. At that time, the church was the strongest governing body of most states, and limitations, restrictions, and other types of obstacles were made at every stage of business against free economic interest with some serious issues (Tawney, 1926).

By the end of the 16th century, the gap between religion and economic realities was apparent. With the upsurge of Puritanism, trade was raised up to a place of honor. Although religion was not considered a significant threat to the business compared with at the early stage, culture was required to preserve business and commerce in a spiritual way.

In the early decade of the 17th century, far-reaching events occurred in the history of globalization. Some English Puritans did not follow the Church of England in 1620, and they sailed on the Mayflower to a landfall known as Plymouth. These people remained in this location and made a colony; this place is now the current state of Massachusetts. Initially, these separatist groups from England were pilgrims, and the rebel groups were followed by other English citizens who also made societies. The early explorers permanently lived in the new area and developed links between the colonies and Europe through commerce and trade. By the end of the first stage of globalization, the main center of economic growth was the United States (Britannica, 2009).

(b) ***Second Stage of Globalization***

In the 19th–20th century, the technological advancements in transportation, machinery, and communication were the changing historical factors at the second stage of globalization. These technological advancements served as the foundation for a technological expansion that emerged in the rest of the 19th and 20th centuries (Robertson, 1992). The main difference between the first and second stages of globalization was that the contributors to world enterprises made a shift. Heidegger (1950) predicts current issues about globalization and highlighted great possibilities for communication and information technologies. These factors greatly extend the opportunity of Web-based authenticity.

Scheuerman (2006) determines that the early stage of the 1950s indicated that high-speed technology would become the main source of different references in a knowledgeable life from the 1950s to the eradication of distance. Many social theorists moved beyond the compression issue and considered a link of globalization to de-territorializing by the end of the second stage of globalization. This development is supported by Ruggie (1993) and Scholte (1996), who explain that globalization extends new ways toward a border less society.

(c) ***Third Stage of Globalization***

The Internet has been the transforming factor in the third stage of globalization. According to Friedman (2006), the Internet has made the world flat and horizontal, and this phenomenon involves a "web-enabled platform for multiple forms of collaboration." Moreover, technological forces have made globalization effective and efficient. These technologies have augmented the activities at national boundaries and have brought the people closer to exchange goods and services. Political forces have also played a role in globalization given that these political factors provide power and influence to resolve the barriers in commerce and trade. The role of economic forces in globalization is that these

forces connect relationships among the people and drive the world production, exchange, and consumption without national boundaries (Martinelli, Rahschulte, & Waddell, 2010; Pearce & Robinson, 2000).

2.4.2.4 Globalization: Various Views

Different views about globalization exist. When the proponents of globalization consider it beneficial for the world economy, its opponents consider it as a source of inequality. On one hand, "globalists" believe that globalization provides opportunities for open markets and private firms to work across world. Thereby contributing to economic growth and development. Globalization makes the supply of goods and services abundant, thereby decreasing the prices of goods and services caused by the competitive environment of the global market. Globalization also results in a good working environment and symmetric information as well as the possibilities for a good democratic government and improvements in human rights. Similarly, as mentioned by the Stiglitz (2003), globalization basically is the coordination of the nations and different groups of people in the world which has been achieved by the tremendous decreasing of costs of goods and services by using relative cheaper inputs from other countries, and the decomposition of the manmade barriers to the products, capital, information, and individuals over the globe. Procedure of globalization is mainly based on the international trade and interest of individuals in the form of economic values. The advanced economies, for example, the United States of America (U.S.A) and so on have contended that by doing international trade, the developing and least developing economies such as in Africa and Asia would come out from the vicious circle by achieving better economic growth. These nations further justify the favor of globalization by arguing that the third world economies will not achieve the high standard of living without adopting the policies of globalization.

On the other hand, "anti-globalists" believe that globalization disturbs the local environments and emerging economies. Globalization interferes in the culture and sovereignty of the states of a nation, and the local culture of a nation is at risk. Anti-globalists criticize the power of international institutions, particularly the World Trade Organization, the World Bank, and the International Monetary Fund (IMF). Stiglitz (2003) has criticized the IMF strategies which turned out badly for the poor nations during the time of liberalization, globalization and privatization. Critics of globalization further argue that these international institutions and organizations push developing economies into a debt burden, thereby creating the global financial crisis (Batterson & Weidenbaum, 2001).

2.4.2.5 Globalization and Terrorism: Islamic View

Muslim scholars consider that the concept of globalization is as old as human history. These scholars argue that at present, globalization is at its peak of development (Hanafi & Azm, 2000). If we look at globalization from the historical perspective of Muslims, then the history of globalization can be traced back to the Greek civilization. From 356 BC to 323 BC, Alexander the Great attempted to extend his empire boundaries to neighboring countries and forced the norms and values of Hellenistic civilization on the inhabitants of the Mediterranean region. Later, the Romans replaced the Greek, and their civilization became based on Greek culture and Christianity. The Romans established themselves because of these developments. This spreading of the Romans generated a conflict with the Persians, and their dispute dominated the world politics at that time. In 7th century, the Muslims entered as a new political force (Zalloum, 2003).

The idea of Islam as a religion from the beginning is based on universal and global thoughts. Various proofs, which exist in the holy Qur'an, clearly define that Islam is not limited to a specific group or region, and it addresses and represents the humanity of all races irrespective of their wealth and color (Quran, 7/157: 34/28). Islam indicates that all

humans are equal, and no discrimination exists among them in front of God. A hadith and a quote from Prophet Muhammad (P.B.U.H.) further strengthen the preceding statement about Islam in the global perspective that Islam is a universal religion. According to the Prophet (P.B.U.H.), an Arab and a non-Arab have no difference; the difference lies only in the obedience of Allah. A great Muslim civilization based on the fundamentals of Islam existed between the 7th and 13th centuries. In the 13th century, Muslim civilization was spread to the subcontinent and Africa. Evidence proves that a Muslim kingdom existed in Malay-Indonesia and that the Muslims reached China (i.e., the religion of Islam). Islam is a complete code of life and guidance for all Muslims. The following is a quote from Shaw (1936) of the Muslim civilization and Prophet Muhammad (P.B.U.H.): "*the faith of Muhammad (P.B.U.H.) would be acceptable to the Europe of tomorrow as it is beginning to be acceptable to the Europe of today.*"

However, during the 17th century, Islamic civilization lost its global dominance and dynamics. Instead, industries spread across the world with the help of the new power of science and knowledge of the European civilization. At the same time, Japan made progress in industrialization, and the word "Western" became inappropriate. Later in the 20th century, the world was divided into developed and developing or slightly developing parts. Based on poverty, backwardness, and weakness, the term "third-world countries" was introduced, and Muslim countries was placed under this category excluding Western countries and Russia. This political distribution marked the end of the golden era of globalization of Muslim world. The new phase of globalization started when Europe intervened in Muslim countries. Europeans controlled the natural resources, made colonies in Muslim countries, changed the Sharia laws with secular ones, and maintained security as the least priority in the majority of Muslim areas.

In the first phase of the 19th and 20th centuries, Western countries attacked the third-world countries and implemented their own political, economic, and cultural norms and

values on them. In the second phase, the Cold War occurred between two super powers. The third-world countries of Afghanistan, Korea, Vietnam, and Palestine were victimized because of this tension and conflict. The defeat of the Soviet Union resulted in the shift of the bipolar concentration of one political force, and this concentration was controlled by the United States. This scenario generated the "New World Order." The third phase of globalization began with this New World Order. At this stage, the main political leader was the United States, which imposed its values on the rest of the world.

The young generation of the Muslim world is divided into three groups in the post globalization period. The first group comprises those who obtained education in the West and are impressed by the achievements of the Western civilization. This group believes that these western approaches should be implemented in their home countries to make their progress and development.

The second group rejects the policies of the first group and its inclination toward Western countries. The idea of this group is based on the fundamentals of Islam, and it aims to restore and implement the Sharia law in third-world Muslim countries. This group intends to overthrow the secular government in Muslim countries and believes that an Islamic government should be established in these areas in accordance with the footsteps of the early Muslim leaders. All secular Muslim leaders should be punished to achieve the objective of this group, and jihad should be announced against these secular Muslim leaders and their Western supporters. Examples of this group are the Al-Qaida and Taliban groups. The studies of Papa (2003 & 2005) and Wilson (2000) negate the idea of violence and terrorism link with religion of Islam. According to the study work of Papa in his famous book dying to win examined that 95% of all suicide attacks have a common, since 1980, which is not religion, but a specific strategic inspiration to react to a military intervention, often specifically a military occupation. The cases of terrorism from Lebanon and the West Bank in the 1980s, 90s, to Iraq and Afghanistan and up through

the Paris suicide attacks confirmed that religion has nothing to do with terrorism (see Figure 2.11). This second group of Muslims has one subgroup, which does not believe in violence and aims to achieve harmony among all people. The research work of Wilson explained the issue of terrorism free of religion in such words "They are woefully ignorant about Islam and have difficultly answering questions about Sharia law, militant jihad, and the caliphate. But a detailed or even superficial. Knowledge of is not necessarily relevant to the idea of fighting for an Islamic state, as we have seen from the Amazon order of Islam for Dummies by one British fighter bound for ISIS". This subgroup conducts verbal preaching of Islamic values to attain this objective. An example of this subgroup is Jami al Tabligh.

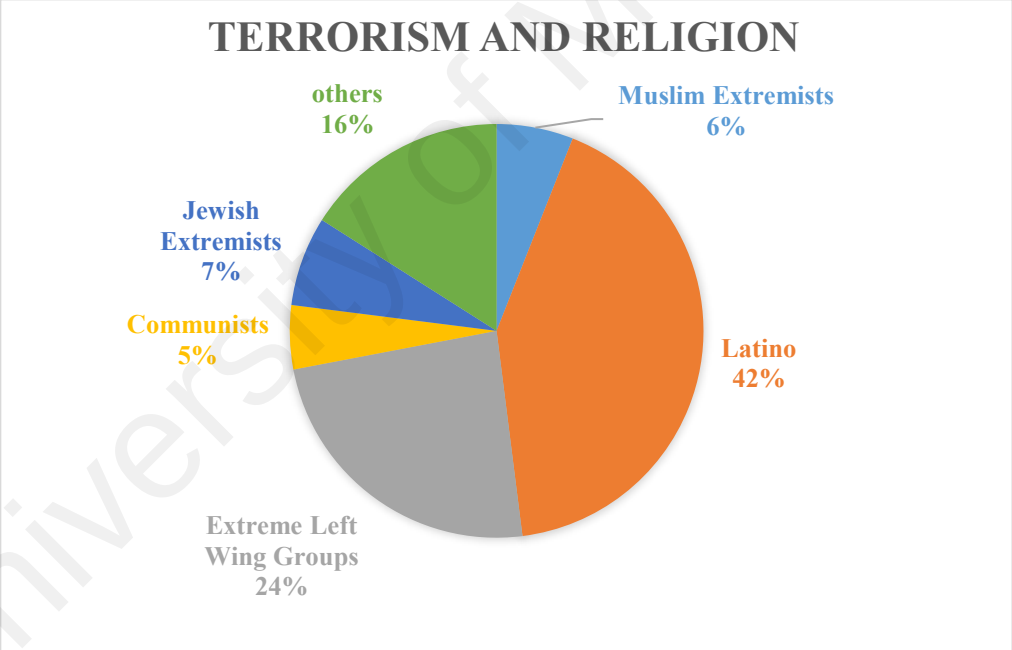

Figure 2.11: Terrorism and Religion

Source: FBI terrorism statistics

The third group appreciates some aspects of Western ideas that complement the values of the Sharia law. This group aims to bridge the gap among Islamic beliefs, institutions, and current world sociopolitical scenarios. Therefore, this group has made links through social, financial, educational, political, and charity organizations at the grassroots level in

the society and through an open competition with the government of third-world countries. This group sometimes succeeds in its objectives and has made Islamic government in some countries. Examples of this group are Iran and Sudan (Moten, 2002).

In summary, Islam is a moderate religion that fits any place at any time. Islam even teaches its followers on how to deal with non-Muslims. Islam is a religion of love and brotherhood, and it aims for the betterment of human society. It strongly condemns the killing of innocent people. The Muslim world needs flexibility to overcome the grudges between the West and third-world countries.

2.4.2.6 Is Terrorism Part of Globalization?

The issue of whether or not terrorism is part of globalization has two extreme views. Authors such as Lim (2002) argue that terrorism and globalization are not linked together. He justifies his argument by providing examples, such as Basques in Spain, Hindu Tamil Tigers in Sri Lanka, the Uighurs in Xinjiang, China, and the Sikhs and Hindu nationalists in India. Lim contends that all the aforementioned issues of terrorism in different countries occur because of local issues and not because of globalization. The world's largest terrorist attack on September 11 did not occur because of globalization. The leader of Al-Qaida, Usama Bin Laden, did not give a statement about globalization; instead, he talked about being against the US military presence in Saudi Arabia.

According to former UN Secretary-General Kofi Annan (2002), over one billion people currently live in abject poverty: "without enough food to eat, without safe water to drink, without primary schooling or health care for their children-in short, without the most basic requirements of human dignity." Poverty gives rise to forces of envy, despair, and terror. However, he does not believe that these people are victims of globalization. On the contrary, in his view, "Their problem is not that they are included in the global market, but, in most cases, that they are excluded from it."

Similarly, Stiglitz (2003) argued that globalization has not been executed properly. Liberalization policies have been adopted too fast, in the wrong direction, and often using inadequate economic analysis. As a result, the world now faces terrible consequences. The carless policies of liberations result rises in poverty and social dispute, and worldwide frustration.

Some studies have reported that globalization and terrorism have serious connections. Globalization is a significant threat to terrorism in the current scenario, and terrorism has a negative effect on globalization. On the contrary, if globalization policies are developed carefully, then globalization may be one of the effective ways to curb terrorism (Murphy, 1990, 2002).

Bockenforde (2003) argues that globalization is the combination of growth of a worldwide network and its interdependence. This study indicates that the term "globalization" is as old as human history and that the current globalization is different from the past in various perspectives. In particular, the current networks are complex, and people from many regions and different social classes interact. British sociologist Anthony Giddens determines that a misleading perception about globalization exists. This perception indicates that globalization is merely the dominance of the West over the rest of the world, but in reality, it affects the United States as much as it affects other countries. The best example of this scenario is the terrorist attack on the United States on September 11, 2001. The study of Bockenforde (2003) shows that a substantial surge in social globalization has prevailed in the last few decades. For example, the mixture of people, ideas, and culture has created new scopes of military globalization, terrorism, and humanitarian issues. Military interventions occur in different countries, such as Somalia, Bosnia, Iraq, Afghanistan, and Kosovo because of humanitarian problems. Extremist responses to modern culture are related to technology to generate new alternatives to terrorism and uneven warfare.

The worldwide expansion of the Al-Qaeda network is a prominent example of social globalization causing terrorist military globalization. This global terrorist organization is believed to operate in more than 60 countries. Bin Laden, the Al-Qaeda leader, started a privatization of terror at a time when state sponsorship for terrorism was on the decline. He developed a strong diffuse network example of which had never been seen in history. This global diffuse network has been useful to al Qaeda not only for financing their activities but also for other functions, such as the recruitment of insurgents, broadcasting, and faking of key travel documents, such as passports and visas, in other parts of the globe.

Through the widespread advancement in technology, globalization has helped to nurture slightly powerful groups (e.g., Al-Qaida and a number of other terrorist squads). The use of superior technology by Al-Qaeda to hijack planes for the 9/11 attacks raises the concern that terrorists can use catastrophic technology, such as weapons of mass destruction, to perform their attacks. Globalization has augmented the risk of the proliferation of nuclear, chemical, and biological weapons throughout the world. Moreover, Gurr, (2005) reported that globalization also helps in the settlement of the minority groups in the new area and provides a new pathway for terrorist groups. The theme of globalization is also based on the movement of workers across the globe and refugees across borders. This will be prompting to new minority groups in developed countries, many of which are connected politically to relate somewhere else. Simultaneously, the powers of globalization that is ranges from social media to communication network turn out to be generated soft corners for the newly arrived people in the other part of the world and also provides alternative ways and tactics for the international terrorist groups. They become vulnerable to new ideologies that become the driver for new types of political organizations.

Thus, the negative and positive aspects of globalization must be differentiated. The prominent negative consequences of globalization, such as the spread of terrorist networks, disease, and environmental pollution, can be identified. However, economists have long debated on the pros and cons of free trade, capital movements, and foreign direct investment. Some economists have explicated the harmful effects of globalization and have argued that the trade benefits of globalization have been highly asymmetric given that only a small number of developing countries have managed to increase their trade substantially. The same countries have also captured a considerable portion of FDI. For example, according to the World Bank study, 24 countries that are low-income globalizers and home to 3 billion people have observed a share increase in trade-to-GDP ratio in the last 20 years. These countries mainly include Argentina, China, Brazil, India, and the Philippines. The growth rate of these countries has also been improved over the period of time, and their GDP per capita increased by an average of 5% per annum during the 1990s (compared with 2% in rich countries). By contrast, several countries with a population of 2 billion people have become slightly globalized. For example, Pakistan and most African nations have observed a declining trend in their growth with an increase in widespread poverty. The per capita income of these countries fell by nearly 1% per annum in the 1990s according to a World Bank report.

This situation is so apparent that Bockenforde (2003) argues that "worldwide networks of interdependence" have substantially increased, thickened, and become complicated since the 9/11 terrorist attack. The author also illuminates the issues to combat terrorism, namely, immigration and refugee policy, international treaties, human rights, the UN, courts and tribunals to try terrorists, the financing of terrorism, the use of force, and terrorist organizations and state sponsors of terrorists. The subject of homeland security, particularly in the United States, is considered essential but new. On the contrary, this subject is an old issue in European countries, and these countries have been fighting about

this subject for a long period. Although the focus of such a concept is domestic protection against terrorist attacks, the exchange of information among countries can enhance the prospects for protection among nations.

The United States and other member states of the world community must seriously look into Israeli and Palestinian to subdue terrorism given that the intensity of this issue increases at a huge pace. Settling the Palestine–Israel relationship can intensify terrorism by anti-Israel groups in a short period of time. However, in the long run, this relationship can subdue the implicit support of terrorist groups, such as al Qaeda, because of resentment against the United States.

In summary, globalization can be the catalyst for equitable growth, development, and increase in the standard of living to further the participation of developing countries. The accountability toward the issues of developing nations, particularly trade with the developed world, is highly significant in global poverty alleviation and an equitable globalization. Although globalization has spread dramatically, terrorism has also become a global phenomenon after the 9/11 incident. Globalization is not directly involved in spreading terrorism, but instead it provides ground and condition which are favorable for doing terrorism activities like ease of gathering of the same mind people from different regions, financing of fund, and nourishing terrorist actions. In the case of 'weak globalizers' creates poor economic conditions, political discomfort and ethnic disputes. This makes conditions suitable and conducive for the crime, conflicts and terrorism. The current scenario in many Muslim countries explain that previously from the last two decades, they have become deglobalized. Due to de-globalization, the Muslim world faces more political uncertainty and growth of sectarian terrorism. Additionally, globalization also a threat to the local culture. Global markets compel many people to change their local practices and habits according to the global fashion. Then different nationalist and religious groups come together to fight against this global change to

protect their culture, norms and values from foreign impact. Whether terrorism spreads, because of globalization or because of terrorist groups, which are composed of deprived and exploitative people who are excluded from globalization, is an issue subject to further thought. Terrorism can be a cause and consequence in itself.

2.5 Theoretical Link between Terrorism and Economic Performance

In the economic context, the main objective of terrorist groups is economic destabilization. This short-run objective is achieved by terrorist activities in different forms, such as assassinations, suicide attacks, hijacking, kidnapping, and bombings; the long-run political and economic objectives include the redistribution of resources and shares in the political setup (Gries, Krieger, & Meierrieks, 2011). Collier (1999) presents the different ways through which civil war affects economic performance. The idea of Collier can be also applicable to terrorism, which is considered another type of violence. The effects of conflict on the economy are human and capital loss, high transaction costs, reduced savings, high risk and uncertainty, capital flight and brain drain, increased insecurity, and shift of resources from developmental sectors to the non-developmental defense expenditure because of terrorist attacks. Scholars such as Eckstein and Tsiddon (2004), Naor (2006), and Mirza and Verdier (2008) also provide a theoretical basis and explained how terrorism negatively affects economic performance.

Various channels exist through which the targeted economy can be affected by terrorism. The economic costs of terrorism include the diversion of FDI, capital loss, transfer of resources from developmental expenditure to the security sector, and reduction of international trade. The work of Sanders and Enders (2008) emphasizes that the effect of FDI loss in a developing country is threatening because FDI is the main source of savings; consequently, economic growth shrinks. This capital flight from terrorist-

affected economies is the same as the effect of civil war (Collier et al., 2003; Sandler & Enders, 2008).

Terrorism may affect the whole region where the targeted economy is geographically located. This scenario is similar to civil conflicts, and it may generate spillover costs to neighboring countries. A terrorist campaign in a neighboring economy dampens capital inflows. This regional multiplier results in lost economic activities in terrorism-affected economies and affects the whole region. Drakos (2004) and Ito and Lee (2005) determine that terrorism affects the whole economy and, in some cases, specific sectors (e.g., the decline in the profit of airlines and the reduction in the number of tourists after the 9/11 incident). Other economic cost of terrorism is the increase in security expenditure. For example, after the 9/11 attack in the United States, a large amount of the budget was spent on the Department of Homeland Security). In 2015, about 54% of the US budget, which was equal to US$ 598 billion, was allotted to military expenditure (Enders & Sandler, 2006).

Terrorism also increases the cost of doing business and trade because of the increase in insurance premium, expenditure on the purchase of security equipment, and increase in the salaries of employees who are exposed to risks.

The economic impact of terrorism is also related to the size of the GDP and the diversification of the economic sectors. The US Department of State Fact Sheet (2002) determines that the shipping sector of Yemen was seriously affected by the terrorist attacks on the USS Cole and MV Limburg. The competitive advantage is shifted to Djibouti and Oman because of these terrorist attacks. Insurance premium increased by 300% in Yemen. The average per month loss to the shipping industry of Yemen was $3.8 million. This type of economic cost has drastic effects on economies whose GDP is minimal because the affected sectors have a significant share in the GDP. People lose

their jobs because terrorism has a significant effect on countries with slightly developed economies compared with countries with significantly developed economies.

Compared with slightly diversified economies, the diversified and advanced economies are slightly affected by terrorism because the temporary effect shifts resources from the affected sector to another sector. The problem of slightly diversified economies is that their resources are concentrated in a few sectors. If terrorism affects these few sectors, then the whole economy will come under the influence of terrorism. The other issue of the slightly developed economies is that their exports are concentrated in a few goods. If these few goods sectors are targeted by terrorists, then the foreign exchange earnings will become negatively affected and the alternative to boost other sectors of the economy will become limited.

Meierrieks and Gries (2012) explain the causal link from the direction of terrorism on the economy. The hypothetical statement of the study is that terrorism leads to the reduction of economic performance, and it can be explained with the help of rational choice theory. Rational choice theory is defined as "an economic principle that assumes that individuals always make prudent and logical decisions that provide them with the greatest benefit or satisfaction and that are in their highest self-interest."

In criminology, rational choice theory assumes a utilitarian faith that humans are reasoning actors who weigh the means and ends and the costs and benefits, and makes a rational choice. This method was developed by Cornish and Clarke (1987) to contribute in investigating situational crime anticipation. Two economic agents exist: the government and a terrorist group. From a rational perspective, the government can weigh the pros and cons of the terrorists' demands and determines whether to accept the terrorists' demand or to bear the consequences of the terrorist attacks (Enders & Enders, 2008). Economic losses occur because terrorism shows that rejecting the terrorists'

demands from the government side and the opportunity cost of conducting the terrorist attack are less than accepting the demands of a terrorist group.

Blomberg, Hess, and Weerapana (2004) identify two main organized groups in the economy: the government and insurgents. Both groups have their own objectives. The government wants to add resources to the economy at a seed rate, in which the insurgent groups cut the resources from the economy. The insurgent group has two options when it is not satisfied with the current situation of the economy. In the first option, it chooses rebellion attacks against the government and aims to take over the government. If the group is successful in this effort, it then obtains the productive resources of the economy and rearranges the rules and structure of the economy according to its aims and objectives. The second option for the insurgent group is to establish terrorist attacks. These terrorist attacks are not adequately power to take over the government, but they present an indication to the government that they are dissatisfied with the current scenario. The actual difference between a terrorist attack and a rebellion attack is that the main goal of the former does not show any interest and involvement in the fiscal assets of the economy but merely pressures the government to set the direction and to change the rules, policies, and the economy according the goals of an insurgent group. Between these two options, insurgents aim to select and maintain the current situation. This scenario can occur only in the case in which the cost of a terrorist or a rebellion attack is comparatively high to achieve the objectives of insurgents and terrorist groups. The initial preference of an insurgent group for an attack is not to become the status quo.

However, in case the current circumstances provide more favorable and fruitful results than a rebellion or a terrorist attack (i.e., economic growth is not growing well or the government is not performing well), then establishing a rebellion or terrorist attack is comparatively costly relative to the price of pursuing the status quo at a specific time in the coming days. In this type of situation, an attack, either a rebellion or a terrorist one, is

possible from the insurgent group. A rebellion attack is an attempt to control and defeat the government. Thus, for an insurgent group, a terrorist attack is easier to perform than a rebellion attack. The possible outcome of a successful rebellion attack is that the government is controlled and the economy is captured. In the case of a successful terrorist attack, the aim is not to control the government but to obtain power to influence the policies and rules of the economy. Rational choice theory suggests that the attack of an insurgent or terrorist group is pronounced and possible only when the benefits of the outcome are greater than the cost of doing the attack. This observation explains that politically instable economies with low economic performance and high government taxes have an increased possibility of having a high number of rebellion and terrorist attacks.

Economic theory claims that terrorists are rational people (Sandler & Enders, 2004) who judge the costs and benefits of terrorism activities and choose terrorism actions according to their judgement. Opportunity costs of terror matter because of the presumed rationality of terrorists. As expected, terrorists watch the opportunity cost closely because of their supposed rationality. They will measure and choose a terrorist act if the opportunity cost is less than the economic activity. They will forgo a terrorist act if the opportunity cost is higher than the economic activities (Freytag, Krüger, Meierrieks, & Schneider, 2009). When economic growth is high, the opportunity cost of terrorism is high and the incidence of violence decreases. By contrast, if an economic downturn exists, the opportunity cost of terrorism will be low and the incidence of disturbance and violence will increase (Blomberg, Hess, & Orphanides, 2004).

Similarly, Gupta et al. (2004) examine the effect of armed conflict and terrorism on economic performance in the form of fiscal budget. They also determine that terrorism and arm conflict reduces tax collection, and that the composition of public spending becomes disturbed. The decline in economic performance due to terrorism can generate

minimal tax revenue. Economic downturns caused by insecurity and violence can lead to a decline in tax revenues. Defense expenditures typically increase because of terrorism and conflict, and they remain high even after the end of violence and terrorism issues. The increase in spending on defense and security indicates that minimal resources are available to develop expenditure sectors, such as education, health, and other developmental projects. Human capital loss, destruction of infrastructure, reduction of the international trade, tourism, increased uncertainty, and reduced business confidence also occurs because of terrorism and conflict. All these factors reduce fiscal revenue and automatically decrease the economic growth and performance of the economy.

On the contrary, Lai, Shieh, and Chang (2002) show two possible effects, namely, positive and negative, of defense expenditures on the economic growth rate. In previous studies, only the negative aspects of defense expenditure on economic growth caused by terrorism were examined. The negative effect of defense expenditure on economic growth is that the crowding out effect exists because of the increase in defense expenditures. Other economic sectors, such as private investment and public spending on the other sectors of the economy, have minimal available resources. These sectors, which are negatively affected because of the crowding out effect of defense expenditures, have a positive and strong effect on the economic performance of the economy. The positive effect on growth caused by defense expenditures occurs because of the increase in defense spending. Internal and external security are also improved because savings and investments are flourished and FDI is drawn.

2.6 Empirical Studies on Terrorism and Economic Performance

Sandler and Enders (2008) identify various channels through which terrorism affects developed and developing countries. The consequences of terrorism in developed countries are different from those in developing countries. The authors stated that government institutes are powerful in developed countries, and they can recover quickly

from any terrorist attack. The monetary and fiscal stimuli after terrorist attacks is better in developed countries than in developing countries. Markets in developed countries respond well to handling risks in terrorism-related changes. The other difference between developed countries and developing countries is that developed countries can take effective and efficient security measures for terrorism to reinstate the confidence of consumers and producers. On the contrary, most developing countries decrease the use of resources to recover quickly from terrorism shocks. The cause of developing economies for doing so is that they depend on the resources of developed countries. They are also more vulnerable than advanced economies. The markets of developing economies are slightly diversified and are easily affected by specific terrorist attacks. The internal conflict in developing countries is high, thus further resonating terrorism and pushing the number of terrorist attacks. This scenario is not the case in developed countries.

The literature presents three main groups of studies on the relationship between economic growth rate and terrorism. The first group of scholars' reports that economic performance can reduce terrorism and rebellion attacks. For example, the study of Blomberg, Hess, and Orphanides (2004) on 130 economies finds that a low economic growth rate is correlated with a high number of terrorist attacks.

Freytag et al. (2009) also confirm that good economic performance can reduce incidents of terrorism. The authors examined the causes of economics in their work "The Origins of Terrorism: Cross-country Estimates of Socio-economic Determinants of Terrorism." They use a negative binomial regression model for panel data and analyze data for 110 countries. The dependent variable of the study is the number of terrorism incidents, and the independent variables are real GDP per capita, consumption component of the real GDP, trade openness, and level of investment and rate of economic growth. The control variables of the study are democracy, regime stability, government size,

population size, civil war, religion, international war, and military spending. The results confirm that the variables representing the socioeconomic condition of a country are related to terrorist activity. The authors further explain that the high levels of consumption, trade openness, and investment (all of which indicate good socioeconomic conditions) is nearly always negatively correlated with terrorist activity in statistically robust ways. The findings of the study suggest that the improvements in the socioeconomic situation of a country (e.g., good economic performance and increased economic integration) can assist in increasing the opportunity cost of terrorism, thereby making terrorism unlikely.

Caruso and Schneider (2011) find that high macroeconomic variables, such as economic growth rate, unemployment, and inflation, are related to terrorism incidents. The view of the second group of scholars is different from that of the first group as it indicates that economic growth can generate terrorism. For example, Gries, Krieger, and Meierrieks (2011) and Shahbaz (2013) confirm the view of the second group.

Gries et al. (2011) examine seven Western European countries through time series data. The authors perform a Granger causality test for economic growth and domestic terrorism. The results of this study demonstrate that economic growth Granger causes terrorism in the economies of Germany, Portugal, and Spain. Shahbaz (2013) conducts a study entitled "Linkages between Inflation, Economic Growth and Terrorism in Pakistan." The study period is from 1971 to 2010, and the autoregressive distributed lag (ARDL) bounds and rolling window approach was used for analysis. The variables of the study are inflation, economic growth, and terrorist attacks. The results of the study indicate that bidirectional causality exists between inflation and terrorism. Moreover, economic growth is Granger caused by terrorism and inflation.

The third group of scholars determines that economic performance and terrorism are not related. Piazza (2006) examines whether the poor economic performance of the economy is a factor of terrorism. The author examines the cross-sectional data of 96 countries and determines that economic performance and terrorist attacks have no statistically significant relationship. Drakos and Gofas (2006) develop a statistical model for international terrorism and economic performance for a pooled panel data. The area of research study consists of 139 countries, and the time period is from 1985 to 1998. The results indicate that, empirically, international terrorism and economic growth rate have no relationship.

Taken together, these three schools of thought portray mixed effects of terrorism on economic performance. Although some claim that terrorism has a highly negative influence on growth, others refute it. The contradictory results of these three groups necessitate a re look at the effect of terrorism on economic performance from a novel angle. The following section briefly delineates the terrorism and growth paradox in developed and developing countries.

2.7 Effects of Terrorism on Economic Growth; Developed Countries

In developed countries, the heap of scholastic work has undertaken the task of analyzing the terrorism–growth paradox. For example, Meierrieks and Gries (2012) examine the relationship between terrorism and economic performance in 18 Latin American economies. The main variables of the study are the total number terrorism attacks and real GDP per capita, and the control variables are political instability and military spending. The study period is from 1970 to 2007. The panel Granger causality technique is used in the analysis. The results confirm that terrorism has no causal effect on the economic growth of the highly-developed countries of Latin America. This study concludes that economic growth and terrorism have no causal link in highly developed countries in this region.

Similarly, Gries, Krieger, and Meierrieks (2011) test the causal linkage between domestic terrorism and economic growth in seven western European countries, namely, France, Germany, Greece, Italy, Portugal, Spain, and the United Kingdom. The authors use time series data from 1951 to 2004 in the analysis. Hsiao (1979, 1982) uses the Granger causality technique to examine the causality between terrorism and economic growth. The main variables of the study are real GDP per capita and domestic terrorism, and trade openness is the control variable. The findings show that economic growth leads to terrorist violence in all countries of the study, and terrorism causality affects the economic growth of only one economy, namely, Portugal. The author presents some future study directions. In particular, this relationship should include other parts of the world, such as the Middle East, a specific period, a specific kind of terrorism, and certain targeted aims, such as particular citizens.

Blomberg, Hess, and Weerapana (2004) examine the relationship between economic conditions and terrorism in the case of 130 countries. The authors use panel data from 1968 to 1991. The economic variables of the study are GDP per capita and investment. The static model of Grossman (1991) and the dynamic model of Tornell (1998) are applied for the analysis. The results confirm that economic activities and terrorism are interdependent. Moreover, high-income countries have high chances of incidences of terrorist activities. The authors conclude that terrorism is linked to the business cycle and period of poor economic performance, and that it increases the possibility of terrorist activities.

Similarly, Blomberg, Hess, and Orphanides (2004) find that terrorism has a small and insignificant effect on economic growth in OECD-developed economies. The authors reveal that internal conflicts have more drastic effects than external shocks in OECD countries.

In summary, the preceding studies conclude that no clear link exists between terrorism and economic growth in developed countries. Some studies have determined that poor economic performance is responsible for terrorism in developed economies (Gries, Krieger, & Meierrieks, 2011). Other studies have explained that terrorism and economic growth have no link in developed economies (Meierrieks & Gries, 2012). Researchers such as Blomberg, Hess, and Orphanides (2004) determine that a weak link exists between terrorism and economic growth in advanced economies.

2.8 Effects of Terrorism on Economic Growth; Developing Countries

Despite the importance of the topic, empirical studies analyzing the link between terrorism and economic performance are limited in LDCs. Nevertheless, some scholars have considered this issue, for example, Hussain (2003) with his study entitled "Terrorism, Development, and Democracy: The Case of Pakistan." The author identifies some causes of terrorism from historical studies on the Pakistan economy and argues that if we want to make Pakistan a moderate and modern Muslim country, then Pakistan should eradicate poverty and illiteracy to overcome the terrorism issue. The author presents two main causes of terrorism in the Pakistan economy one is illiteracy and the second is poor economic condition of the general public.

From another angle, Blomberg, Hess, and Orphanides (2004) examine the macroeconomic consequences of terrorism in Africa, Asia, and Middle East countries. The authors select GDP per capita, economic growth, trade openness, and Gini coefficient as the economic variables. They determine statistically that terrorism has a strong but economically low negative effect on economic growth. The effect of terrorism in non-democratic and African countries is significant. These economies are significantly affected possibly because of severe internal conflict, which has created external conflict and terrorism. The results also explain that internal and external conflicts, such as wars,

have a more significant effect on economic growth than on terrorism. A strong public policy is recommended to mitigate all possible risks related to terrorism.

Furthermore, Feridun and Sezgin (2008) investigate the relationship between regional underdevelopment and terrorism in Turkey. The dependent variable of this study is terrorism binary index. The authors assign a value of 1 to the index if at least one terrorist event occurs in a particular month. The sample areas from which terrorism information is collected include 11 cities from the South-Eastern Turkey. The independent variables are GDP and its component agriculture, government expenditure, trade, manufacturing, construction, industry, and transportation. Logit model is used to estimate the parameters. The results of the study indicate that a link exists between GDP and its components and terrorism events. This study confirms that the poor economic performance is responsible for terrorism in the southeastern part of Turkey.

Öcal and Yildirim (2010) investigate the relationship between terrorism and economic growth in their work entitled "Regional Effects of Terrorism on Economic Growth in Turkey." The authors use a geographically weighted regression approach to estimate the parameters of the variables. The advantage of this technique over others is that this model shows the relationship among variables that change in space by launching distance-based weights to estimate the parameters for each variable and geographical location. Other models disregard the socioeconomic condition of the countries excluded by conducting a cross-country analysis. The study period is from 1987 to 2007. The empirical results of the study show the negative association between economic growth and terrorism in Turkey. This study explains that terrorism negatively affects the economic growth of Turkey. The southeastern part of Turkey is more affected by terrorism than the eastern and western areas of Turkey because many terrorist activities occur in the south-eastern part of the country.

Meierrieks and Gries (2012) take a different approach and examine the relationship between terrorism and economic performance in 18 Latin American economies. The findings reveal that economic growth reduces terrorism in slightly developing countries in Latin America. However, terrorism has no causal effect on the economic growth of these developing countries (i.e., Guatemala and Ecuador) in Latin America. Moreover, the findings indicate that economic growth can cause terrorism, but terrorism cannot cause economic growth in the slightly developing countries in Latin America.

Shahbaz, Shabbir, Malik, and Wolters (2013) apply the conventional ARDL techniques and conclude that terrorism and economic growth have a long-run relationship. They examine the causal relationship between economic growth and terrorism in Pakistan. The study period is from 1973 to 2010. The ARDL model approach is used in this study. The variables are real GDP per capita, number of terrorist attacks, real stock per capita, and real trade per capita. The results of the study show that a unidirectional causation exists from economic growth to terrorism. These observations indicate that economic growth is the main factor for terrorism in Pakistan. A bidirectional relationship exists in the case of the relationship between capital and terrorism and that between trade openness and capital. This finding indicates that terrorism can cause capital and trade openness, and that capital and trade openness can cause terrorism. Moreover, inequality is generated because of economic growth income, and this inequality has further generated terrorism in Pakistan.

Similarly, Sultan (2013) argues that terrorism has cost the economy of Pakistan. The author determines that the real income of the Pakistan economy experienced a 33.02% reduction, which is approximately 1% of the real GDP per capita annually, because of terrorism. The author uses data from 1973 to 2010. Different time series techniques are used, such as Quasi, structural vector autoregression (VAR), vector error correction model, impulse response function, and Granger causality tests. This study has two

advantages: it is free from the heterogeneity bias issue that prevails in cross-country analysis and it differentiates short-run from long-run analysis.

The conclusions drawn from the link between terrorism and economic growth in developing countries are mixed. Some studies have determined that economic growth is accountable for terrorism in developing countries (Feridun and Sezgin, 2008, Meierrieks & Gries, 2012, Shahbaz, Shabbir, Malik, and Wolters, 2013). Others have found that the direction of the link is from terrorism to economic growth in developing countries. These studies explain that terrorism is the main obstacle in the way of economic growth in developing economies (Gupta, Clements, Bhattacharya, & Chakravarti, 2004; Öcal & Yildirim, 2010; Sultan, 2013).

2.9 Methodologies and Techniques to Analyze Terrorists

After reviewing the extant literature on the conception of economics and terrorism, we divided this topic into following key areas:

2.9.1 Measurement of Terrorist Activities

The first step in analyzing the economic impact of terrorism is to gauge precisely the extent and magnitude of terrorism. Thus, far, a limited number of datasets have been used in the literature to measure terrorist activities. These studies have several built-in flaws. For example, most studies have provided the number of terrorist events, which have been widely used in the literature. Prominent studies in this area include those by Mickolus (1980, 1982), Mickolus and Fleming (2003), and Mickolus, Sandler, Murdock, & Fleming (1989, 1993). These studies use a dataset from the International Policy Institute for Counter-Terrorism in (2003).

Similarly, another dataset is used for individual and sectoral information. This dataset focuses on the primary data collected by the researchers themselves. The simple count of events may not explicate the actual phenomenon of terrorism. Knowing the indirect and

psychological costs of terrorism is pertinent. The number of actual attacks is highly unpredictable over time and cross country analysis because of the occasional and extreme nature of terrorist events (Enders and Sandler, 2002). Rich countries are frequent targets of terrorism (Blomberg et al., 2004; Enders and Sandler, 2002). Tavares (2004) examines if the count of terrorist activity is true or if it's per capita is appropriate. The link of democracy to terrorism is not clear given that some scholars believe that democracy matters (Blomberg et al. 2004), whereas some believe that it does not matter (Tavares, 2004). Blomberg and Hess (2006) use bilateral data to examine this issue. The advanced, open, and democratic economies are apparently disposed to be targeted. Krueger and Laitin (2007) report that terrorism can occur in slightly developed, non-democratic, and closed economies. The measurement of terrorist activity explains two areas for research to support the study of the individual and total costs of terrorism and the effectiveness of different counter-terrorism policy measures. The type and nature of attacks should be documented with regard to the number of events, type of target, type of organization, number of fatalities and injuries, direct monetary cost of attacks, and type of media coverage either social media, electronic media or printed media. The objective of measuring the primary level of terrorist activity, as opposed to terror events, is an important direction to examine the individual utility and economic costs of terrorism (Llussa & Tavares, 2011).

2.9.2 Behavior and Motivations of Terrorists

The rise of terrorist groups and the incidence of terrorist attacks can be explained in several ways, which range from individual or group incentives to a second set that observes how macroeconomic variables link with the frequency of terrorism events. Both ways deliver vital understandings. Overall, known individual motivations of terrorists to join terrorist groups are against the existing prejudices that view terrorists as irrational persons with living standards such as low education and low income level. However,

Krueger & Maleckova (2003); Berrebi (2007); Schelling (1991) examine that these conclusions are extremely dangerous at the current level of research because the available literature proposes that the support for and the participation in terrorist acts are not related to low literacy rate or poor economic condition. The occurrence of suicide actors dramatically necessitates non-traditional explanations for terrorism (Wintrobe, 2006, 2007). Kydd and Walter (2002) determine how a minority of terrorist extremists may "rationally" delay a truce between the government and the majority of their own camp that desires peace, given that violent actions destabilize the trust between the majorities of population who are supporting peace on both sides of the issue. Siqueira (2005) explains how the presence of different groups may actually decrease rather than increase terror activity. As argued in Laitin and Shapiro (2007), the nature, magnitude, and occurrence of terrorist activities depend on the nature and development stage of government institutions, the political stability within the target economy, the number of terrorist organizations groups, the sources and magnitude of financing, and the counter-terrorist strategies. These authors propose a series of hypotheses on the political, economic, and organizational determinants of terrorism, which are derived from the "rationalist" point of view that concludes that terrorists behave like rational individuals reacting to incentives. Similarly, Laitin and Shapiro (2007) suggest that organizations with dwindling support or with strong support but no political voice tends to adopt terrorism as an approach, particularly in democratic economies. Several studies have viewed terrorism as the result of modernization. For example, Crenshaw (1981), Aziz (1995), and Crenshaw (2005) find that the beginning of the new millennium, during which modernism advanced, gave rise to religious fundamentalism. Terrorism may be emerged from other types of political disputes over resource distribution among different groups within one country (Garfinkel, 2004; Blomberg et al., 2004; Sambanis, 2007). In the case of transitional terrorism, a foreign policy can be applied as an instrument in foreign policy

calamities (O'Brien, 1996). Glaeser (2005) and Charney and Yakatan (2005) reveal that people hatred toward particular sects can develop from miscommunication and exaggeration by political leaders, who can increase the number of followers' loyalty by encouraging, crime violence and terrorist attacks (Epstein & Gang, 2004).

2.9.3 Utility Cost of Terrorism

The general perception on terrorism shows that any type of terrorism has a negative impact on individual economic life as well as on the whole economy. Even though, their effects are extremely unpredictable and uncertain. Terrorism carries costs related to the "non-rational" evaluation of risk on the part of people, namely, a decline in satisfaction that goes beyond the expected measurement of losses (Becker & Rubinstein, 2004; Sunstein, 2003). Despite the non-rational nature of terrorists, their perceived costs can be quite significant (Viscusi & Zeckhauser, 2003). The aforementioned studies suggest that people's evaluation of terrorism cost has several anomalies. Frey, Luechinger and Stutzer (2004) recommend that people's utility losses from terrorism are underestimated and the actual expected consequences are more than the observed one.

2.9.4 Macroeconomic Impacts of Terrorism

A large number of literatures on the economics of terrorism have concentrated on the impacts of terrorist incidents on the macro economy, particularly on the output side. Hobijn (2002), IMF (2001), Navarro and Aron (2001), and Treverton, Justin, James, Arindam, Susan, Everingham and Eric (2007) report that the direct cost to output is apparently very few and relatively small. Terrorist attacks decrease economic performance although its effect is measured to be less than that of crime, domestic conflict and external war or even natural disasters (Blomberg et al., 2004; Tavares, 2004). However, Eckstein and Tsiddon (2004), Abadie and Gardeazabal (2003), and World Bank (2002, 2003) determine that the high intensity of terrorism in a specific area has a significant effect. Blomberg et al. (2004) and Sandler and Enders (2008) find that the

terrorism effect on poor countries is significantly higher than that of developed economies. This finding is also endorsed by the World Bank's (2002, 2003) studies on Israel versus Palestine territories. Large and diversified economies tend to suffer less than other types of economies.

2.9.5 Microeconomic Consequences of Terrorism

The literature on economics suggests that terrorism is linked to significant effects on various economic sectors. As expected, severe but temporally limited shock affects consumption differently through a consumption-smoothing mechanism and investment, which may decrease further other areas, such as consumption and public spending. Noticeable decreases are observed in of consumers with respect to consumption following terrorism incidents (Eckstein & Tsiddon, 2004; David, 2002). The terrorism action decreases in investment **(**Eckstein & Tsiddon, 2004, Blomberg, et al., 2004; Fielding, 2003). Capital flows and international trade flow across borders also tend to cut (Abadie & Gardeazabal, 2005; Enders & Sandler, 1996; Walkenhorst & Dihel, 2002; Nitsch & Schumacher, 2004). Tourism and airline demand clearly show a negative effect on tourism and airline demand because of their explicit vulnerability to terrorism incidents and to the variations in consumer behavior (Konstantinos and Kutan, 2003; Enders et al., 1992; Enders & Sandler, 1991, 1996; Sloboda, 2003; Fleischer & Buccola, 2002; Drakos, 2004; Ito & Lee, 2004).

2.9.6 Terrorism and its Impact on Economic Policy

Terrorist attacks can affect fiscal and monetary policies. Terrorism has unexpected shocks that would need response from economic policy. Lenain, Bonturi & Koen (2002), Gupta et al. (2004), and Hobijn (2002) determine that additional security in the case of terrorism will require more public spending. Similarly, Eichenbaum and Fisher (2004) and Wildasin (2002) find that terrorism has a minimal effect on the budget deficit.

2.9.7 The Role of Policy Modeling in Terrorism Studies

After the 9/11 terrorist attacks, a bulk of researchers have developed and applied game theory models to explain the scenarios of the outcome of terrorist attacks. For the better counter terrorism measures, the researchers such as Cauley and Iksoon (1988), and Landes (1978) examine the security measures at airport to reduce hijacking incidents of terrorism. Similarly, studies of Enders and Sandler (1993;1995), and Sandler and Enders (2004) cover the other type of terrorism such as assassination, bombing and kidnapping and their substitution effect of airport security.

2.9.8 Counter Terrorism Policy

According to evidence, terrorists substitute between means and targets across time. Iksoon, Cauley and Sandler (1987) substitute military and governmental goals with tourists over time. This ability on the part of terrorists proposes the practice of multiple measures rather than a single specific anti-terrorist measure (Enders & Sandler, 2004; Frey, 2004). Furthermore, Frey (2004) and Ethan (2005) argue that deterrence is the key reply of governments to terrorist groups, but it may not be the appropriate tactic because it influences escalation and a negative sum game interaction. Ethan (2007) maintains that the observability of explicit counter-terrorism actions and insights of voters may clarify such prejudice. However, Peter and Sandler (2004) contend that proactive policies may also be unjustified and may encourage "dramatic" terrorist attacks either domestically or internationally. Further, economic sanctions may be unsuccessful. Valpy (2004) suggests that an important mechanism to control terrorism is the number of measures to control the financing of terrorism. Frey and Luechinger (2003, 2004) and Frey (2004) contend that the other counter-terrorism measures that should be painstaking include reducing the benefits or increasing the opportunity cost instead of the material cost of terrorism incidents. Evidence shows that individuals comprehend the complexity of terrorism and

that people are prepared for more adjustable policy comebacks (Theodore & Hoffman, 1993).

2.10 Empirical Framework

The following conceptual framework is illustrated in view of the research questions, objectives and theoretical base of study in the literature.

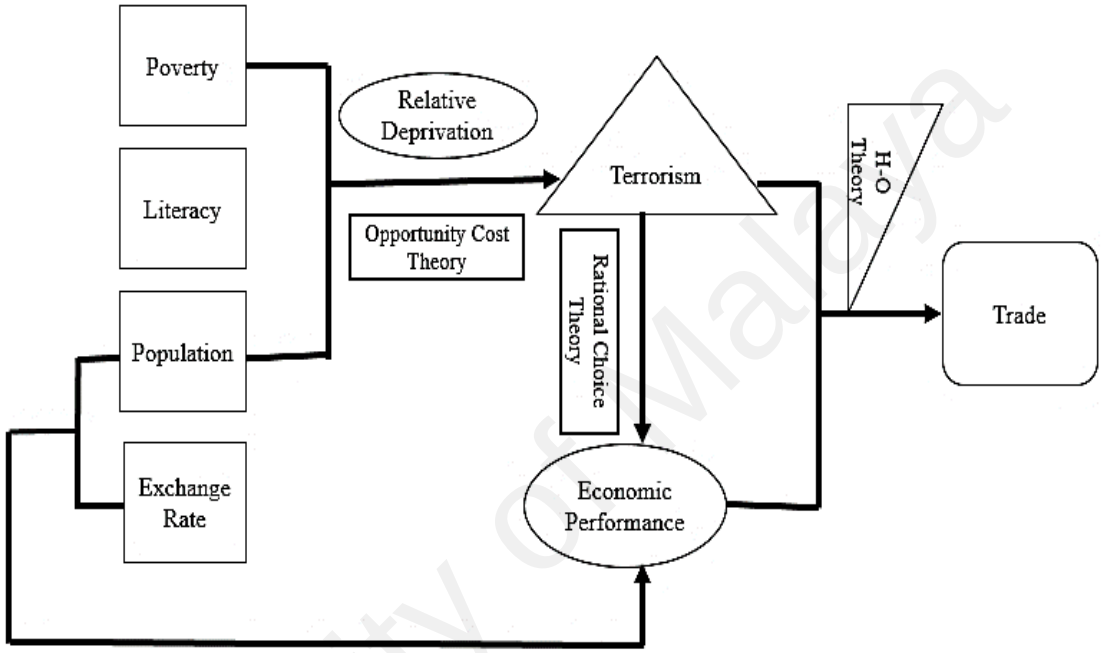

Figure 2.12: Empirical Framework

The literature reports that poverty causes terrorism. For example, Shahbaz (2013), Shahbaz et al. (2013), and Burgoon (2006) state that poverty can cause terrorism. However, most studies on terrorism are based on cost–benefit analysis, static equilibrium, and conventional methodologies. However, it remains a matter of concern that there is few research based model designed for economic impact of terrorism evaluation. Despite the sizable economic causes and consequences of terrorism, works in the field of modeling of the economics of terrorism are relatively few. This study is different as it will construct alternative indicators to analyze the economic impact of terrorism in a dynamic way taking into account on more measures of terrorism. The diagram of the conceptual framework exhibits the link between poverty and terrorism. Along with the

poverty headcount ratio, population and literacy rate as a matter of concern that affect terrorism. Thus, based on the aforementioned works, population and literacy are considered as the control variables to test the relationship between poverty and terrorism.

In general, terrorism has been measured with four indicators, namely, incidents of terrorism, number of deaths in terrorist attacks, number of injuries in terrorist attacks, and capital damage in terrorist attacks. These indicators are used to measure the economic cost of terrorism and terrorism intensity at a province level in an economy. Terrorism can also affect economic performance and economic desgrowth (as an indicator that can show different leakages that is originated from controlled and non-controlled events that can affect the performance of the final GDP formation into a period of one year) has been applied to measure the leakages from the economic growth rate (Ruiz Estrada, Yap, & Park, 2014). Along with the impact of terrorism on economic GDP growth, the effect of terrorism on international trade has been examined and evaluated in this research work. The conceptual framework evaluates the cause of terrorism; and the effect of terrorism on economic performance and international trade (see Figure 2.12).

2.11 Summary

This chapter summarizes the previous studies related to the definition of terrorism, profile of terrorism in Muslim countries (Pakistan, Afghanistan, Iraq and Syria), terrorist group ISIS, effect of terrorism on the migration of the Syrian people to Europe. The statistics of terrorism across the global confirm that after the post 9/11 the intensity of terrorism has been observed more in the Islamic countries as compared to the rest of the world. Furthermore, the literature of globalization and terrorism conclude that it is still not clear whether terrorism spreads, because of globalization or because of terrorist groups, which are composed of deprived and exploitative people who are excluded from globalization, is an issue subject to further thought. Terrorism can be a cause and consequence in itself. The causal linkages between terrorism and economic performance

the conclude that link between terrorism and economic performance in developing and developed countries are mixed. Some studies have determined that economic performance is accountable for terrorism in developing as well as in developed countries. This chapter provides an overview of previous studies in the field of terrorism and economic performance. The following chapters are developed on the basis of this chapter.

CHAPTER 3: DOES TERRORISM PLAY A UNIFORM ROLE AT PROVINCE LEVEL OF A COUNTRY?

3.1 Introduction

This chapter introduces the economic impact of terrorism at micro level (provincial level analysis). Terrorism is a concept that has received the attention of academics after the catastrophic 9/11 terrorist attack in the United States. Therefore, various attempts have been made to quantify the terrorism score. The literature has used different approaches to measure terrorism. For example, some scholars have used the number of terrorism incidents to measure terrorism, whereas others have applied the data of killed and injured persons as an indicator of the level of terrorism (Gries, Krieger & Meierrieks, 2011). However, these approaches have shortcomings. For example, when scholars employ terrorism incidents as a benchmark, they fail to differentiate large and small terrorism incidents based on intensity, and they consider terrorist incidents to be the same (Enders & Sandler, 2002). For example, the 9/11 World Trade Center attack is considered the same as other terrorism incidents in which only one person is killed or injured. Therefore, using a common scale for all incidents does not make sense. Such traditional approaches to measuring terrorism are useful only when the structure of terrorist events remains unchanged. These approaches use the number of killed and injured persons in a terrorism event to measure the level of terrorism (Sandler & Enders, 2002). The main problem with this approach is equating the number of killed persons to the number of injured persons. In one case, persons have lost their lives, whereas in the other case, injured persons may have survived, go back to work, and become productive persons in a society (Frey & Luechinger, 2003).

However, in the literature, a comprehensive study on terrorism measurement was conducted by the Global Terrorism Index (GTI)[2], which is developed and maintained by the Institute for Economics and Peace (IEP) in Sydney Australia. The GTD is recognized as a complete dataset of terrorism-related information and data from around the world. The GTD codified over 140,000 terrorist attacks from 1970 to 2014. It introduced the Global Terrorism Index (GTI), which evaluates the terrorism intensity and economic cost of a country at a global level (GTD, 2015 & GTI, 2015). The GTD also ranks countries' terrorism point of view based on the GTI scores. This GTI is suitable at the macro level but is unable to provide comprehensive information on the particular province of a country. For example, some states may be more affected by terrorism economically than other states in one country.

This study fills this research gap by introducing a new index called the TEIE indicator (Khan & Yusof, 2016). The proposed index is a comprehensive one that measures the terrorism intensity and economic cost of terrorism in any country at the province level and provides a realistic view of terrorism within a country in different geographical locations.

This topic is presented as the second section of this study and provides the theoretical framework. The third section includes the methodology of the TEIE index. The fourth section discusses the application of TEIE index to the Islamic countries (Pakistan, Afghanistan, Iraq and Syria). The fifth section presents the conclusion of study with some policy recommendations.

[2] 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/).

3.2 Theoretical Framework of the Study

The relationship between terrorism activities and economic performance is complex. On one hand, terrorism may be affected by economic growth rate negatively. On the other hand, a strong economic performance may improve the living standard of the public and generate less terrorism. Terrorism is considered a threat to economic performance in general. Among other non-economic factors, terrorism is one of the main aspects that generate destabilization, human capital loss, capital loss, and uncertainty. Therefore, these influencing factors are the inputs of the economic growth rate. Terrorism may be solved by increasing its opportunity costs. When the economy is growing, prospective terrorist groups have extra economic alternatives such as jobs, employment opportunities, and reduction in poverty and relative deprivation, and this effect further increases the opportunity costs of terrorism (Frey & Luechinger, 2003).

Economic theory postulates that terrorist activities lead to poor economic performance. The justification of terrorists in destabilizing the economy can be explained by rational choice theory. A government attacked by terrorists may take on a rational perspective, and it compares the cost of accepting the terrorists' demands against the cost of prolonging the terrorists' campaign, which results from the continuous resistance of the government (Sandler & Enders, 2008). Thus, destabilization is a main objective of terrorists. Poor economic performance caused by terrorism means that accepting terrorists' demands is relatively less costly from the government's perspective. Terrorism is anticipated to destabilize the economy by imposing direct costs and by performing actions that result in poor economic performance. The direct costs include loss of human capital, property, and infrastructure. The indirect costs come from the response of economic actors to terrorism. Security measures may be taken because of terrorism, thus increasing transportation costs and the obstacles in international trade (Khan & Yusof, 2015). Resources are shifted from the productive sector to the non-developmental

expenditures such as defense, and the economic performance of the economy further deteriorates as a result. The economic theory called immiserizing modernization theory indicates that economic performance and terrorism have a two-way link if the benefits of economic prosperity cannot be moved through a trickle- down outcome to the poor people of the economy. Poor economic performance boosts income inequality, and therefore poverty triumphs over the economy. The surge at the level of poverty reduces the opportunity cost of terrorism, thus encouraging the poor common people to pursue terrorism and other types of terrorist activities. This theory defines the economic performance and the vicious circle of terrorism (Shahbaz, 2013). According to Gurr (1970), relative deprivation is also a main cause of terrorism. When people experience relative deprivation, inequality is created and people are forced to commit suicides and other types of terrorist activity.

3.3 Introduction to the TEIE Indicator[3]

The economic theory postulates that output is depended on two main factors of production, labor (L) and capital (K). The general production function can be expressed as:

$$Q = f(L, K) \qquad (3.1)$$

When the terrorism incident or terrorist's attacks occurs, it badly affects these two factors of production in the form of human capital loss and capital. The human capital loss includes number of deaths and number of injuries in a terrorism incident and capital loss includes property damage.

The intensity of terrorism is based on the number of terrorism incidents, number of deaths, number of injuries, and property damage in a particular province for a specific

[3] Basic idea of TEIE indicator (Khan & Yusof, 2016) has been published in Quality and Quantity journal with the title "Terrorist Economic Impact Evaluation Model: The case of Pakistan".

period of time. Therefore, terrorism is mainly based on these four indicators of any terrorist attack. Three stages are involved in the measurement of the TEIE indicator (Khan & Yusof, 2016).

Two main hypotheses are tested in this study.

H0: Terrorism intensity has uniform impact at a province-level.

H1: Terrorism intensity has not uniform at a province-level.

The TEIE indicator is based on the Omnia Mobilis assumption, which explains that all relevant variables are important and should be accounted for in policy modeling. The logic of the Omnia Mobilis assumption is to cover all possible relevant variables in the study and include any relevant variable (Ruiz Estrada, 2011). The DIS is built on the application of the Omnia Mobilis assumption (Ruiz Estrada, 2011). The DIS is not chaos; it is an unconditional and unexpected complex sensitive reaction of all possible uncertain events generated by controlled and uncontrolled variables simultaneously under irregular scenarios (Ruiz Estrada and Yap, 2013). The TEIE technique applies these assumptions as terrorist actions are uncertain and cannot be predicted. Therefore, the Omnia Mobilis assumption suits the TEIE technique.

3.3.1 Stage 1: Measurement of Terrorist Attack Intensity

The intensity of any terrorist action in any area can be measured through the number of terrorism incidents, number of people killed, number of injuries, and property damage in a particular locality. The intensity of terrorist action can be expressed in functional form as follows:

$$\Re = f(\varepsilon, \kappa, \chi, \mu) \tag{3.2}$$

Where ($\Re$) is the terrorist attack action, (ε) is the number of terrorist incident, (κ) is the number of people killed in a terrorist action, (χ) is the number of injured persons in the terrorist attack, and μ is the property damage of a terrorist attack.

At this stage, weights are assigned to these four dimensions of a terrorist attack. The GTI methodology approach is used to assign weights to the number of incidents, number of deaths, number of injuries, and property damage in a particular province. These four factors of terrorist action have different intensities and magnitudes.

$$\Re = f(\ell\varepsilon + \hbar\kappa + \pi\Psi + \sigma\mu) \tag{3.3}$$

Where $\ell = 1$, $\hbar = 3$, $\pi = 0.5$, and $\sigma = 2$.

The above weights are assigned on the basis of the individual intensity of the four factors of a terrorist attack. These weights are taken from the GTI.

The equation (3.2) can be represented in matrix form as follows:

$$\Delta(\Re) = \begin{pmatrix} \partial\Re/\partial\varepsilon & \partial\Re/\partial\kappa \\ \partial\Re/\partial\Psi & \partial\Re/\partial\mu \end{pmatrix}. \tag{3.4}$$

The final value of the terrorist attack magnitude can be calculated as

$$\langle\Re\rangle = 1 - \frac{1}{\begin{pmatrix} \partial\Re/\partial\varepsilon & \partial\Re/\partial\kappa \\ \partial\Re/\partial\Psi & \partial\Re/\partial\mu \end{pmatrix}} \leq 1 \neq IR\,. \tag{3.5}$$

3.3.2 Stage 2: Terrorist Attack Intensity Growth Rate

At this stage, the terrorist attack intensity growth rates of the four dimensions of terrorist attacks are measured. This growth rate has four sub-stages.

3.3.2.1 Terrorist Attack Incident Growth Rate

The procedure for obtaining the terrorist attack incident growth rate is

$$\Delta\left(\frac{\varepsilon_0 - \varepsilon_{\min}}{\varepsilon_{\max} - \varepsilon_{\min}}\right) \geq 0 \tag{3.6}$$

Where (ε_0) is the actual number of terrorist incidents that occurred in a particular province in a particular year, ($\varepsilon_{\max}$) is the highest number of incidents among all states

during the study period, and ($\varepsilon_{\min}$) is the lowest number of terrorist incidents that occurred among all states during the study period.

3.3.2.2 Terrorist Attack Death Rate

The mathematical formula for obtaining the terrorist attack death rate is

$$\Delta\left(\frac{\kappa_0 - \kappa_{\min}}{\kappa_{\max} - \kappa_{\min}}\right) \geq 0 \qquad (3.7)$$

Where (κ) is the terrorist attacks death rate, (κ_0) is the actual number of deaths in a terrorist attack in a particular province in a particular year, ($\kappa_{\max}$) is the highest number of deaths among all states during the study period, and ($\kappa_{\min}$) is the lowest number of deaths among all states during the study period.

3.3.2.3 Terrorist Attack Injury Growth Rate

$$\Delta\left(\frac{\Psi_0 - \Psi_{\min}}{\Psi_{\max} - \Psi_{\min}}\right) \geq 0 \qquad (3.8)$$

Equation (3.8) represents the terrorist attacks injury rate (Ψ), where (Ψ_0) is the actual number of injured persons in a terrorist attack in a particular province in a particular year, ($\Psi_{\max}$) is the highest number of injured people among all states during the study period, and ($\Psi_{\min}$) is the lowest number of people injured in a terrorist attack among all states during the study period.

3.3.2.4 Terrorist Attack Property Damage Rate

The terrorist attack property damage rate is expressed as

$$\Delta\left(\frac{\mu_0 - \mu_{\min}}{\mu_{\max} - \mu_{\min}}\right) \geq 0 \qquad (3.9)$$

Where (μ) is the terrorist attack property damage rate, (μ_0) is the actual number of property damage in a particular province in a particular year, ($\mu_{\max}$) is the highest number

of property damage in among all states during the study period, and ($\mu_{\min}$) is the lowest number of property damage in a terrorist attack among all states level during the study period.

3.3.3 Stage 3

At this stage, principal component analysis (PCA) is used to assign different relative weights to the indices of the four dimensions of a terrorist attack. The PCA is a technique of abstracting data from its original position into the reduced form to show as much of the information from the observed data (Rao, 1964; Lee, Park, & Vanrolleghem, 2005). Three main steps are involved in PCA. First, the covariance matrix is calculated. Second, eigenvalue decomposition is performed on the same covariance matrix. The following equation is using to capture the variance from the data.

$$PC = \alpha_1(x_{11}) + \alpha_2(x_{12}) + \ldots\ldots\ldots\ldots\ldots\ldots + \alpha_{np}(x_p) \qquad (3.10)$$

Where, the symbol α_{np} (principal component) is the regression coefficient of the component variable. Third, the most significant component among all components is selected. By obtaining the percentage value of the contribution of components, the eigenvalue is divided by the sum of all eigenvalues.

The formula for the percentage contribution of a component is as follows:

$$\frac{\lambda_i}{\sum_{j=1}^{M} \lambda_j} \qquad (3.11)$$

There are two main advantages of the PCA technique. First it overcomes the issue of outlier of data and second it measures the underlying latent information on variables in a block. The relative weights assigned on the basis of PCA explain the relative intensities among the four terrorism dimensions' intensity rates during a particular period of time.

The final step of the methodology of TEIE index involves adding the weighted indices of the four dimensions of a terrorist attack and calculating the TEIE score for a particular year. The formula is

$$TEIE = \Phi\varepsilon + \Omega\kappa + \alpha\Psi + \lambda\mu \quad (3.12)$$

Where ($\Phi\varepsilon$), ($\Omega\kappa$), ($\alpha\Psi$), and ($\lambda\mu$) are the terrorist attack incident weight rates in a particular province in a specific period of time, terrorist attack death weight rate, terrorist attack injury weight rate, and terrorist attack property weight, respectively.

$$0 \leq TEIE \leq 1 \quad (3.13)$$

The TEIE value for a particular year ranges from 0 to 1, where 0 represents the least terrorism vulnerability of a province of a country in measuring economic cost and 1 represents the highest vulnerability of terrorism in measuring the economic cost of a province of a country.

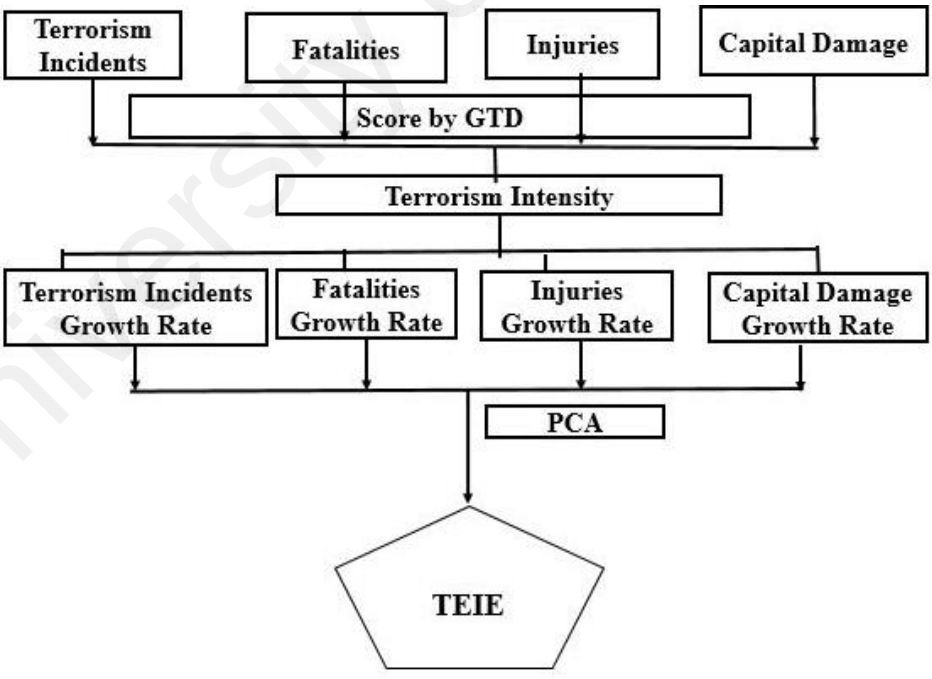

Figure 3.1: Flow Chart of TEIE Indicator

3.4 Contribution of TEIE Indicator to the Existing Literature

The first step in analyzing the economic impact of terrorism is to gauge precisely the extent and magnitude of terrorism. Thus, so far, a limited number of datasets have been used in the literature to measure terrorist activities. These studies have several built-in flaws. For example, most studies have provided the number of terrorist events, which have been widely used in the literature. Prominent studies in this area include those by Mickolus (1980, 1982), Mickolus and Fleming (2003), and Mickolus et al. (1989, 1993). These studies used a dataset from the International Policy Institute for Counter-Terrorism (2003).

Similarly, another dataset is used for individual and sectoral information. This dataset focuses on the primary data collected by the researchers themselves. The simple count of events may not explicate the actual phenomenon of terrorism. Knowing the indirect and psychological costs of terrorism is pertinent. The number of actual attacks is highly volatile over time and across countries because of the occasional and extreme nature of terrorist events (Enders and Sandler, 2002). Rich countries are frequent targets of terrorism (Blomberg et al., 2004; Enders and Sandler, 2002). Tavares (2004) examines if the count of terrorist activity is true or if its per capita is appropriate.

The main issue, which is often ignored by the present literature, is the geographical dimension of terrorism. The work of Ocal and Yildirim (2010) supports a province (state) wise analysis of terrorism as they mentioned that the geographical dispersion of terrorist incidents is uneven. For example, in the case of Turkey, the provincial effects of terrorism are more pronounced for the Eastern and South Eastern provinces compared to the western provinces. In the literature, this is the one type of such study which covers the provincial level terrorism analysis, but has introduced no formal modeling or index to gauge the intensity of terrorism at province level.

The global terrorism database (GTD) is recognized to be the most comprehensive and complete dataset on terrorism related information and data across the globe. So for from year 1970 to 2014, the GTD has codified over 140,000 terrorist incidents. It introduced the Global Terrorism Index (GTI), which evaluates the terrorism intensity at a global level (GTD, 2015 & GTI, 2015). The GTD also ranks countries' terrorism position based on the GTI scores but only provides the measurement of terrorism of a country in a calendar year. So, for the GTI has been calculated for the year 2002 to 2011. This GTI is suitable at the macro level but is unable to provide comprehensive information on the particular province (state) of a country over a period of time. For example, some states/provinces may be more affected by terrorism economically than other states in the same economy. The geographical dimension of terrorism within the country varies and as mentioned in the study of Ocal and Yildirim (2010).

The TEIE indicator introduces the concept of capturing the intensity of terrorism within one economy at different geographical positions (provinces/states). This TEIE index provides the concept and measurement of terrorism intensity variations at province level (Khan, 2017).

3.5 Application of the TEIE to Four Islamic Countries

First part of the application and results discussion is related to the economy of Pakistan, followed by Afghanistan, Syria and Iraq respectively.

Pakistan is a South Asian economy that shares its boarders with India, China, Afghanistan, and Iran. Afghanistan and Iran are located on its west boarder, India is found on its east, and the Arabian Sea on its south.

Pakistan has four states (provinces), namely, Punjab, Sindh, Khyber Pakhtunkhwa, and Balochistan. Punjab is the largest province of the country and has the highest population. The capital of Punjab is Lahore. The second province of the country is Sindh, which is

well known for its industries. Most of the industries are located in the province capital Karachi. Khyber Pakhtunkhwa is the third province of the country. Most of its population belong to the Pathan family, which is the reason for the change of the name of the province from North West Frontier Province (N.W.F.P.) to Khyber Pakhtunkhwa. The capital of the province is Peshawar, which is near the Afghanistan border. The fourth province of Pakistan is Balochistan, and it is the largest province by area. The capital of this province is Quetta.

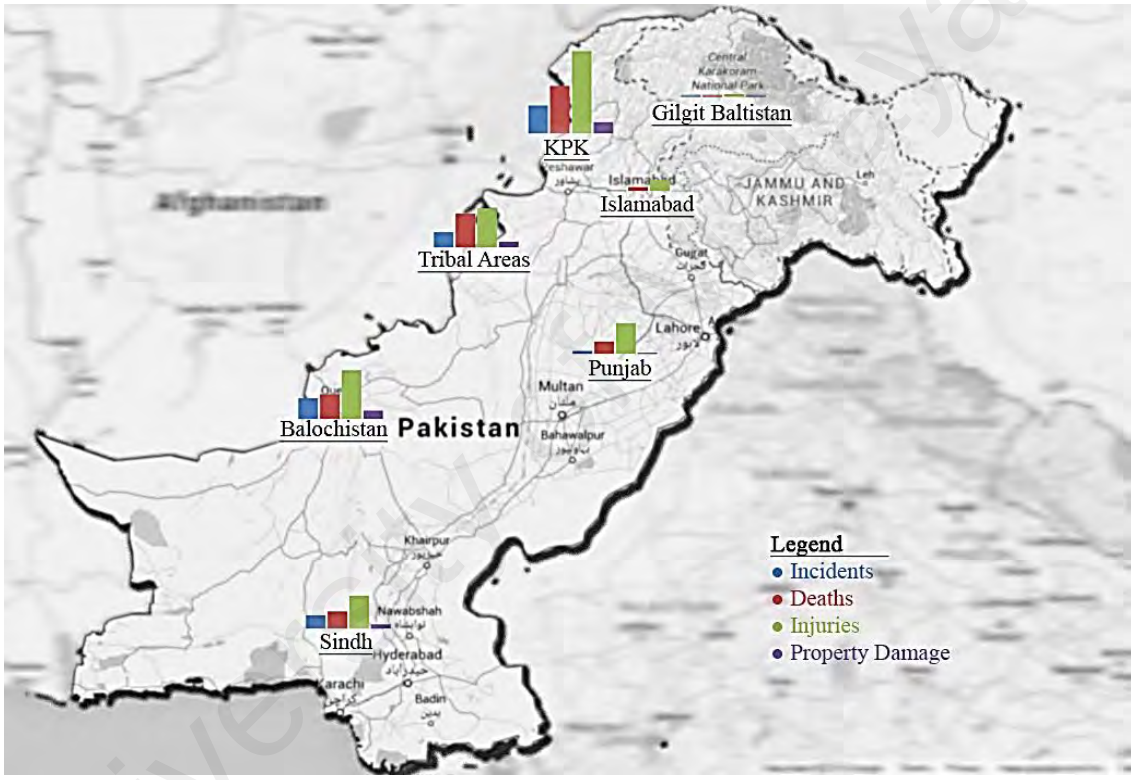

Figure 3.2: Spatial Distribution of Terrorist Attacks in Pakistan: 2002–2014

Source: Author

The following section explains the results of the TEIE indicator for the four provinces/states of Pakistan.

Table 3.1: Results of the TEIE Indicator Pakistan Provinces

Province	Average (TEIE)
KPK	0.381
Balochistan	0.242
Sindh	0.151
Punjab	0.084

Source: Author's Own Estimations

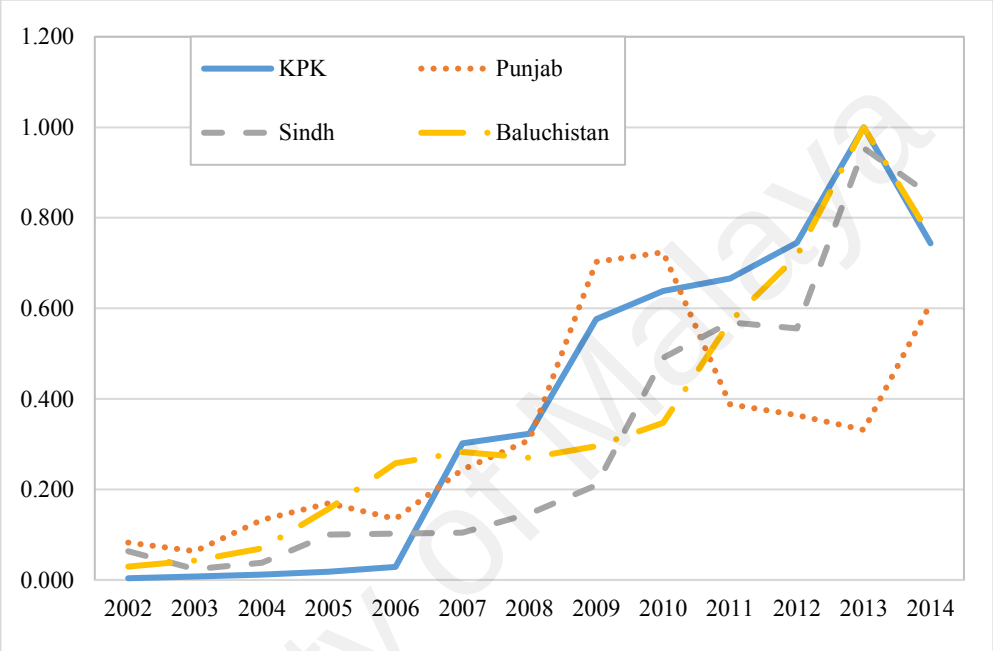

Figure 3.3: Province-wise TEIE Indicator Results Distribution

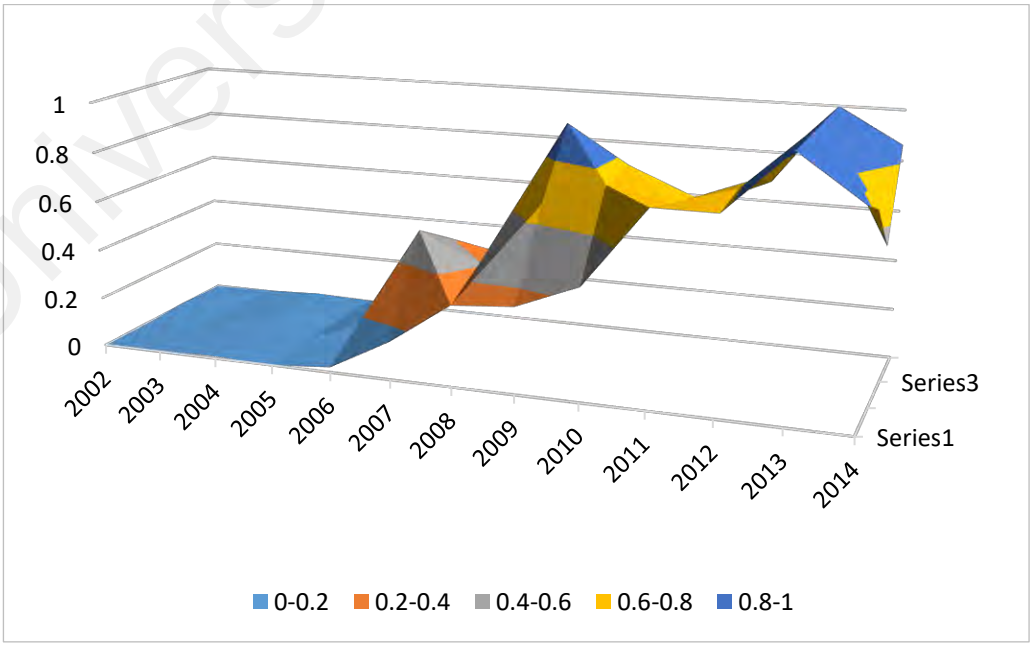

Figure 3.4: KPK Terrorist Attack Distribution: 2002–2014

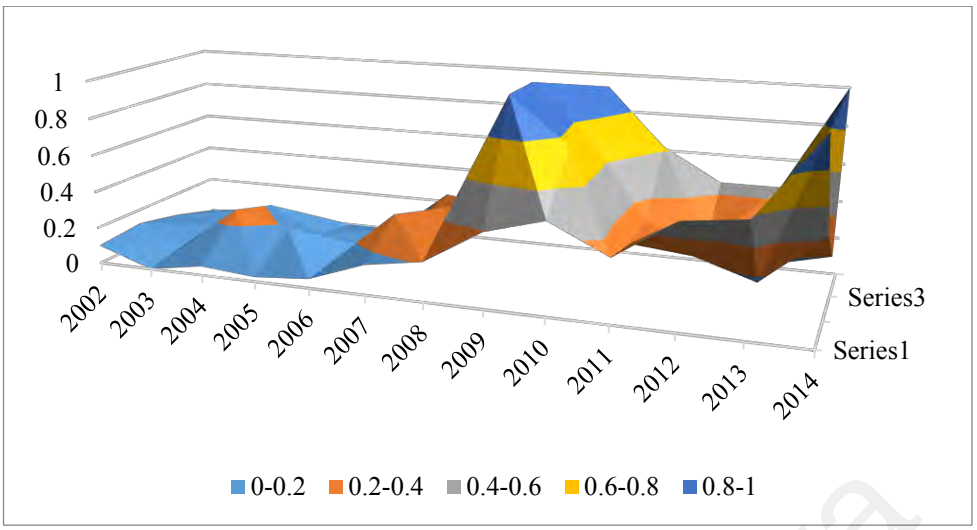

Figure 3.5: Punjab Terrorist Attack Distribution: 2002–2014

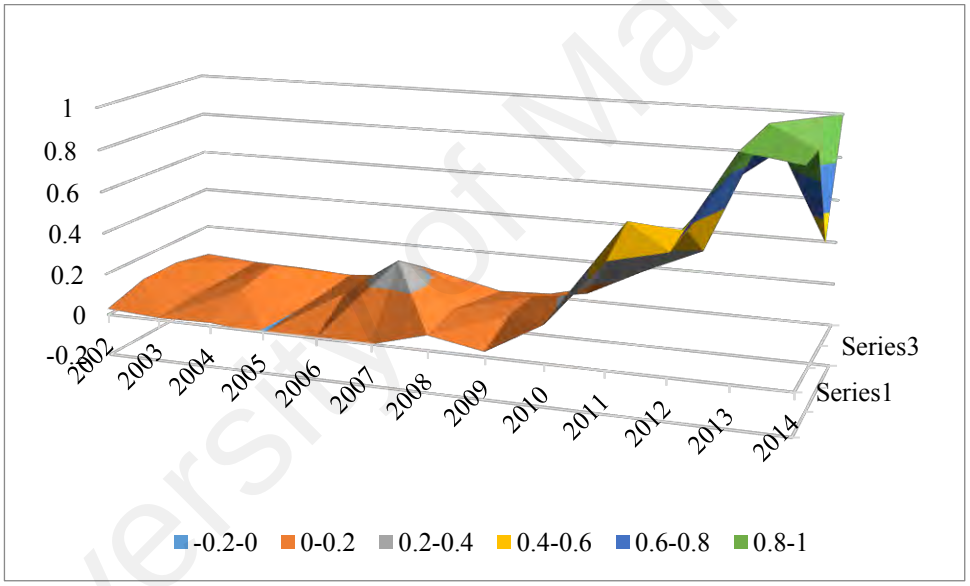

Figure 3.6: Sindh Terrorist Attack Distribution: 2002–2014

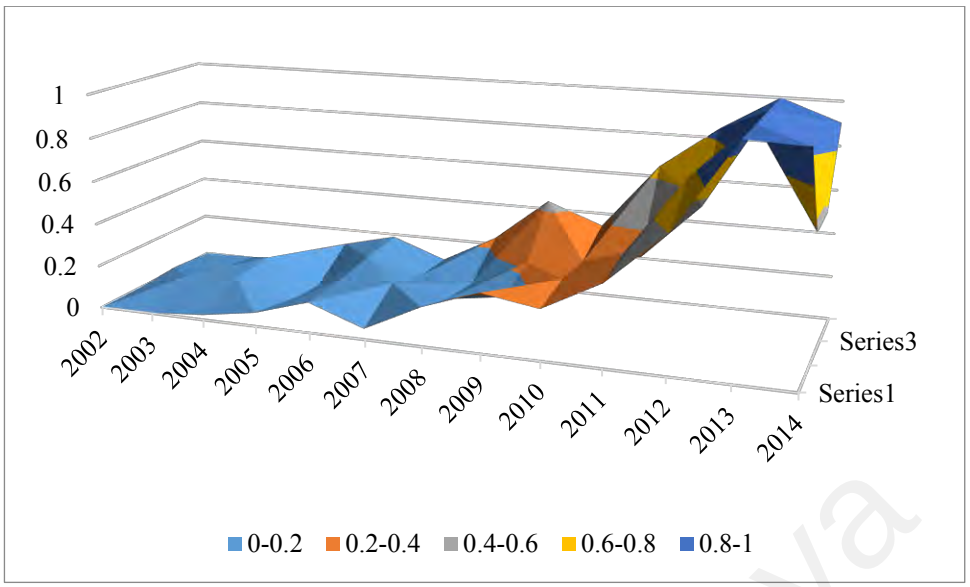

Figure 3.7: Balochistan Terrorist Attack Distribution: 2002–2014

The TEIE technique analyzes the data on terrorism in the four provinces of Pakistan from 2002 to 2014. According to the statistics on terrorism events, terrorism gained momentum after the United States' attack on Afghanistan in 2001. In the initial year of study in 2002, the results of the TEIE indicator in all provinces show that terrorism is limited in 2002 and that the economic cost is low. The values of the TEIE technique for Punjab, Sindh, KPK, and Balochistan for 2002 are 0.025, 0.045, 0.002, and 0.006, respectively. These statistics explain that in 2002, the TEIE statistics of Punjab, Sindh, KPK[4], and Balochistan are 0.25%, 0.45%, 0.2%, and 0.6%, respectively. Results of the TEIE technique for 2014 are 0.12, 0.468, 0.594, and 0.744 for Punjab, Sindh, KPK, and Balochistan, respectively. Results of the TEIE technique indicate that the terrorism intensity scores for Punjab, Sindh, KPK, and Balochistan are 12%, 46.8%, 59.4%, and 74.4%, respectively, in 2014. The estimated value of the TEIE technique for the last year of study is excessively high and confirms that terrorism activities are high among all the states of Pakistan. The results also confirm that the economic cost is high in the same

[4] We considered the Gilgit-Baltistan province as a part of KPK province: as the former province gets the provincial status after 2010, hence due to unavailability of separate data before said tenure we get estimated combinedly.

states of the economy. Although all four provinces/states are affected by terrorism, Balochistan and KPK are the most affected provinces/states of the Pakistan economy overall from 2002 to 2014, followed by Sindh and Punjab (see Figures 3.2). These results also confirm that the terrorism activities that measure economic cost are not uniform among all the provinces/states in the same country. The study of Bilgel and Karahasan (2015) for the economy of Turkey supports the TEIE analysis and confirms that economic impact of terrorism varies across the provinces of the same country. In Pakistan, some states (provinces) are more affected than others during the same period.

Similarly, in the case of Afghanistan[5], there are 34 provinces in Afghanistan divided into eight regions. The eight regions are South West, Central, West, North, South, East, North East, West Central and North Central. The South West region includes Nimroz, Helmand, Kandahar, Zabul, and Urozgan provinces. While the central region represents Kabul, Kapisa, Parwan, Wardak, Logar and Panjsher. The number of provinces in the West region includes Badghis, Herat and Farah. The north part includes Samangan, Balkh, Jawzjan, Sar-I-Pul and Farayab. The number of provinces in the South region is three which include Ghazni, Paktia and Khost (see Table 3.2 & Figure 3.8).

[5] The results of this part of chapter has been published in the Quality & Quantity Journal with title "How does terrorism measurement matter of state-level of a country? Evidence from Islamic countries" Khan (2017).

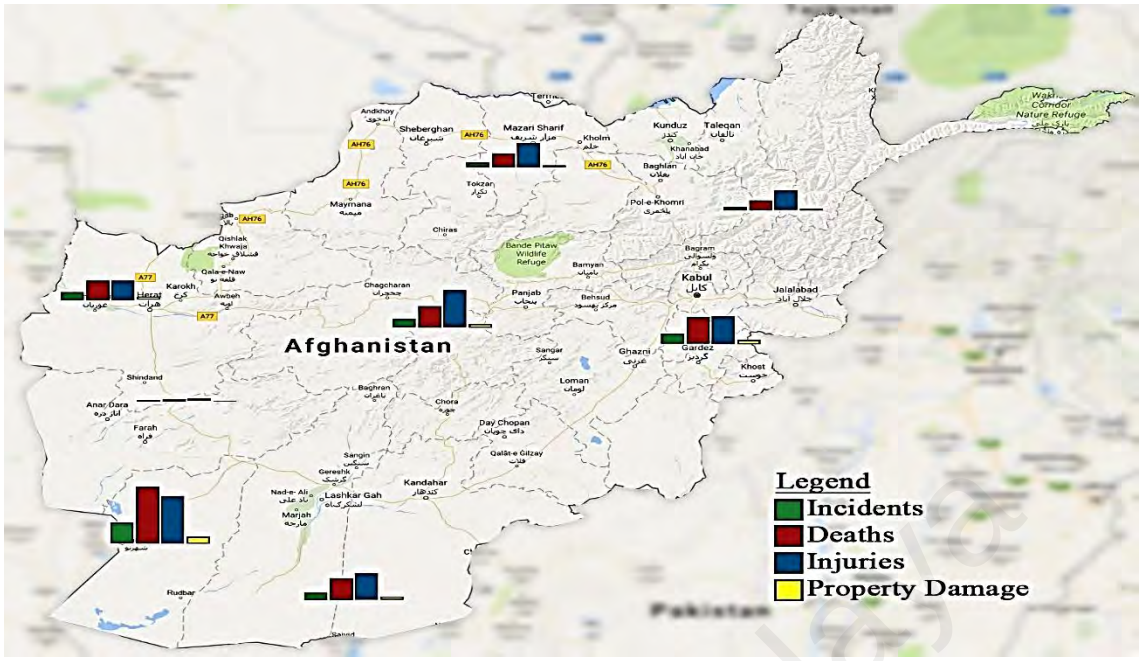

Figure 3.8: Terrorism Intensity Distribution among the Eight Regions of Afghanistan

According to the TEIE results for Afghanistan, in the South West region the highest terrorism intensity has been found for the province of Helmand (0.65) followed by Kandahar (0.56). The average value of TEIE indicator for the South West region is 0.37. The main reason for the high terrorism intensity in the provinces of South West is that this region is adjacent to the Pakistan border (tribal areas and KPK province), where most of the terrorist groups are active. In the central region, Kabul (0.402) and Wardak (0.299) provinces have been observed for the high number of terrorism intensity. Here in these provinces in the region, the Afghan Taliban hold the maximum area. Among the three provinces in the West region, most affected area is the province of Farah (0.36). The North region consists of five provinces, in which most affect province is Farayab (0.31) followed by Jawzjan (0.198). In the case of South region, the high terrorism intensity has been calculated for the province of Ghazni (0.36). Nangrhar (0.51) and Kunarh (0.304) provinces are considered as the highest terrorism intensities provinces/states in the East region according to the TEIE indicator estimated values. The seven and eight regions of Afghanistan are West Central and North East, in which the Bamyan (0.216) and Kunduz

(0.259) provinces are the high terrorism intensity provinces/states respectively. According to the TEIE technique estimation, On the average among these eight regions in Afghanistan, the high terrorism intensity region is South West where the calculated terrorism intensity is 0.37.

Table 3.2: TEIE Results of Afghanistan Provinces

Region / Province	TEIE (Province)	TEIE (Region)	Region / Province	TEIE (Province)	TEIE (Region)
South West	-	0.373	North	-	0.191
Nimroz	0.165		Samangan	0.154	
Helmand	0.650		Balkh	0.097	
Kandahar	0.565		Jawzjan	0.198	
Zabul	0.192		Sar-I-Pul	0.194	
Urozgan	0.293		Farayab	0.310	
Central	-	0.242	East	-	0.292
Kabul	0.402		Nangrhar	0.517	
Kapisa	0.172		Kunarh	0.304	
Parwan	0.164		Laghman	0.192	
Wardak	0.299		Nooristan	0.154	
Logar	0.214				
Panjsher	0.2		West Central	-	0.163
			Ghor	0.210	
West	-	0.290	Bamyan	0.216	
Badghis	0.189		Daykundi	0.065	
Herat	0.317				
Farah	0.363		North East	-	0.232
			Takhar	0.220	
South		0.302	Baghlan	0.216	
Ghazni	0.369		Kunduz	0.259	
Paktia	0.228		Badakhshan	0.150	
Khost	0.310		-		

Source: Author's Own Estimations

Table 3.3: TEIE Results of Syria Provinces

Province	TEIE average
Al Hasakah	0.128
Aleppo	0.535
As Suwayda	0.026
Damascus	0.549
Daraa	0.062
Deir ez-Zor	0.08
Hamah	0.101
Homs	0.295
Idlib	0.243
Lattakia	0.029
Quneitra	0.012
Raqqah	0.093
Rif Dimashq	0.084
Tartus	0.002

Source: Author's Own Estimations

In the case of Syria, there are 14 numbers of province in the whole country. The name of provinces in Syria is Al Hasakah, Aleppo, As Suwayda, Damascus, Daraa, Deir ez-Zor, Hamah, Homs, Idlib, Lattakia, Quneitra, Raqqah, Rif Dimashq and Tartus. The TEIE indicator explains that the highest value of terrorism index has been calculated for the province of Damascus, which is 0.549. Damascus province has the highest value of the TEIE indicator, which is the oldest capital of the world. Aleppo has the second highest value of TEIE indicator (0.535). Al Hasakah has the lower TEIE value (Khan, 2017). This province is in the control of Kurdish forces, which is not faces the issue of the Shia-Sunni conflict. Similarly, in the case of the Lattakia and Tartus provinces, the TEIE values are the lowest, and these two provinces are controlled by the government (see Table 3.3 & Figure 3.9).

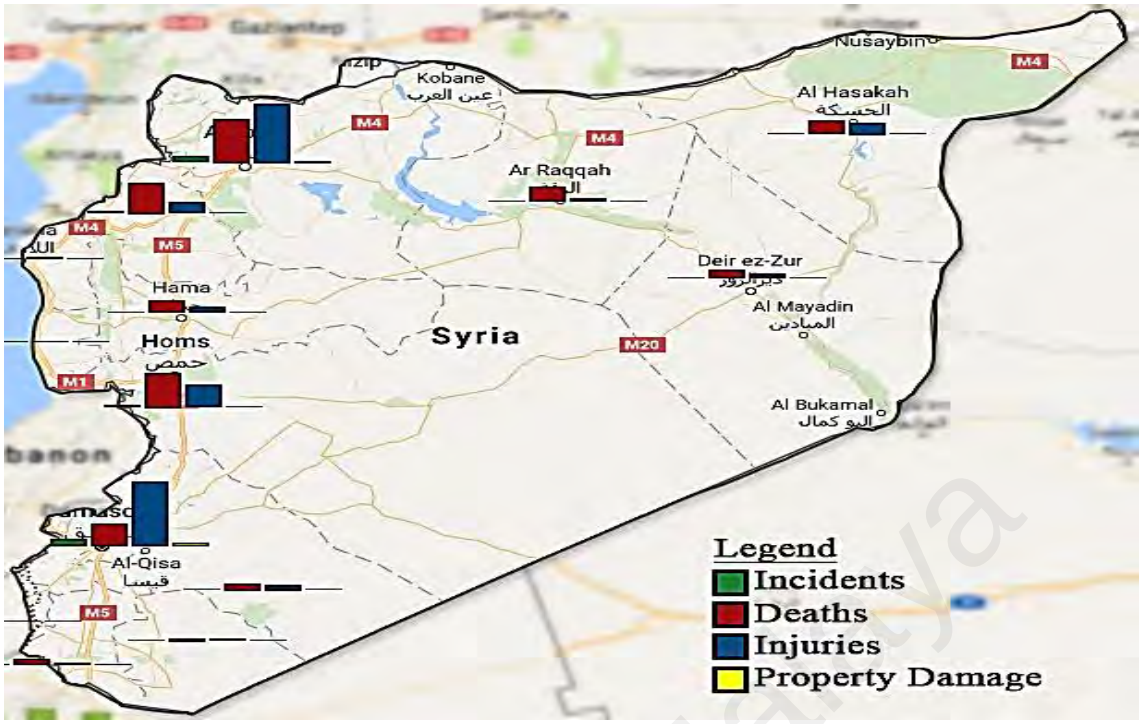

Figure 3.9: Spatial Distribution of Terrorism activities in Syria Provinces

Source: Author's Own Estimations

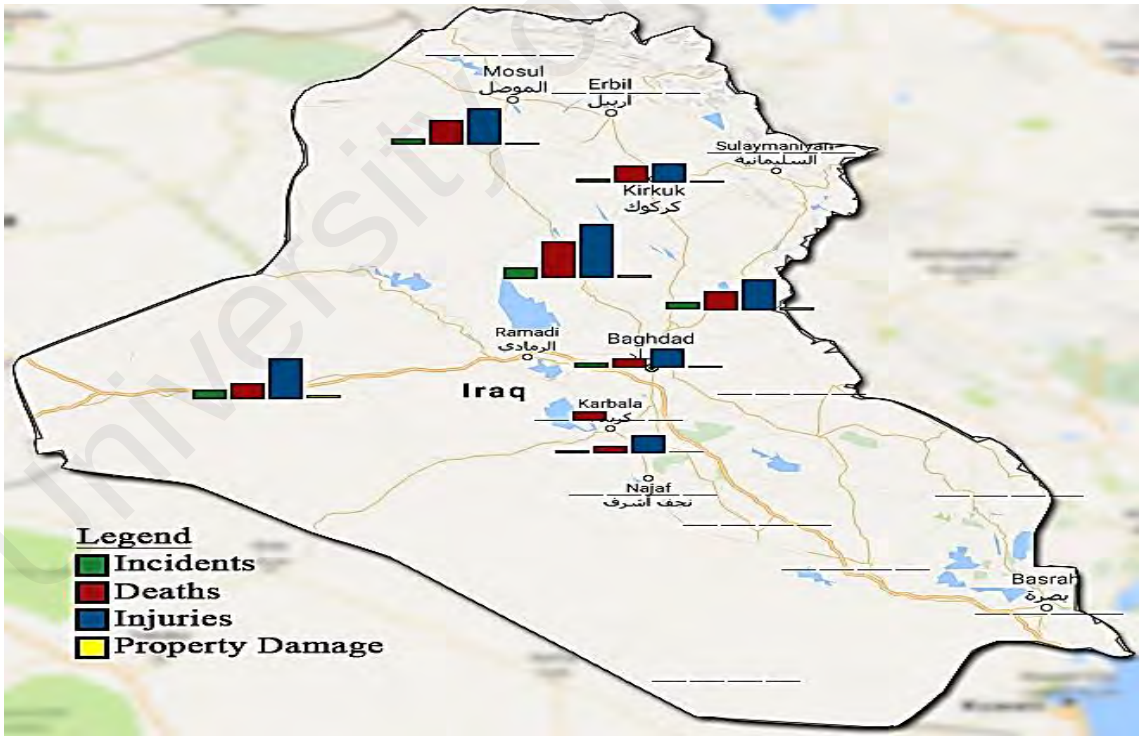

Figure 3.10: Terrorism Intensity Distribution among the Provinces of Iraq

Source: Author's Own Estimations

Table 3.4: TEIE Results of Iraq Provinces

Province	TEIE average
Al Anbar	0.384
Al Qadisiyah	0.009
Arbil	0.008
Babil	0.136
Baghdad	0.677
Basra	0.012
Dhi Qar	0.006
Dihok	0.00003
Diyala	0.348
Karbala	0.048
Kirkuk	0.229
Maysan	0.002
Muthanna	0.001
Najaf	0.003
Nineveh	0.338
Saladin	0.518
Sulaymaniyah	0.002

Source: Author's Own Estimations

In the case of Iraq, there are 18 provinces/states, namely Al Anbar, Al Qadisiyah, Arbil, Babil, Baghdad, Basra, Dhi Qar, Dihok, Diyala, Karbala, Kirkuk, Maysan, Muthanna, Najaf, Nineveh, Saladin, Sulaymaniyah, and Wasit. According the TEIE indicator results, the terrorism index value is different and changes over the geographical dimension of Iraq. Some provinces have shown high value of TEIE indicator than other provinces. For example, the highest value of TEIE is calculated for the province of Baghdad, which is 0.677, followed by Saladin 0.518, and Al Anbar 0.384. Baghdad is the capital of Iraq, so mostly the terrorism activities have been observed here. Baghdad is the center of the country and the terrorism main objective is to generate panic such a place, where the message to the rest of the country can easily be conveyed. Saladin province has the second highest TEIE indicator value (0.518). Al Anbar is the center of ISIS terrorist group and the TEIE indicator results show that this province has the third highest terrorism score (0.384). Likely, in the case of Karbala province, which is the Shia populated province has relatively higher value of TEIE indicator. Mostly, the Shia people

go there to study the Shia sect. Due to the religious importance of Karbala, the terrorist groups attack this area to get the advantage from the Shia-Sunni conflict. During the Muharam month (Islamic calendar), the terrorist attacks have been observed more in this area of the country as compare to the rest of the provinces of Iraq. The lowest value of TEIE indicator is calculated for the province of Sulaymaniyah (0.002). The main reason of the lowest terrorism measurement index score of this province is that the area of this province is controlled by Kurdish forces (Khan, 2017). Here is not Shia or Sunni in most, so the conflict of Shia-Sunni has not been cashed for the cause of terrorism (Khan, 2017) (see Table 3.4 and Figure 3.10).

3.6 Conclusion

This study develops an index to examine the province terrorism activities of an economy to measure the economic cost. The main idea of this study is to quantify the terrorism score at the province level of a country to gauge the terrorism intensity of that particular province in a particular period of time. This research provides a new concept to compare different provinces/states' terrorist attack intensities and economic costs within one country based on the logic that the economic cost of terrorism is not uniform within a country. Some areas may be more affected than others in the same territory of a country.

The results of the application of the TEIE to Islamic countries (Pakistan, Afghanistan, Iraq and Syria) provinces/states confirm that terrorism intensity used to measure economic cost is not uniform in the provinces of Islamic countries and it also confirms that geographical dimensions of terrorism are heterogeneous with in one country. Terrorism intensity and economic cost fluctuate across the provinces of the Islamic countries.

The measurement of terrorism intensity in accurately evaluating the economic cost is important because on one hand, the underestimation of terrorism intensity means that

fewer resources are allocated to the defense in curbing terrorism. On the other hand, if terrorism intensity is overestimated, then a higher budget is allocated to defense and fewer resources are available for the remaining sectors of the economy. This research does only help policymakers in the overall defense expenditure of the country but also in the defense measures of a specific province of a country. Therefore, the scarce resources are efficiently used for anti-terrorism measures. This study provides a new platform for policymakers to devise anti-terrorism policies for each province according to the intensity of terrorism. Ant-terrorism one-fit for all policy within one country is not appropriate and should be decentralized according to the magnitude of terrorism score at province level. This research can be extended to the district level and can provide more thorough results on terrorism vulnerability. The causes of terrorism in the states (provinces) of any economy can also be investigated in future studies.

CHAPTER 4: HOW DOES POVERTY LEAD TO TERRORISM?

4.1 Introduction

Thus, for the previous chapters 3 has worked on the geographical dimension of terrorism and terrorism score at provincial level. Given its importance as a measuring the terrorism intensity at province level, it is imperative to examine the major cause of terrorism especially the poverty terrorism nexus at provincial level to examine the terrorism-poverty nexus at gross root level. Many prominent leaders and academics in the world today believe that poverty is the root cause of terrorism. They think that most terrorists come from poor and impoverished families. The former UN general secretary Kofi Annan reported the effect of poverty on terrorism in such words: "Extreme poverty anywhere is a threat to human security everywhere." President George W. Bush said in his speech during a five-day UN conference on poverty in Mexico on March 22, 2002: "We fight against poverty because hope is an answer to terror. We will challenge the poverty and hopelessness and lack of education and failed states that too often allow conditions that terrorists can seize and try to turn their advantage" (White House 2002). Former British Prime Minister Tony Blair also said in his speech in 2001, "The dragon's teeth [of terrorism and terrorists] are planted in the fertile soil of poverty and deprivation" (Blair Speech, 2001).

The general belief in terrorist action indicates that individuals would be more likely involved in terrorism if the opportunity cost of terrorist actions is low. This perception implies that when the opportunity cost of terrorism is low, terrorist activities are high. These approaches and ideas can be explained by economic theory of crime (Backer, 1968) and economic theory of suicide (Hamermesh & Soss, 1974). These economic theories have a common feature: individuals are more attracted to terrorist action when the marketable options or alternatives are less. Individuals should distribute their time between working in legal and criminal activities in a manner that maximizes their utility.

Common sense may propose that people who have "nothing to lose" would will probably take part in self-destructive activities. Such conventional wisdom could follow directly from the conventional economic theory of crime or the economic theory of suicide. A typical basic component of these tactics is that terrorism should attract those which have less marketable opportunities. As such, individuals with fewer opportunities in the legal or secular world would probably commit crimes, confer suicide, or join extremist organizations. Since terrorism is often clarified through a similar rationale, the intuitive expectation is for terrorist associations to be populated with those people who have the least market opportunities.

Literature has connected the causes of terrorism to many socio-economic factors such as low income level, poverty, unemployment, income inequality, inflation, political instability, and level of education (Abadie, 2006; Burgoon, 2006; Berrebi, 2007; Piazza, 2006, 2011). In economics, it is natural to evaluate the theme of joining terrorist groups in the context of occupational choice (risk and reward). The participation in terrorism is based on economic theory (i.e. rational choice theory). The terrorist evaluates the benefits/rewards and risks/costs. Moreover, in the study of "hate crimes" which can be a closed similar to terrorism we can state that the criminals can be rational people. In criminology, rational choice theory assumes a utilitarian faith that humans are reasoning actors who weigh the means and ends and the risks/costs and rewards/benefits, and makes a rational choice. In this case, the target of an offense is selected, not because of individual behavior, rather picked on the basis of group identity. Some literature studies related to the economies of some countries such as Germany, Turkey, Africa and America suggested that the incidents of hate crimes have very little link to economic conditions. Moreover, empirically Krueger and Maleckova (2002, 2003) find opposite evidence. They examine the relationships among poverty, educational status, and participation of terrorists in terrorist activities. Data from 129 members of the Hezbollah terrorist group

killed in the 1980s and 1990s suggest that a high standard of living and a high educational status are the major causes of terrorism. Thus, the study of Kruger and Maleckova negate the statement that poverty and illiteracy are the causes of terrorism. Likewise, the research work of Piazza (2006) examines whether the poor economic performance of the economy is a factor of terrorism or not. The author examines the cross-sectional data of 96 countries and determines that economic performance and terrorist attacks have no statistically significant relationship.

Terrorism and poverty are vicious factors that have been faced by developing economies such as Pakistan since the last decade. Most of literature on the relationship between poverty and terrorism are based on the country level data. This research on one side attempt to develop an indicator to evaluate the relationship between poverty and terrorism, while on the other side empirically test the relationship between poverty and terrorism at provincial level of Pakistan.

The rest of the paper is organized as follows. The second section discusses the theoretical framework, and the third section explains the methodology of the PTEM indicator. The fourth section presents the empirical part of the PTEM indicator application to the Pakistan economy. The fifth section evaluates the econometric analysis to support the PTEM technique hypothesis. The last section gives the conclusion and policy recommendations.

4.2 Theoretical Framework

The most important economic interpretation of the causes of terrorism commonly emphasizes two main aspects: poor economic conditions and lack of economic opportunities.

In fact, socio-economic conditions such as poverty and income inequality feed frustration, hatred, and grievance. These factors are the likely causes of terrorism. When

widespread poverty prevails in a society, the opportunity cost of terrorism for individuals is significantly low. This relationship provides such scenario that encourage the people and speed the recruitment process undertaken by terrorist organizations. This point which is constructed on the classical opportunity–cost argument is commonly known as the economic deprivation argument (Gurr, 1968).

The causes of terrorism can also be explained by immiserizing modernization theory. This theory, which was introduced by Olson (1963), indicates that economic performance is unevenly distributed among different groups in a society and is expected to produce a shift in the distribution of interest as it stimulates the grievances of some individuals in the society. This theory explicitly states that long-term socio-economic fluctuations upset socio-economic environments. In this view, terrorist organizations flourish by recruiting hopeless people and use these people for terrorist activities. Therefore, terrorism and political violence can arise along with economic performance.

4.3 Poverty Terrorism Evaluation Measurement (PTEM)

In this part of the chapter, the methodology of terrorist economic impact evaluation (TEIE) technique (Khan and Yusof, 2016) in chapter 3 for computation of terrorism intensity measurement is extended and modified. The intensity of any terrorist action can be measured by the number of terrorism incidents, number of fatalities, number of injuries, and capital loss in a particular locality. The intensity of terrorist action can be written in the following functional form (See Figure 4.1):

$$\Psi = f(\gamma, \omega, \chi, \mu) \qquad (4.1)$$

Where (Ψ) is the terrorist attack, (γ) is the number of terrorist incidents, (ω) is the number of fatalities in a terrorist action, (χ) is the number of injured persons in a terrorist attack, and (μ) is the capital damage.

Hypothesis

Based on the above literature, the following hypotheses are developed.

H_0: Poverty has no linkage with terrorism.

H_1: Poverty has linkage with terrorism.

Assumptions

The PTEM is constructed on the basis of the Omnia Mobilis assumption. This assumption describes that all relevant variables are important and should be considered in policy modeling. The Omnia Mobilis assumption is applied to cover all possible relevant variables in the study (Ruiz Estrada, 2011). The DIS is developed with the application of the Omnia Mobilis assumption (Ruiz Estrada, 2011). The DIS is not chaos; it is an unconditional and unexpected complex sensitive reaction to all possible uncertain events generated by controlled and uncontrolled variables simultaneously under irregular scenarios (Ruiz Estrada and Yap, 2013). As these assumptions are based on the intuition that unexpected shocks (e.g., those in the PTEM technique that examines the actions of terrorist's groups) are uncertain, all the possible effects of these shocks can be observed only by taking all the possible variables in the technique Therefore, the technique is studied in a dynamic environment.

The following steps are taken in the PTEM.

4.3.1 Terrorist Attack Incident Growth Rate (γ)

The terrorist attack incident growth rate can be defined as

$$\Delta\left(\frac{\gamma_i - \gamma_0}{\gamma_f - \gamma_0}\right)100 \geq 0 \qquad (4.2)$$

Where (γ_i) is the actual number of terrorist incidents in a particular year, (γ_f) is the highest number of incidents that occurred in the study period, and (γ_0) is the lowest number of terrorist incidents that occurred in the study period.

Its value falls between 0 and 100.

$$0 \leq \gamma \leq 100 \qquad (4.3)$$

4.3.2 Terrorist Attack Fatality Rate (ω_g)

The mathematical formula for measuring the terrorist attacks fatality rate is

$$\Delta\left(\frac{\omega_i - \omega_0}{\omega_f - \omega_0}\right)100 \geq 0 \qquad (4.4)$$

Where (ω_g) is the terrorist attack fatality rate, (ω_i) is the actual number of fatalities in terrorist attacks in a particular year, (ω_f) is the highest number of fatalities in the study period, and (ω_0) is the lowest number of fatalities.

$$0 \leq \omega g \leq 100 \qquad (5.5)$$

4.3.3 Terrorist Attack Injury Growth Rate (χg)

In general, the terrorist attack injury growth rate can be expressed as

$$\Delta\left(\frac{\chi_i - \chi_0}{\chi_f - \chi_0}\right)100 \geq 0 \qquad (4.6)$$

Where (χ) is the terrorist attack injury rate, (χ_i) is the actual number of injured persons in a terrorist attack in a particular year, (χ_f) is the maximum number of injured people in the study period, and (χ_0) is the lowest number of people injured in terrorist attacks in the study period.

$$0 \leq \chi g \leq 100 \qquad (4.7)$$

4.3.4 Terrorist Attack Capital Damage Rate (μ_g)

The terrorist attack capital damage rate can be calculated as follows:

$$\Delta\left(\frac{\mu_i - \mu_0}{\mu_f - \mu_0}\right)100 \geq 0 \qquad (4.8)$$

Where (μ) is the terrorist attack capital damage rate, (μ_i) is the actual number of capital damage in a particular year, (μ_f) is the maximum number of capital damage in the study period, and (μ_0) is the lowest number of capital damage.

$$0 \le \mu g \le 100 \qquad (4.9)$$

4.3.5 Terrorism Evaluation Measurement (Ω)

Terrorism evaluation measurement (Ω) is defined as the arithmetic mean of the four growth rates of terrorist attacks in a country (incidents growth rate, death rates, injuries growth rate, and capital damage growth rates).

$$\Omega = \frac{\gamma + \omega + \chi + \mu}{4} \qquad (4.10)$$

Terrorism vulnerability is measured by Equation (5.10), and its value falls between 0 and 100.

$$0 \le \Omega \le 100 \qquad (4.11)$$

Dividing the intensity of terrorism vulnerability results in three different levels:

Level 1: 0–33 Low vulnerability

Level 2: 33.01–66 Moderate Vulnerability

Level 3: 66.01–100 High Vulnerability

These levels of terrorism vulnerability explain the intensity of terrorism vulnerability, that is, whether it is low or high, and they provide the types of intensity level in a particular period of time.

4.3.6 Poverty Growth Rates (*POV*)

The poverty growth rate can be defined as the percentage of the population whose living standard (typically proxy by consumption) is below a given threshold referred to as the poverty line. The poverty line can be an international threshold ($1.25 per day; $ 2

per day). Simply, people below the poverty line are the proportion of the population counted as poor.

The formula for the poverty (headcount) is as follows:

$$POV = \frac{N_P}{N} \tag{4.12}$$

Where POV is the poverty (headcount), N_P is the number of poor people, and N is the total population in the sample. Equation (5.12) can be rewritten as

$$POV = \frac{1}{N}\sum_{i=1}^{N} I(y_i < x) \tag{4.13}$$

Where I (.) is a gauge that is equal to 1 if the expression in the function is true or 0 if otherwise. Therefore, if (yi) is less than the poverty line (x), then I (.1) is equal to 1, and the particular household is considered poor. This is income dimensional poverty measurement (single indicator). The multidimensional Index (MPI) is another indicator used as a measurement of poverty indicator. This is introduced by UNDP in 2010. It will include health, education and standard of living and these are the main issues faced by any poor family.

4.3.7 Poverty Terrorist Evaluation Measurement (Π)

The relationship between poverty and terrorism vulnerability can be expressed as

$$\Omega = f(Pov) \tag{4.14}$$

Where Ω terrorism vulnerability is explained in Equation (4.10), and Pov is the poverty (headcount) expressed in Equations (4.12) and (4.13).

The PTEM can be calculated as

$$\Pi = \frac{\%\Delta\,\Omega}{\%\Delta Pov} \tag{4.15}$$

The above equation can be rewritten as

$$\Pi = \left(\frac{\Delta\Omega}{\Delta Pov}\right) \times \frac{Pov_{it}}{\Omega_{it}} \tag{4.16}$$

Equation (4.16) can be expressed as

$$\Pi = \left(\frac{\partial \Omega}{\partial Pov} \right) \times \frac{Pov_{it}}{\Omega_{it}} \qquad (4.17)$$

The PTEM (Π) explains the rate of change occurring in terrorism vulnerability caused by the rate of change of poverty. The response of terrorism vulnerability to poverty growth rate has three main possible results.

(a) $\Pi > 1$: If the rate of change of terrorism vulnerability is greater than the rate of change of poverty growth rate

(b) $\Pi < 1$: If the rate of change of terrorism vulnerability is less than the rate of change of poverty growth rate

(c) $\Pi = 0$: If terrorism vulnerability does not respond to poverty growth rate, then it will not change because of poverty growth rate.

4.4 PTEM Indicator Contributes to the Existing Literature

The relationship between terrorism and economic factors may follow a spatial pattern due to the spill over effects among regions/provinces. Despite the fact that a few studies discuss that geographical factors play an essential part in deciding the likelihood of terrorist incidents, none of them studies the issue with regard to the economic effects of terrorism. The connections between terrorism incidents and various factors are generally assumed to be stationary in space, and a single regression equation has been employed in observed studies. Generally, in the literature it shows a general relationship that might not be valid over the entire study area, as the variation in the parameters can lead to inconsistent estimators (Temple, 1999). However, it makes sense to assume that the association between various factors and the level of terrorism is diverse in various parts of different provinces/states in the same country (Bilgel & Karahasan, 2015).

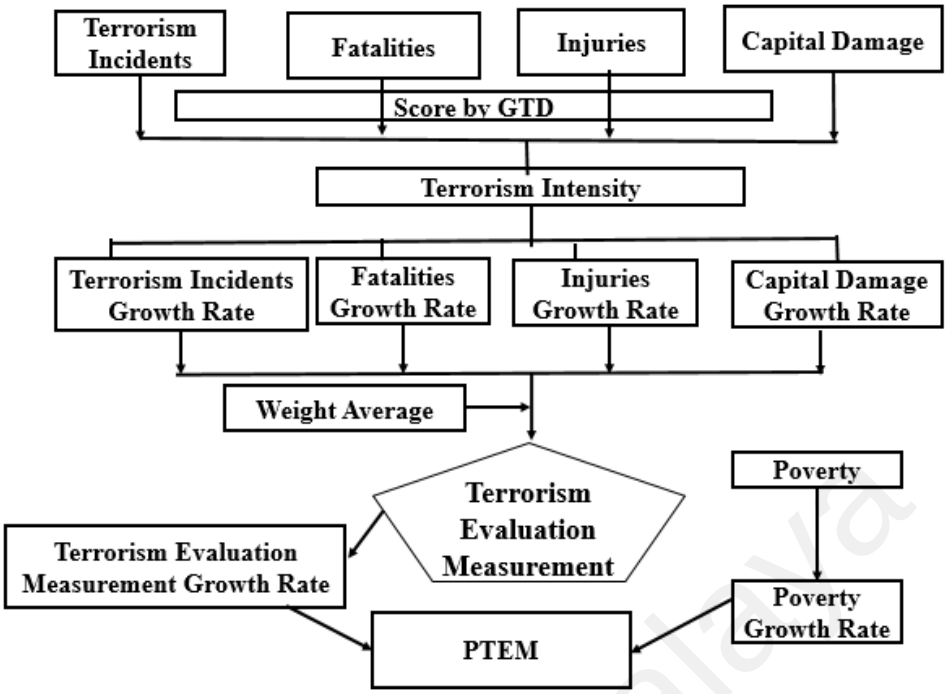

Figure 4.1: Flow chart of PTEM Indicator

The PTEM indicator provides a basic concept to evaluate the impact of poverty at province level terrorism. This study will allow to minimize heterogeneity biases. As mentioned previously, that terrorism and economic factors are heterogeneous within one country, so province level analysis between poverty and terrorism is needed. The application of PTEM technique of terrorism investigation is structurally different with respect to other case studies that investigate the causal effect of economic conditions on terrorism, such as the study of Abadie and Gardeazabal (2003). For example, Euskadi Ta Askatasuna (ETA) in Spain, terrorism outbreaks in the highly-developed region of Basque country in Spain and thus temporal variation in economic prosperity, as argued by Abadie and Gardeazabal (2003), is unlikely to have had a sizable impact on ETA terrorism. In contrast, PTEM model almost completely outbursts in the least developed areas of Pakistan. In the PTEM technique application to Pakistan case, adversative economic conditions may upsurge the intensity of terrorism activities. These modifications make the application of PTEM technique a special case.

4.5 Application of the PTEM Indicator to the Pakistan Economy

Pakistan is a less-developing economy with four provinces/states, namely, Khyber Pakhtunkhwa (KPK), Balochistan, Sindh, and Punjab. Statistics from Poverty in Pakistan indicate that every third Pakistan is trapped in the "poor" range. About 58.7 million people among the total population of 180 million are below the poverty line. The magnitude of poverty growth rate varies across the provinces of Pakistan. The province with the most extreme poverty is Balochistan, where more than half of the population are found below the poverty line, followed by KPK, Sindh, and Punjab, which has the least poverty (See Figure 4.2). Among the top 20 poorest districts, 16 districts are found in Balochistan, and the remaining four districts are found in KPK (Dawn Newspaper, 2012).

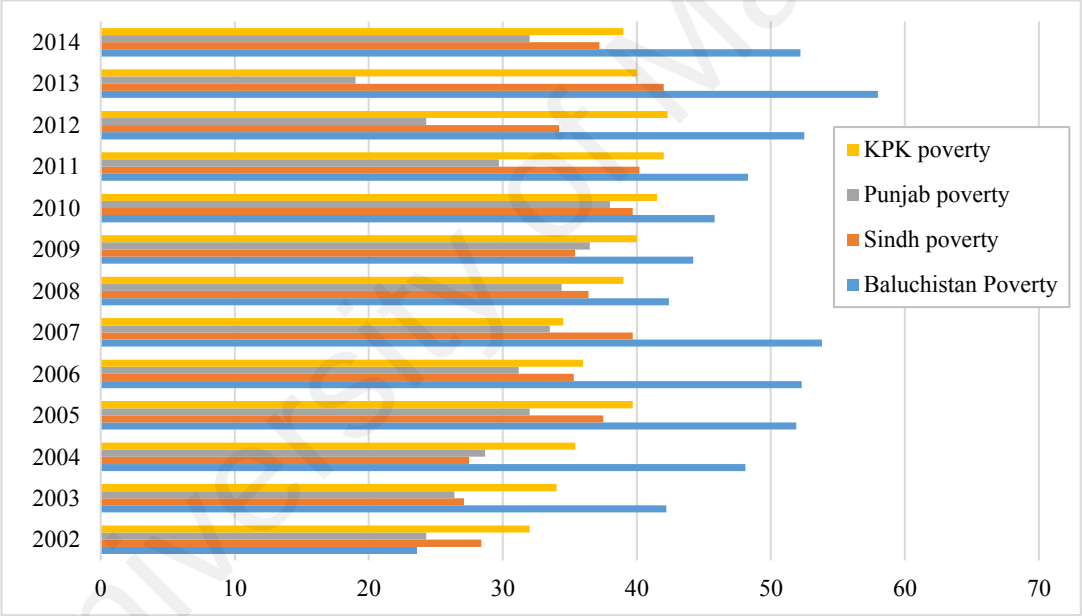

Figure 4.2: Province-wise Poverty Growth Rates of the Pakistan Economy

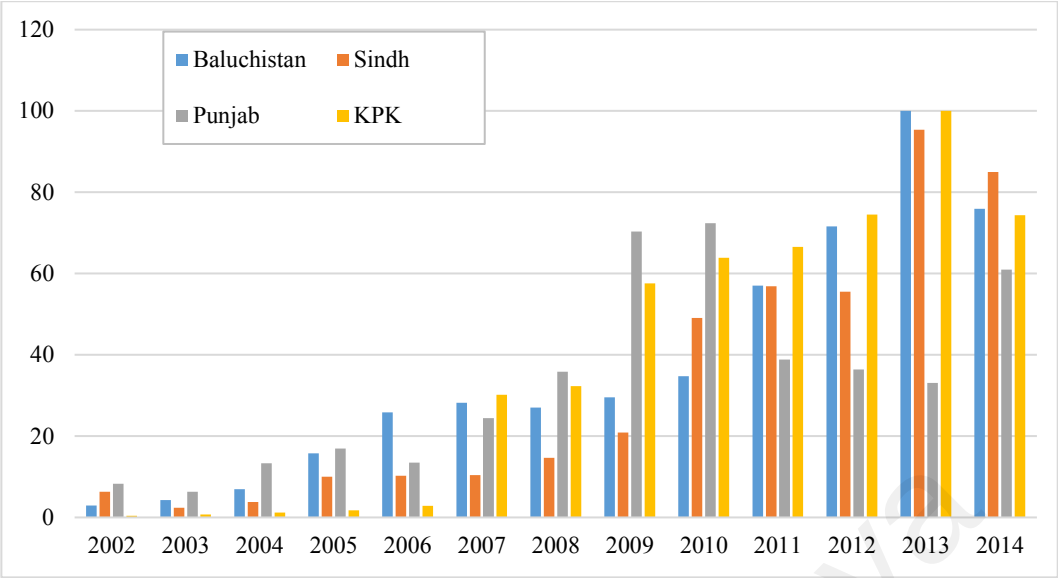

Figure 4.3: Province-wise Terrorist Activities in Pakistan

Similar to poverty, the terrorism situation is also not uniform across the different areas of Pakistan. The South Asian Terrorism Portal (SATP) (2015) reports that the Federally Administered Tribal Areas were the areas most affected by terrorism in Pakistan with the highest fatalities (2863), followed by Sindh (1180), Balochistan (653), KPK (617), Punjab (180), and Gilgit-Baltistan (3) in 2014. Compared with the fatality statistics of the previous year, those in 2014 show a decline in the number of deaths in Balochistan, KPK, Sindh, and Gilgit-Baltistan (See Figure 4.3).

4.6 Results of the PTEM Indicator

The PTEM indicator is applied to the four provinces of Pakistan from 2002 to 2014. The poverty data are collected from various economic survey issues of Pakistan, household survey and the World Bank (WB) reports. The terrorism data are taken from the Global terrorism database (GTD) (2015). Results of the PTEM technique are arranged in the sequence of KPK, Balochistan, Sindh, and Punjab.

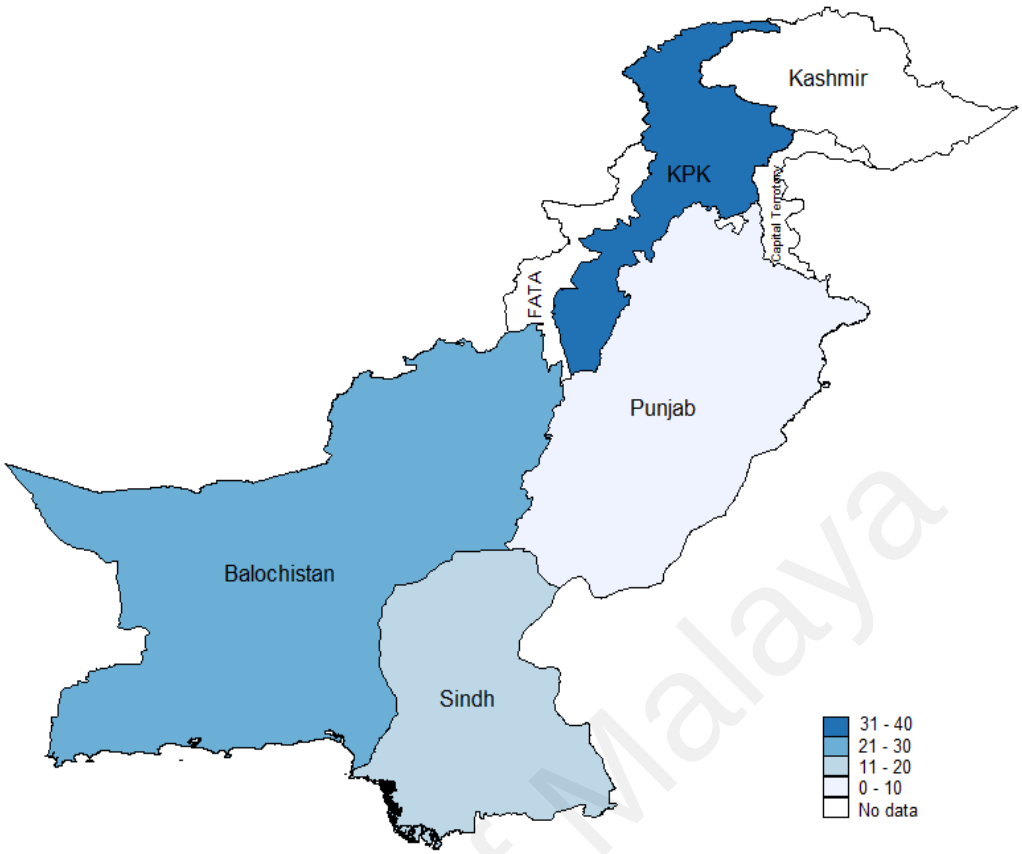

Figure 4.4: Spatial Distribution of Terrorism in Pakistan

Source: Author's Own Estimations

Figure 4.4 explains the distribution of terrorism activities among the provinces of Pakistan economy. The results of the above map further explain that KPK province has observed more terrorism incidents which range from 31% to 40% according to the terrorism evaluation measurement results. The second highest score for terrorism measurement is the Balochistan province, which ranges from 21 to 30%. The third highest score of terrorism is calculated for the Sind, where terrorism evaluation measurement score ranges from 11 to 20%. The smallest value of terrorism evaluation measurement is for the Punjab province, which ranges from 0 to 10%. The results of the map for the Pakistan economy at province level conclude that terrorism intensity is much higher in KPK and Balochistan province as compared to the other two provinces of Pakistan that is Sindh and Punjab.

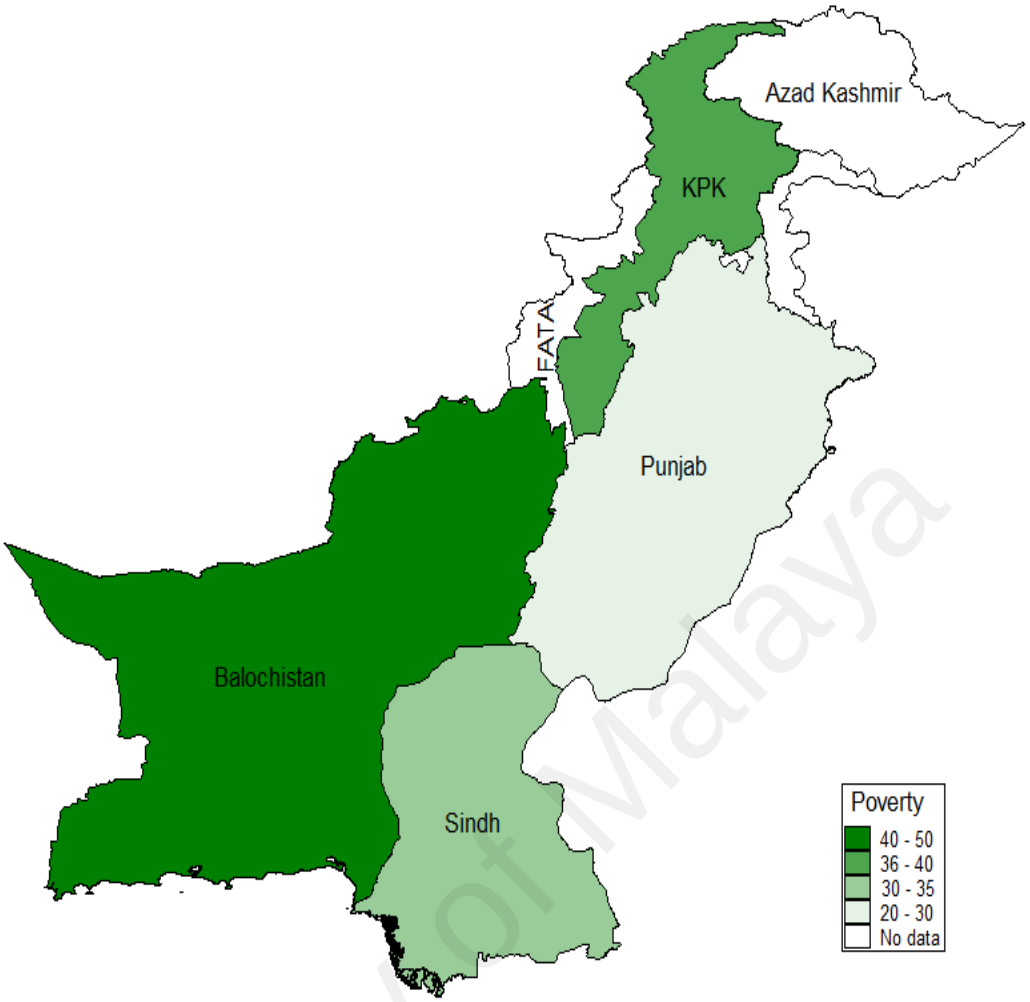

Figure 4.5: Spatial Distribution of Poverty in Pakistan

Source: Author's Own Estimations

Similarly, the distribution of poverty data at the provincial level of Pakistan demonstrates that high poverty has been observed in Balochistan province followed by KPK. Poverty score in the case of Balochistan ranges from 40 to 50%. The second highest poverty score is calculated for the KPK province, which ranges from 36 to 40%. The third highest poverty score has been measured for the Sindh province, which ranges from 30 to 35%. The lowest poverty score has been calculated for the Punjab province, which ranges from 20 to 30% (Figure 4.5).

Table 4.1: PTEM of KPK Province in Pakistan

KPK Province	2002–2005	2006–2009	2010–2014	Average
Terrorism, Evaluation Measurement (Ω)	0.54	30.73	73.98	38.1
Terrorism, Evaluation Measurement Growth Rate (%)	130.54	367.94	7.84	158.55
Δ Poverty Growth Rate (%)	7.50	0.36	0.03	2.01
Poverty, Terrorist Evaluation Measurement (Π)	32.65	168.28	7.22	67.26

Source: Author's Own Estimations

Table 4.1 presents the PTEM analysis in KPK. The results indicate that terrorism evaluation measurement (Ω) ranges from 0.54% to 73.98% from 2002 to 2014. The 0.54% value of the terrorism evaluation measurement (Ω) for 2002–2005 is at level 1 (i.e., low vulnerability of terrorism evaluation measurement). For the next four years (2006–2009), the calculated value of terrorism vulnerability is 30.73% and is in the range of low vulnerability of terrorism evaluation measurement (Ω). The value of terrorism vulnerability in 2006–2009 becomes higher than that in 2002–2005. The terrorism evaluation measurement value in 2010–2014 is 73.98%, which indicates a high vulnerability rate at level 3 of terrorism vulnerbility. The average value of terrorism evaluation measurement in 2002–2014 is 38.94%, which is at the range of level 2 (i.e., moderate terorism vulnerability). Similarly, the growth rate of terrorism evaluation measurement ranges from 130.54% to 158.5 % from the year 2002 to 2014. The estimated growth rates of terrorism evaluation measurement show that over a period of time, there is an increase in the terorirsm evalaution measurement. The average poverty (Pov) of KPK in the post 9/11 period is 38.10%.

The value of PTEM (Π) for KPK in 2002–2005 is 32.65%. This value indicates that the response of terrorism vulnerability rate of poverty is less sensitive. The value of PTEM in 2006–2009 is 168.28, which is higher than that in 2002–2005. As the value is

greater than 100, the PTEM (Π) is very sensitve. The effect of poverty growth rate on terrorism vulnerability is higher in 2006–2009 than that in 2002–2005. The calculated value of PTEM for KPK in 2010–2014 is 7.22%, which is smaller than those in 2006–2009 and 2002–2005. As the value of PTEM is smaller than 100, it is less sensitive than the values of the other periods. The response to terrorism vulnerability to poverty growth rate is smaller in 2010–2014 than in other periods. The average value of PTEM is 67.26%, which explains that a 100% change in poverty brings about 67.26% change in terrorism vulnerability in KPK in 2002–2014 (see Table 4.1).

Table 4.2: PTEM of Balochistan in Pakistan

Balochistan Province	2002–2005	2006–2009	2010–2014	Average
Terrorism Evaluation Measurement (Ω)	3.31	13.7	49.4	24.22
Terrorism, Evaluation Measurement Growth Rate (%)	146.19	78.02	28.06	74.25
Δ Poverty Growth Rate (%)	33.56	-3.32	3.65	8.80
Poverty Terrorist Evaluation Measurement (Π)	2.64	74.74	4.91	27.62

Source: Author's Own Estimations

Table 4.2 presents the results of the PTEM indicator in Balochistan. The terrorism evaluation measurement (Ω) value of Balochistan in 2002–2005 is 3.31%, which is at level 1 (i.e., low vulnerability of terrorism vulnerbility). The terrorism evaluation measurement (Ω) value in 2006–2009 is 13.7%, which is higher than that in 2002–2005 but remains at the level 1. The terrorism vulnerability rate 2010–2014 is 49.39%, which is higher than those in 2006–2009 and 2002–2005 and is at level 2. The average value of terrorism vulnerability for Balochistan is 24.22%, which is at level 1 (i.e., low vulnerability of terrorism). In the same way, terrorism evaluation measurement growth rate values range from 146.19 to 28.06% from the year 2002 t0 2014. The average value

of terrorism evalaution measurement growth rate from the year 2002-2014 is 74.25. The results of terrorism evaluation measurement growth rate explains that there is an increase in the terrorism score growth rate. The average poverty growth rate (Pov) of Balochsitan in the post 9/11 period is 47.33%.

The PTEM (Π) of Balochistan in 2002–2005 is 2.62, which is higher than that of KPK in the same period. This value of PTEM (Π) indicates that a 100% change in poverty brings about a 2.62% change in terrorism vulnerability. Therefore, the response of terrorism vulnerability to poverty growth rate is not very sensitive. The value, of PTEM (Π) in 2006–2010 is 74.74, which is higher than that in 2002–2005 for the same province but lower than the value of KPK in the same period. Again, the response of terrorism vulnerability to poverty growth rate is less than 100, and thus it is less sensitive in the case of Balochistan in 2006–2009. The calculated value of PTEM (Π) in 2010–2014 is 4.91, which is smaller than in 2006–2009 and greater than in 2002–2005. However, the value of (Π) is less than that of KPK in the same period. The value of PTEM (Π) indicates that the response of terrorism vulnerability to poverty growth rate is less elastic as the value is smaller than 100 and is thus less sensitve. This finding also means that a 100% change in poverty growth rate brings about an 89% change in terrorism growth rate of Balochistan in 2010–2014. The average growth rate of the PTEM (Π) of Balochistan is 27.62 in post 9/11 (2002–2014). Thus, the average overall response of terrorism vulnerability to poverty growth rate is positive but not very sensitive in the case of Balochistan in 2002–2014 (see Table 4.2).

Table 4.3: PTEM of Sindh in Pakistan

Sindh Province	2002–2005	2006–2009	2010–2014	Average
Terrorism Evaluation Measurement (Ω)	3.12	5.14	32.58	15.07
Terrorism, Evaluation Measurement Growth Rate (%)	-9.04	85.38	72.17	60.78
Δ Poverty Growth Rate (%)	11.08	-1.11	1.97	3.22
Poverty, Terrorist Evaluation Measurement (Π)	5.14	4.97	28.97	13.12

Source: Author's Own Estimations

Table 4.3 presents the findings of Sindh. The terrorism vulnerability value of Sindh in 2002–2005 is 3.12%, which shows that terrorism vulnerability rate is low and is at level 1 of vulnerability according to our estimates. This value of terrorism vulnerability in Sindh is higher than that in KPK in the same year but less than that in Balochistan in 2002–2005. The estimated value of terrorism vulnerability measurment for Sindh in 2006–2009 is 5.14%, which is higher than that of the previous time period in the same province. This vulnerability rate of terrorism is at level 1. The calculated value of terrorism vulnerability measurement for Sindh in 2010–2014 is 32.58%, which is at level 1. The vulnerability of terrorism for Sindh in 2010–2014 is lower than those of KPK and Balochsitan for the same time period. The average growth rate of terrorism vulnerability for Sindh is 15.07%, which is low and is at level 1 of terrorism vulnerabilty in 2002–2014. Similarly, the growth rates of terorrism evaluation measurement range from -9.04 to 72.17 from the year 2002 to 14. The average vale of terrorism evaluation measurement growth rate is 60.78. This result explains that over a period of time the terorism score growth rate has increased in the case of Sindh.

The average poverty (Pov) of Sindh in post 9/11 (2002–2014) is 35.43%, which is lower than those of KPK and Balochsitan at the same time period.

According to our estimated results, the value of PTM (Π) is 5.14 for Sindh in 2002–2005 period. This value of (Π) is less elastic and less sensitive. This finding means that response to terorism vulnerbility to poverty growth rate is less sensitive. However, for the same time period, the value of (Π) is greater than the province of Balochistan but smaller than the province of KPK. The calculated value of (Π) for Sindh in 2006–2009 is 4.97. This value shows that a 100% change in the poverty growth rate brought only 4.97% change in terrorism vulnerability, which is not very sensitive. The calculated value of PTEM (Π) for Sindh in 2010–2014 is 28.97, which is smaller than 100. Therefore, response of terrorism vulnerability to poverty growth rate is less sensitive. However, the value of PTEM (Π) is less that of KPK and Balochistan for the same time period. The average growth rate of PTEM (Π) for Sindh is 13.12, which is less sensitive and less elastic than that of Balochstan. Moreover, the value is also smaller than that of KPK (see Table 4.3).

Table 4.4: PTEM of Punjab in Pakistan

Punjab Province	2002−2005	2006−2009	2010−2014	Average
Terrorism Evaluation Measurement (Ω)	2.93	10.32	11.25	8.40
Terrorism, Evaluation Measurement Growth Rate (%)	72.32	589.18	-3.45	213.03
Δ Poverty Growth Rate (%)	9.61	3.92	2.14	4.60
Poverty Terrorist Evaluation Measurement (Π)	8.83	86.02	0.24	30.98

Source: Author's Own Estimations

Table 4.4 summarizes the findings in Punjab. According to the estimated results, the terrorism evaluation measurement (Ω) value of Punjab in 2002–2005 is 2.93%, which is found in the low level of vulnerability and lies in level 1 vulnerability. The value of terrorism vulnerability rate for Punjab is higher than those in the other three provinces of Pakistan in 2002–2005. The estimated value of terrorism evaluation measurement (Ω) in

2006–2009 is 10.32%, which is found in level 1 of terrorism vulnerability; therefore, the terrorism vulnerability is at the lower level in 2006–2009. The calculated value of (Ω) in Punjab in 2010–2014 is 11.25%, which is lower than those of KPK, Balochistan, and Sindh. This value of terrorism vulnerability (Ω) is level 1. The average growth rate of terrorism vulnerability in 2002–2014 is 8.40%, which is at the low level of vulnerability. The average terrorism vulnerability rate of Punjab is at level 1. Similarly, the terrorism evaluation measurement growth rates range from 72.32 to -3.45 from the year 2002 to 2014. The average value of terrorism evaluation measurement growth rate is 213.03. The average poverty growth rate (Pov) of Punjab after 9/11 (2002–2014) is 29.6%.

The calculated value of PTEM (Π) in Punjab in 2002–2005 is 8.83, which means that the response of terrorism vulnerability to poverty growth rate is less sensitive. In the same period, the value of PTEM (Π) for Punjab is greater than those of Sindh and Balochistan provinces but smaller than KPK in the same period. The estimated value of PTEM (Π) in 2006–2009 is 86.02, which is greater than that of the same province in the previous year. This value of (Π) indicates that the response of terrorism vulnerability measurement to poverty growth rate is less elastic. 100% change in poverty growth rate brings about less than 100% changes in terrorism vulnerability growth rate. The calculated value of PTEM (Π) in 2010–2014 is 0.24, which means that the response of terrorism vulnerability to poverty growth rate is less elastic. This value of PTEM (Π) shows that a 100% changes in poverty brings about less than 100% change in terrorism vulnerability. The average growth rate of PTEM (Π) in post 9/11 (2002–2014) is 30.98. Therefore, on average, the response of terrorism vulnerability to poverty growth rate is less elastic in the case of Punjab in 2002–2014 (see Table 4.4).

The results of poverty growth rates and terrorism growth rates confirm that, on the average the terrorism is higher in those provinces, which have relatively high poverty.

For example, the poverty is relatively much higher in the provinces of KPK and Balochistan and terrorism is also much higher in those provinces (see figure 4.6).

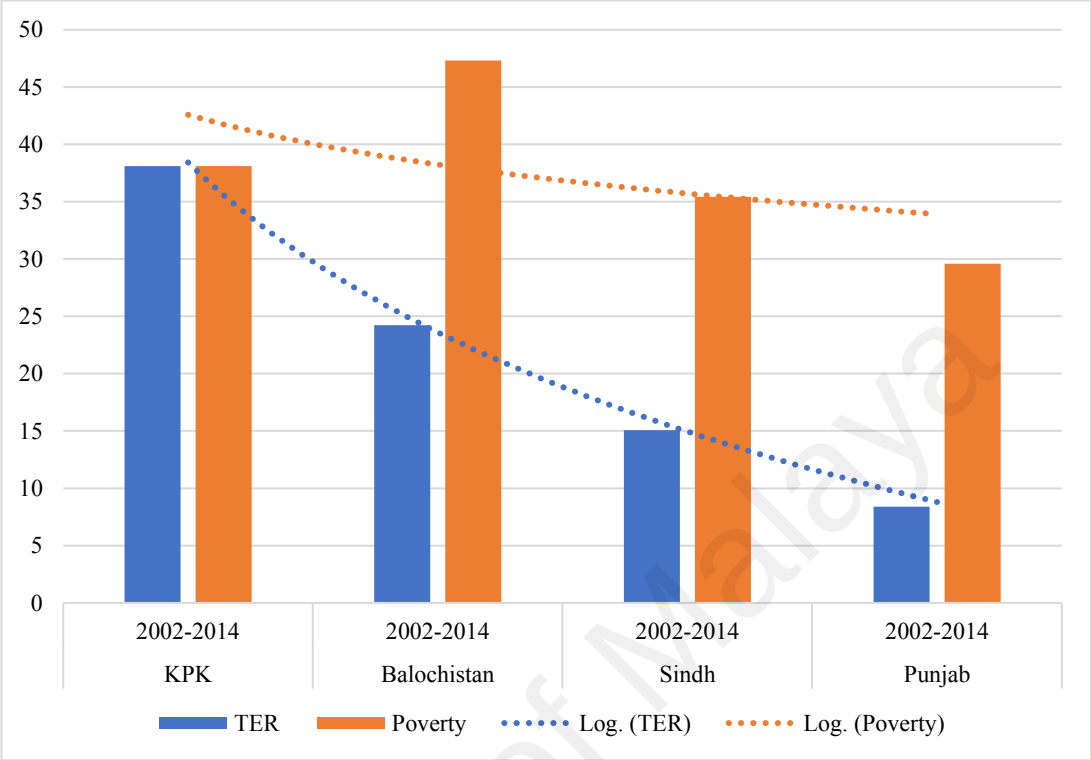

Figure 4.6: Poverty and terrorism growth rates trend in Pakistan Provinces

The PTEM average values of the provinces of Pakistan have been shown in the figure 4.7. On the average, after the post 9/11 period, the value of PTEM is positive, which confirms that there are linkages between poverty and terrorism in the case of the provinces of Pakistan. As we move from low poverty and low terrorism intensity of terrorism provinces such as Punjab and Sindh, to higher poverty and higher intensity of terrorism of provinces such as Balochistan and KPK, there is upward trend line. The trend further explains that poverty and terrorism at province has some linkages.

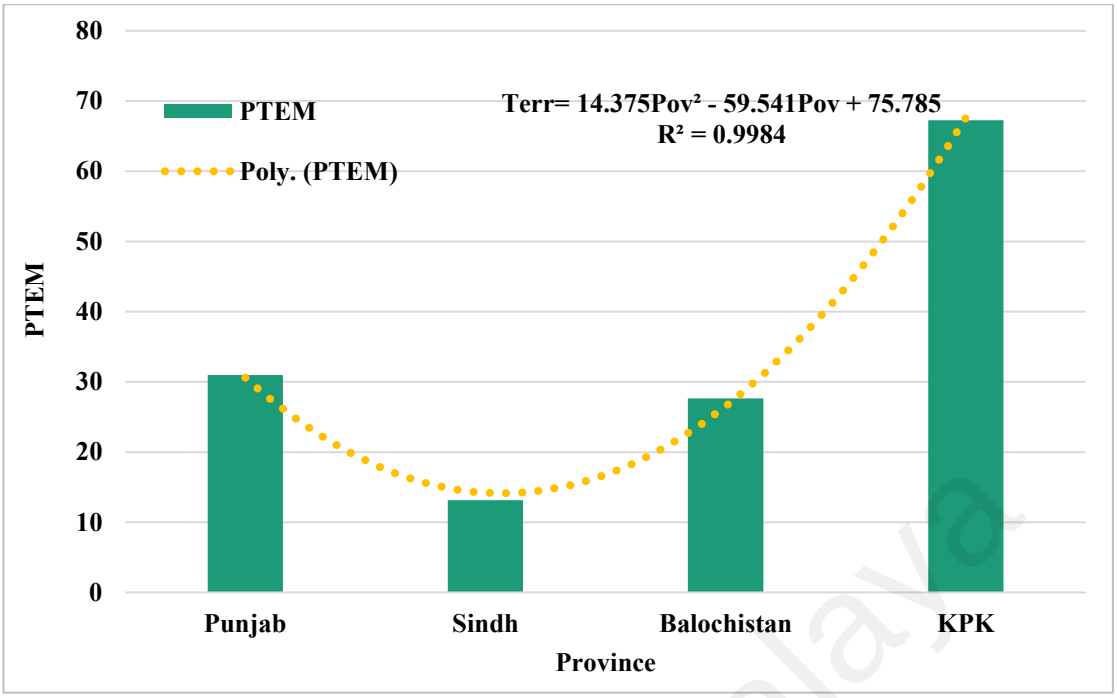

Figure 4.7: Average PTEM Trend Line Among the Provinces of Pakistan

4.7 Econometric Analysis: Is Terrorism Linked to the Socio-economic Condition?

In examining the relationship between poverty and terrorism, an econometric analysis is conducted to support the results of the PTEM. The basic indicator is expressed as follows:

$$\Omega = f(Pov, N, Edu) \qquad (4.18)$$

where;

Ω = Terrorism vulnerability measurement of the provinces of Pakistan

Pov = Poverty growth rates (headcount) of the provinces of Pakistan

N = Total population of the provinces of Pakistan

Edu= the literacy rate in the provinces of Pakistan.

The dependent variable of the model is terrorism vulnerability (Ω). The independent variables of the model are population (N), poverty growth rate (Pov), and literacy rate of all the four provinces of Pakistan. The time period of the study is post 9/11 (2002-

2014). The independent variable data are collected from various economic survey issues and the World Bank (WB) reports.

The order of integration of the variables is examined by the panel unit root test such as LLC, IPS, ADF-Fisher and PP-fisher (Maddala & Wu, 1999; Levin, Lin & Chu, 2002; & Im, Pesaran & Shin (IPS),2003). Once the order of integration is decided, then for the long run relationship among the variables of the model, the Johnson Fisher panel cointegration (1988) and fully modified ordinary least squares (FMOLS) (Pedroni, 2001) techniques are used. Johansen Fisher panel cointegration test is a panel version of the individual Johansen (1988) maximum likelihood cointegration test. The first conditions for panel cointegration is that variables must be non-stationary at level. Second, the variables will be stationary at 1st difference. The Johansen Fisher panel cointegration test aggregates the p-values of individual Johansen maximum eigenvalue and trace statistics (Johansen, 1995). The value of the chi-square statistic is based on the MacKinnon et al. (2001) p-values for Johansen's (1988) cointegration trace test and maximum eigenvalue test. This study also applies to the panel fully modified OLS estimator (FMOLS) developed by Pedroni (2001). The advantage of FMOLS estimator is that it not only produces consistent estimates of the β parameters in relatively small samples. It can also use to control for the likely endogeneity of the regressors and serial correlation. Similarly, the FMOLS estimator for the i-th panel member is specified by,

$$\mathrm{B}_{i,t} = \left(X_{i,t}{}' X_{i,t} \right)^{-1} \left(X_{i,t}{}' Y^{*}{}_{i,t} - T\delta \right) \tag{4.19}$$

Where,

Y^{*}= Transformed endogenous variable,

δ = Parameter for autocorrelation adjustment and;

T = Time period number.

The equation for the model can be expressed in quadratic function as below;

$$\ln TR_{i,t} = \ln \alpha_{0i,t} + \alpha_{1i,t} \ln Pov + \alpha_{2i,t} \ln Pov^{2} + \alpha_{3i,t} \ln N + \alpha_{4i,t} \ln Edu + \varepsilon_{i,t} \qquad (4.20)$$

4.7.1 Econometric Results

The econometric model results are arranged at the table 4.6 shows the unit root tests results, followed by the Johnsen Fisher cointegration results (Table 4.7). At the end, the FMOLS results explain in Table 4.8. The pairwise correlation matrix of the variables in the model is shown in Table 4.5. Results of correlation matrix explain that independent variables have no issue of multicollinearity.

Table 4.5: Correlation Matrix

Variable	LNTR	LNPOV	LNPOP	LNEdu
LNTR	1	-	-	-
LNPOV	0.37	1	-	-
LNPOP	0.11	-0.46	1	-
LNEdu	0.22	-0.22	0.33	1

Source: Author's Own Estimations

Table 4.6: Panel Unit Root Results

At Level I (0)				
Variable	LLC	IPS	ADF-Fisher	PP-Fisher
LNPOP	5.02(1.00)	2.02(0.97)	6.22(0.62)	7.49(0.48)
LNTR	1.47(0.92)	-0.38(0.34)	7.58(0.47)	1.7(0.98)
LNPOV	-1.01(0.84)	-0.91(0.18)	2.39(0.96)	-1.58(0.99)
$LNPOV^2$	1.26(0.89)	-0.56(0.28)	8.82(0.37)	1.77(0.98)
LNEdu	-0.45(0.32)	-1.09(0.13)	4.72(0.78)	5.02(0.75)
At Ist Difference I(1)				
LNPOP	-1.96(0.02)**	-1.38(0.00)***	14.20(0.07)**	23.71(0.00)***
LNTR	-6.52(0.00)***	-2.32(0.01)**	19.21(0.01)**	47.81(0.00)***
LNPOV	-4.86(0.00)***	-1.90(0.02)**	30.97(0.00)	54.12(0.00)***
$LNPOV^2$	-6.69(0.00)***	-4.19(0.00)***	29.91(0.00)***	51.88(0.00)***
LNEdu	-74.54(0.00)***	-39.13(0.00)***	38.43(0.00)***	39.47(0.00)***

Note: ***, ** indicate significance level at 1% and 5% respectively.

The unit root tests are LLC, IPS, ADF-Fisher and PP-Fisher are applied to investigate the order of integration of all variables in the model. The results of unit root tests for panel study conclude that all variables are not significant at 1% level. After taking the first

difference of all the variables, it is observed that all variables of the study become stationary.

Table 4.7: Johansen Fisher (Trace) cointegration

Variables	$r=0$	$r\leq1$	$r\leq2$	$r\leq3$	Cointegrated rank
Panel	39.61*	90.24*	29.23*	14.19*	4

Note: * shows the cointegration vector

Source: Author's Own Estimations

Table 4.8: FMOLS test results

Variables	Coefficient	*t*-statistic
lnN	0.3179**	3.7862
lnLiteracy	-0.5539***	-6.858
lnPov	-0.493***	-5.1578
$lnPov^2$	0.08921***	4.3929

Note: ***. ** indicate the 1% and 5% level of significant respectively

Source: Author's Own Estimations

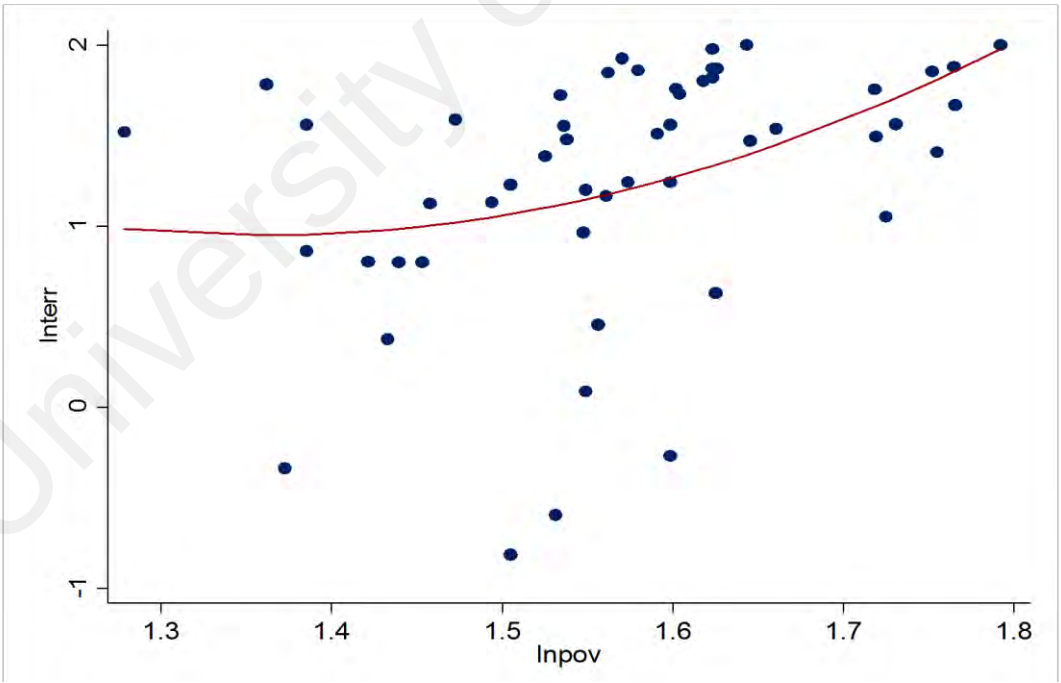

Figure 4.8: Linear and partial fitted of the relationship between terrorism and poverty

The results of the FMOLS and Johansen Fisher cointegration confirm that terrorism and poverty have a long run relationship in the case of Pakistan provinces study. Details

of the coefficient results of FMOLS technique for the robustness purpose are discussed. The FMOLS results indicate that poverty growth rates and terrorism vulnerabilities of the provinces have a nonlinear function which means that an increase in poverty, there will be an increase in terrorism incidents. `This relationship says that poverty initially reduces terrorism. However, if the increase in poverty is persistent a long time, continuous deprivation among people ultimately become a driver of terrorism. Once again, the situation of Balochistan, KPK and Tribal areas in Pakistan is the evidence of this result, where poverty initially reduced terrorist attacks. However, unending poverty left no choice with the people's youth of under developed areas but to turn to violent means to make their province a separate country by violent means. There are so many terrorist groups in Balochistan province and the north part of KPK, whom attack against the government officials and some of them are saying that their resources are used by other provinces like Punjab and for the revenge join the terrorist groups. As a policy matter, the results of poverty and terrorism relationship suggest that effective poverty measures would improve the security situation among the provinces in Pakistan and will reduce terrorism.

The study work of Enders and Hoover (2012) justifies that the relationship between poverty and terrorism is nonlinear. The positive relationship between poverty and terrorism are supported from the literature studies such as Stern (2003), Miguel et al., (2004), Aziz (2009), Krieger and Meierrieks (2011). The literature studies which contradict this relationship are the studies of Krueger and Maleckova (2003), Abadie (2006) and Gassebner and Luechinger (2011). Actually, these studies were conducted in the developed countries and that's why they contradict the positive relationship between poverty and terrorism.

The control variables in the model are the population of Pakistan's provinces and literacy rate. The coefficients of the control variables population and education are

according to the theory. The coefficient of population confirms that an increase in population results in an increase in terrorism vulnerability and vice versa. The positive relationship between population level and terrorism is supported by the study of Mascarenhas and Sandler (2014). The coefficient of the education variable (literacy rate) of the provinces of Pakistan is negative and significant which confirms that increase in literacy rate will decrease the terrorism in these areas. Low level of literacy rate coincides with higher level of terrorism and illiterate people can be easily recruited by terrorist groups. Studies work of Berrebi (2007) and Tavares (2004) have found that higher illiteracy (less literacy) have positive (negative) impact on terrorism. Education can be a useful tool to eradicate terrorism in the developing countries (Azam and Thelen, 2008). The studies of Collier and Hoeffler (2004) and Shafiq and Sinno (2010) contradict the negative relationship between literacy rate and terrorism and gave the justification that the terrorist attacks of 9/11 were all well-educated. The results of the model are consistent with those of Ismail and Amjad (2014), Gurr (1970), and Kruger (2008). The econometric results support the PTEM technique and confirm that poverty and terrorism have a strong and significant relationship in the case of the provinces of Pakistan.

The results of the model are in accordance with Gurr's (1968) theory of economic deprivation, which explains that when widespread poverty prevails in society, the opportunity cost of terrorism for individuals is less. This explanation provides grounds that favor the recruitment process of terrorist organizations, thus making terrorist attacks easier and less expensive to undertake in society compared with other activities. The policy implication of the indicator reveals that curbing the terrorism problem in the provinces of Pakistan requires policymakers to consider and increase the opportunity cost of terrorism. And policymakers should create policies that can reduce the disparities in society, reduce poverty, and control population growth.

4.8 Conclusion and Policy Recommendations

This research investigates the link between poverty and terrorism. The proposed PTEM indicator examines the relationship between poverty and terrorism. The findings show that high poverty is followed by high terrorism, thus suggesting that high poverty creates high terrorist activities. The PTEM indicator is developed and applied to the Pakistan economy. The PTEM indicator reveals the behavior of terrorism when any change occurs in poverty growth rate. The time span of the application of the PTEM indicator of the provinces of Pakistan is from 2002 to 2014. Results of the PTEM technique applied to KPK indicate that the average value of PTEM is 67.26, which shows that a 100% change in poverty brings about 66.26% change in terrorism vulnerability to KPK in post 9/11 (2002–2014). The average growth rate of poverty, terrorism evaluation measurement (Π) for Balochistan in 2002–2014 is 27.62. The overall average response of terrorism vulnerability to poverty growth rate is positive in the case of Balochistan but is less sensitive than the case of KPK in post 9/11 (2002–2014). The average growth rate of PTEM (Π) for Sindh is 13.12, which is less sensitive than that of Balochistan and of KPK at the same time period. The average growth rate of PTEM (Π) for Punjab in 2002–2014 is 30.98. The results of the PTEM technique show a link between poverty and terrorism vulnerability among the provinces of Pakistan, but the link fluctuates over time and across geographical locations. These results of the PTEM technique are supported by the econometric analysis. The econometric results also confirm the findings of the PTEM technique, thus showing that poverty generates terrorism in the case of the provinces of Pakistan. As a policy recommendation of the study, policymakers should consider increasing the opportunity cost of terrorism in the different provinces of Pakistan to curtail the terrorism issue. Thereafter, policymakers should create policies that can reduce the disparities in society, reduce poverty, and control population growth in each province according to the intensity and magnitude of poverty and terrorism. The main limitations

of this chapter are that it covers only one Islamic country Pakistan province wise analysis, while the reaming three Islamic countries province wise poverty data are not available. This research can be extended to other less developing economies, such as Afghanistan, Nigeria, Syria, and Yemen, among others, facing the problem of terrorism along with poverty.

CHAPTER 5: TRADE AND TERRORISM

5.1 Introduction[6]

After discussing the impact of terrorism at a province level in chapter 3 and poverty-terrorism nexus in chapter 4, it is imperative to investigate the trade terrorism relationship. The aggregate impact of terrorism (TR) on economic performance and international trade remains ambiguous (Bruck and Wickstrom 2004). The empirical work related to terrorism (TR) and international trade of Nitsch and Schumacher (2004) thoroughly explained that TR adversely affects the consumption patterns of consumers in the short run. The consumption patterns of the domestic economy affect the domestic production in export and import substitution, thus dampening the promotion of a stable international trade. TR may also affect the production sector of the economy. The oil-exporting economies of the world are continuously dropping their profits because of domestic attacks by terrorist groups on pipelines, distributions channels, and supply chains. Furthermore, these TR activities affect the oil-exporting nations, further affecting governments' estimation of tax revenue. They also increase the insurance premium of multinational firms and other domestic firms of the government in the petroleum sector. Nitsch and Schumacher (2004) argue that TR generates uncertainty and affects the ability of firms to do business. TR prevention needs more security measures, which make international trade more expensive. TR also increases the time of delivery of goods and services and increase border security for goods mobility.

Many studies have been conducted on TR and economic growth rate. Khan, Ruiz Estrada, & Yusof (2015), Khan and Ruiz Estrada (2015) and Ruiz Estrada, Park, KIM & Khan, (2015) quantify the leakages from the economic growth rate and confirm that TR

[6] The main idea of this chapter has been published in ISI Journal "Quality & Quantity" with the title "Trade-terrorist evaluation index".

affects economic performance. Therefore, no formal index has yet evaluated the nexus between TR and international trade in studies conducted on the juxtaposition between TR and international trade. This study attempts to fill this gap.

The rest of the chapter is organized as follows. The second section presents the theoretical framework, and the third section discusses the TTEI methodology. The fourth section applies the TTEI to the economies of Pakistan, Afghanistan, Iraq and Syria. The fifth section conducts an econometric analysis to support the TTEI hypothesis. The last section gives the conclusion and policy recommendations.

5.2 Theoretical Framework

This work examines the effect of TR on international trade. This relationship can be explained by Heckscher (1919) and Ohlin's (1933) H–O theory of international trade in two different ways as citied by Mckenna (2005). First, TR shifts the investment in capital-intensive goods production to government expenditure for defense. Second, TR increases transaction cost, which restrains factor mobility to areas where labor or capital may be economic in the absence of terrorist attacks. Therefore, when a country is more democratic, it is to deal with TR and terrorist attacks. Thus, according to Tavares (2004), TR has a negative effect on foreign flows, as the number of terrorist attacks reduces the overall demand through a decrease in consumer confidence and an increase in defense expenditures. In other words, TR also negatively affects exports through reduced exchanged earnings. Moser et al. (2008) examine German exports among 130 economies in 1991–2003. The results confirm that TR significantly reduces the exports of these economies. Overall, the preceding arguments and the empirical results have two main implications for the theoretical framework of the study. First, TR incidents tighten border security, which creates obstacles in the way of international trade. Second, terrorist attacks increase transaction costs, which increase the price of exports; therefore, exports become more expensive.

5.3 Methodology: TTEI

This study proposes a new index for the evaluation of trade and TR. Two main hypotheses are tested:

(a) TR is associated with international trade.

(b) TR is not associated with international trade.

5.3.1 Assumptions of the TTEI

This TTEI (Khan & Yusof, 2016) is based on the Omnia Mobilis assumption, which states that all relevant variables are important and should be accounted for in policy modeling. The reason for using the Omnia Mobilis assumption is to cover all possible variables in the study and incorporate any relevant variable (Ruiz Estrada, 2011). The DIS is constructed in the application of the Omnia Mobilis assumption (Ruiz Estrada, 2011). The DIS is not chaos; it is an unconditional and unexpected complex sensitive reaction to all possible uncertain occasions generated by controlled and uncontrolled variables concurrently found under irregular scenarios (Ruiz Estrada and Yap, 2013).

The following four steps are involved in the measurement of the TTEI.

$$\text{International Trade (T)} = f(\text{Terrorism (TR)}) \tag{5.1}$$

5.3.2 Step 1: Total Trade Volume

The total trade volume is the sum of exports and imports of a country in a given year.

$$\text{Total Trade Volume} = \text{Exports} + \text{Imports} \tag{5.2}$$

5.3.3 Step 2: Trade Growth Rate (ΔT)

Trade growth rate (DT) is defined as the difference between the trade volume of the present year and that of the preceding year divided by the trade volume of the preceding year.

The formula of the trade volume growth rate is as follows:

$$\text{Trade growth rate} = \left(\frac{\text{Tx - Tx -1}}{\text{Tx -1}} \right) \times 100 \qquad (5.3)$$

Where Tx is the current year trade volume, and Tx − 1 is the previous year's trade volume.

5.3.4 Step 3: TR Vulnerability Growth Rate (DTV)

Terrorism intensity is used as the measurement of terrorism. According to the GTD, the terrorism raw score of a country in particular year can be calculated as

$$TR = f(\ell INC + \hbar DTH + \pi INJ + \sigma PD) \qquad (5.4)$$

Where, $\ell = 1$, $\hbar = 3$, $\pi = 0.5$, and $\sigma = 2$, while INC stands for incident, DTH uses of deaths INJ applies for injuries and PD is applied for property damage in terrorist attack. The TR vulnerability growth rate (DTV) is defined as the difference between the score of terrorism of the present year and that of the previous year divided by the score of terrorism score of the previous year.

The mathematical formula of the given definition is as follows:

$$\Delta TV = \left(\frac{\text{TVx - TVx -1}}{\text{TVx -1}} \right) \times 100 \qquad (5.5)$$

Where TVx is the terrorism score in the current year, and TVx−1 is the terrorism score in the previous year.

5.3.5 Step 4: Trade–Terrorist Evaluation Analysis

For further study, the coefficient of elasticity (g) is calculated. The first derivative of function 1 can be written as follows:

$$f'(TV) = \frac{\Delta T}{\Delta TV} \qquad (5.6)$$

The function shows whether it is increasing or decreasing. The change in elasticity (η) is the change of slope. Therefore, we can take the second derivative of equation (5.6).

$$f''(TV) = \left[\frac{\Delta \dfrac{(\Delta T)}{\Delta TV}}{\Delta TV} \right] \tag{5.7}$$

The second derivative of Equation (5.7) shows whether the first derivative is increasing or decreasing.

As indicated in equation 5.1, trade is a function of terrorist attacks. Therefore, the integral of the function can be written as follows:

$$S = \int_a^b T\Delta TV \tag{5.8}$$

In this particular case, trade is a function of terrorist attack:

$$T = f(TV) \tag{5.9}$$

Therefore, by substituting equation (5.10) into equation (5.9), we obtain the function below:

$$S = \int_a^b f(TV)\Delta TV \tag{5.10}$$

This function is not continuous. Therefore, we can rewrite Equation (5.9) in the following form:

$$S = \sum_{i=1}^{n.} (Ti)\Delta TVi \tag{5.11}$$

Equation (5.11) shows the total area below the curve line.

Based on the above equations, the trade–terrorist evaluation analysis is measured as the trade growth rate divided by the terrorism intensity growth rate.

The general formula of the above definition is

$$\text{Trade terroristevaluation Index} = \frac{\%\Delta \text{ T}}{\%\Delta TV} \tag{5.12}$$

Equation (5.12) has three possible scenarios.

a) A TTEI greater than 1 shows that the response of terrorism to trade is more sensitive.

b) A TTEI less than 1 means that the response of terrorism to trade is less sensitive.

c) A TTEI equal to 1 means that the response of terrorism to trade is unitary.

If the trade openness (TO) is used as a trade indicator, then all the procedure will be the same as above, and the final equation will be look like below

$$\text{Trade Openness terroristevaluation Index (TOTEI)} = \frac{\%\Delta \text{ TO}}{\%\Delta TV} \qquad (5.13)$$

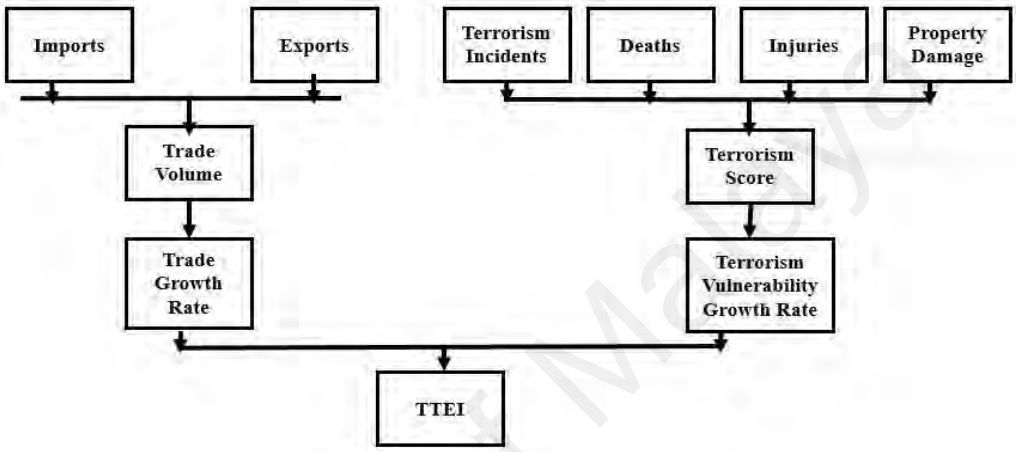

Figure 5.1: TTEI Flow Chart

5.4 TTEI Indicator Contributes to the Existing Literature

In the literature of international trade, various indices have been used to study international trade, such as terms of trade (TOT) (Balassa, 1985) and trade openness (Oi) (Edwards, 1998). All these indices TOT and Oi explain the international trade from the economic perspective. Even in the literature of trade and terrorism studies such as Nitsch and Schumacher (2004), the time series and panel data techniques have been used and there is no formal index was examined in the context of trade terrorism nexus.

However, TTEI examines the international trade from terrorism perspective. So far, no attempt has been made to develop an index to evaluate trade terrorism nexus. Thus, the uses of this methodology of TTEI is different from other techniques to measure the performance of the external sector. This index is a new approach that can be used to study international trade performance from a novel perspective. The main advantage of this

index is that it shows the impact of terrorism on international trade, either trade is more sensitive or less sensitive with respect to terrorism. On the basis of this sensitive analysis, the policy makers will make the policies for international trade promotion and anti-terrorism policies. In some economies, the trade may be less sensitive or less elastic to terrorism, while in some economies the trade may be more elastic (Figure 5.1).

5.5 Application of TTEI to Islamic countries

In this section, TTEI is applied to Islamic countries. The time period of analysis for TTEI is selected from the year 2004 to 2014. The basic reason of this time period selection is that the US attack on Iraq in 2003 and after that the number of terrorism incidents have been increased.

Table 5.1: Trade Terrorism relationship of Iraq Economy

Year	Δ Trade Growth Rate	Δ Terrorism Growth rate	TTEI
2004	-32.4	68.53	-0.473
2005	42.24	31.80	1.32
2006	86.75	75.69	1.14
2007	41.76	29.72	1.40
2008	106.98	-49.13	-2.17
2009	-12.17	23.84	-0.51
2010	-4.77	-15.49	0.30
2011	49.13	-13.04	-3.76
2012	10.31	19.51	0.52
2013	5.17	42.38	0.12
2014	-6.71	18.02	-0.37
`Average			-0.22

Source: Author's Own Estimations

In the case of Iraq economy, the trade growth rates for the Iraq economy are negative for four years and positive for seven years. The trade growth rates of the Iraq economy in 2004 to 2014 are -32.38%, 42.24%, 86.75%, 41.76%, 106.98%, -12.17%, -4.77%, 49.13%, 10.31%, 5.17 and −6.71%, respectively. Terrorism intensity growth rates for the Iraqi economy are positive for eight years and negative for three years in 2004–2014. The

TTEI values are positive for six years and negative for five years in 2004–2014. The values of TTEI in 2004 and 2005 are -0.08 and 1.32, respectively, which indicate less sensitivity in the year 2004, while more sensitive in the year 2005 according to our analysis. In 2006 and 2007, values of TTEI are 1.14 and 1.40, respectively, which show greater sensitivity. In 2008, the value of TTEI is -2.17, which is more sensitive. In 2009 and 2010, the values of TTEI are -0.51 and 0.30, respectively, which are less than 1 and show less sensitivity to the relationship between trade and terrorism. In 2012 and 2013, the values of TTEI are 0.52 and 0.12, respectively, which are less than 1 for the both of the year and are less sensitive. The value of TTEI for the year 2014 is -0.37, which explains less response of trade to terrorism (see Table 5.1 and Figure 5.2).

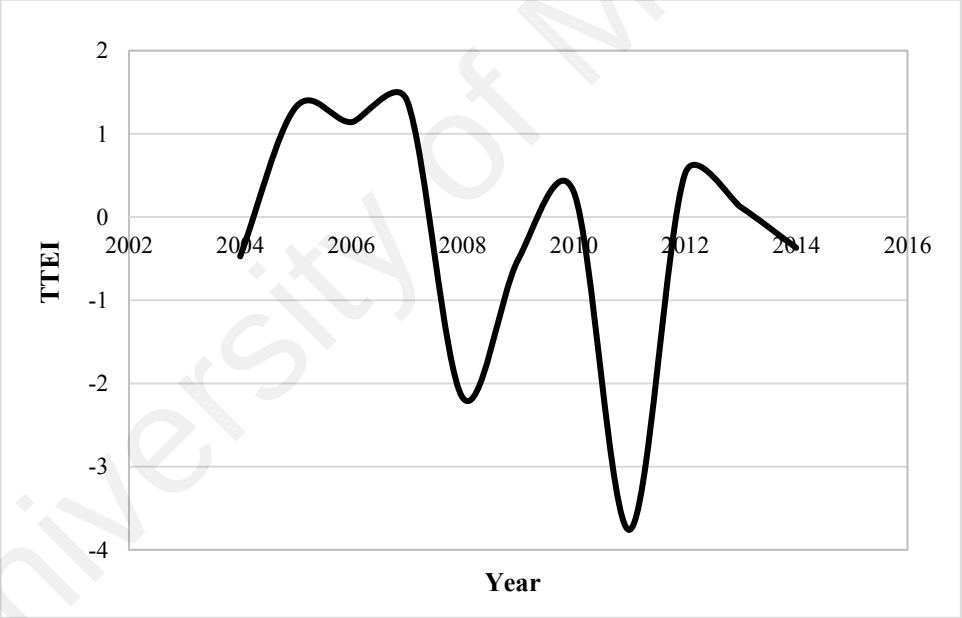

Figure 5.2: TTEI of Iraq Economy

When TO is used as an indicator for international trade, then the correlation between terrorism and trade openness is -0.74, which shows that there is negative correlation between terrorism and trade openness in the case of Iraq (see Appendix for the results of TOTEI).

In the case of Pakistan economy, the trade growth rates for the Pakistan economy are negative for two years and positive for nine years. The trade growth rates of the Pakistan economy in 2004 to 2014 are 15.84%, 20.12%, 24.17%, 27.47%, 30.78%, -22.16%, 13.10%, 15.42%, 5.35%, -0.19 and 12.25%, respectively. Terrorism intensity growth rates for the Pakistan economy are positive for seven years and negative for four years in 2004–2014. The TTEI values are positive for six years and negative for five years in 2004–2014. The values of TTEI in 2004 and 2005 are 0.11 and -0.33, respectively, which indicate less sensitivity in the year 2004, while more sensitive in the year 2005 according to TTEI analysis. In 2006 and 2007, values of TTEI are 0.15 and 0.10, respectively, which show less sensitivity. In 2008, the value of TTEI is --22.56, which is more sensitive. In 2009 and 2010, the values of TTEI are -0.43 and -21.16, respectively. In 2011, 2012 and 2013, values of TTEI are 2.74, -0.19 and 0.003, respectively, which are less than 1 for the two on the year 2012 and 2013 and are less sensitive. The value of TTEI for the year 2014 is 0.17, which explains less response of trade to terrorism. The average value of TTEI for Pakistan economy is -3.76 from the year 2004 to 2014. This average value of TTEI explains that on the average the elasticity of trade to terrorism is negative and greater than one. For the results of TOTEI of Pakistan economy see appendix (see Table 5.2 & Figure 5.3).

Table 5.2: Pakistan TTEI Analysis

Year	Δ Trade Growth Rate	Δ Terrorism Growth Rate	TTEI
2004	15.84	147.94	0.11
2005	20.12	-60.07	-0.33
2006	24.17	159.51	0.15
2007	27.47	273.46	0.10
2008	30.78	-1.36	-22.56
2009	-22.16	51.23	-0.43
2010	13.10	-0.62	-21.16
2011	15.42	5.64	2.74
2012	5.35	-28.49	-0.19
2013	-0.19	53.99	0.00
2014	12.25	70.71	0.17
Average			-3.76

Source: Author's Own Estimations

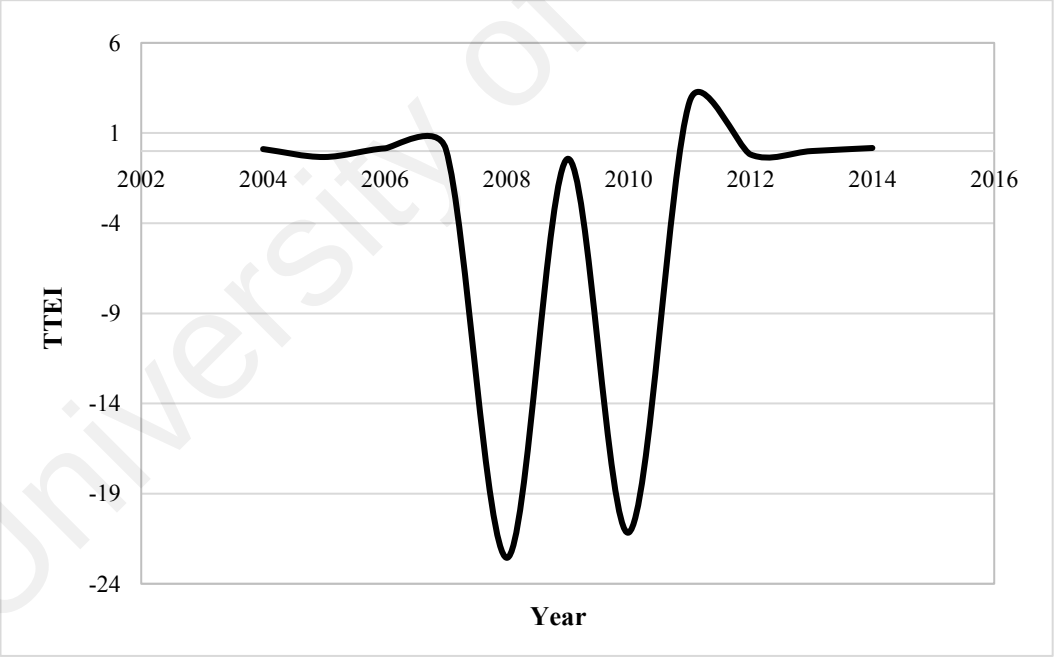

Figure 5.3: TTEI of Pakistan Economy

In the case of Afghanistan economy, the trade growth rates for the Afghanistan economy are negative for six years and positive for five years. The trade growth rates of the Afghanistan economy in 2004 to 2014 are -37.39%, 94.59%, -0.69%, 20.75%, 7.35%, 74.15%, 22.47%, -27.53%, -21.37%, -18.32 and -3.25%, respectively. The terrorism

intensity growth rates for the Afghanistan economy are positive for ten years and negative only for one year in 2004–2014. The TTEI values are positive for four years and negative for seven years in 2004–2014. The values of TTEI in 2004 and 2005 are -0.49 and 4,30, respectively, which indicate less sensitivity in the year 2004, while more sensitive in the year 2005 according to TTEI analysis. In 2006 and 2007, values of TTEI are -0.01 and 0.55, respectively, which show less sensitivity. In 2008, the value of TTEI is 0.50, which is less sensitive. In 2009 and 2010, the values of TTEI are 3.86 and -5.83 respectively. In 2011, 2012 and 2013, values of TTEI are -1.52, -0.54 and -1.90, respectively, which are greater than 1 for the two years 2011 and 2013 and are more sensitive. The value of TTEI for the year 2014 is -0.07, which explains less response of trade to terrorism. The average value of TTEI for Afghanistan from the year 2004 to 2014 is -0.43, which explains that the response of trade to terrorism on the average is negative (see Table 5.3 and Fig. 5.4). For calculations of TOTEI values for Afghanistan economy, see Appendix.

Table 5.3: Afghanistan TTEI Analysis

Year	Δ Trade Growth Rate	Δ Terrorism Growth Rate	TTEI
2004	-37.29	76.52	-0.49
2005	94.59	22.01	0.66
2006	-0.69	114.70	-0.04
2007	20.75	37.52	0.55
2008	7.53	15.09	0.55
2009	74.15	19.23	3.86
2010	22.47	-3.86	-5.83
2011	-27.53	18.12	-1.52
2012	-21.37	39.83	-0.54
2013	-18.32	9.65	-1.90
2014	-3.25	48.78	-0.07
Average			-0.43

Source: Author's Own Estimations

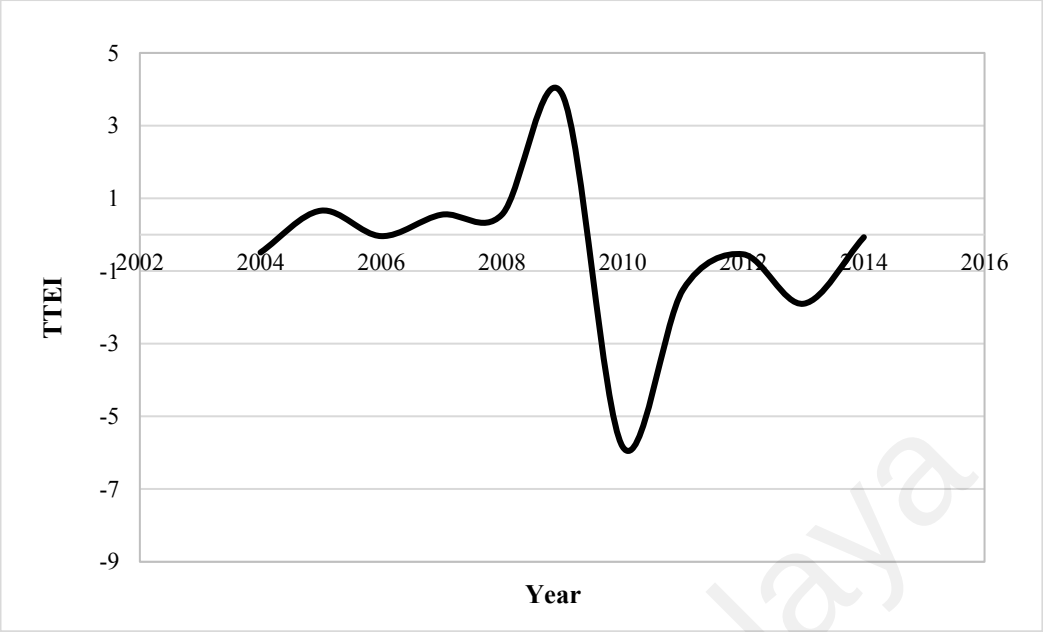

Figure 5.4: Afghanistan TTEI analysis

In the case of the Syrian economy, the trade growth rates for the Syrian economy are negative for six years and positive for five years. The trade growth rates of the Syria economy in 2004 to 2014 are -10%, 11.41%, 10.60%, 10.07%, 101.25%, -10.60%, 8.33%, -20.33%, -30.32%, -20.87% and -22.16%, respectively. The terrorism intensity growth rates for the Syrian economy are positive for seven years and negative for four years in 2004–2014. The TTEI values are positive for three years and negative for eight years in 2004–2014. The values of TTEI in 2004 and 2005 are -0.008 and -0.16, respectively, which indicate less sensitivity in both of the years according to TTEI analysis. In 2006 and 2007, the values of TTEI are 0.035 and -0.179, respectively, which show less sensitivity. In 2008, the value of TTEI is 0.12, which is less sensitive. In 2009 and 2010, values of TTEI are 0.12 and -0.41, respectively. In 2011, 2012 and 2013, values of TTEI are -0.003, -0.13 and -0.27, respectively, which are less than 1 for the all of the three years. The value of TTEI for the year 2014 is -0.25, which explains less response of trade to terrorism. On the average, the value of TTEI for the Syrian economy is negative, which can be interpreted as the response of trade to terrorism during the study period is

negative. (Table 5.4 and Fig 5.5). For the estimation of TOTEI values of the Syrian economy see appendix.

Table 5.4: Syria TTEI Analysis

Year	Δ Trade Growth Rate	Δ Terrorism Growth Rate	TTEI
2004	-10	10.5	-0.95
2005	11.41	-71.43	-0.160
2006	10.60	300.00	0.035
2007	10.07	-56.25	-0.179
2008	101.25	785.71	0.129
2009	-10.60	-83.87	0.126
2010	8.33	-20.00	-0.416
2011	-20.33	7493.75	-0.003
2012	-30.32	233.09	-0.130
2013	-20.87	74.97	-0.278
2014	-22.16	88.24	-0.251
Average			-0.19

Source: Author's Own Estimations

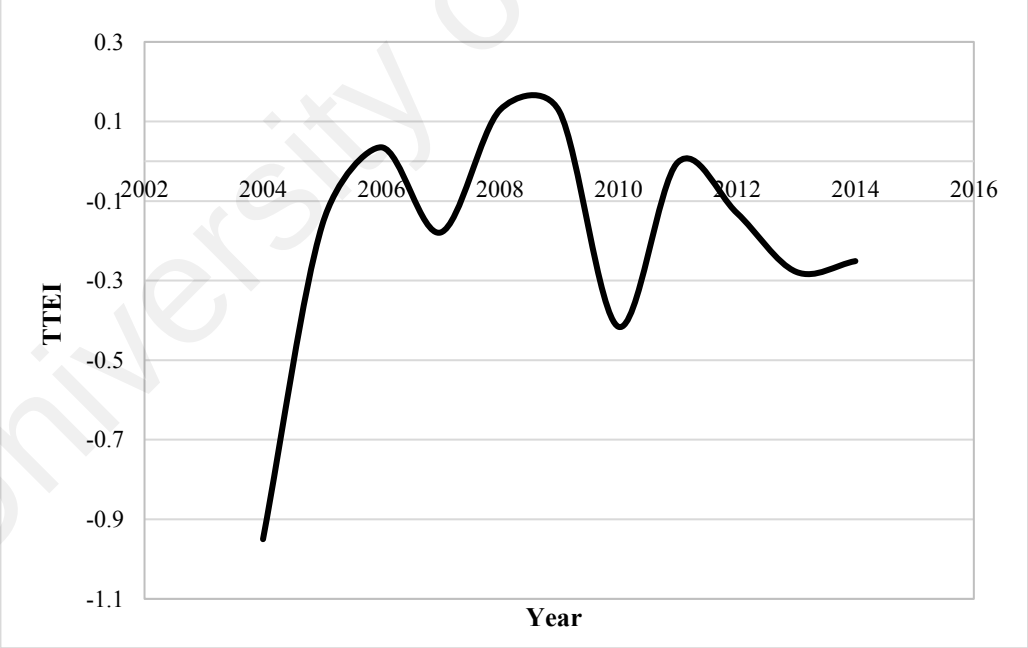

Figure 5.5: TTEI Analysis of Syria

Trade is more sensitive to terrorism in the case of Pakistan as compared to the rest of three Islamic countries (Afghanistan, Iraq and Syria). There are three main routs of international trade in the case of Pakistan. The possible reasons of more sensitivity of

trade to terrorism are that, firstly, in Pakistan the main terrorism incidents have been observed in KPK province, which is the main route of trade to Afghanistan and other central Asia economies. Secondly, Balochistan the other affected province of terrorism, where the Gwadar sea port, so also affects the international trade. Thirdly, the Karachi city in Sindh province of Pakistan is the main route for the sea trade and one of the highest terrorism incidents have been seen in this area of province of Pakistan. This part of the country has the biggest route which is used for the sea trade with the rest of the world (see Figure 5.6).

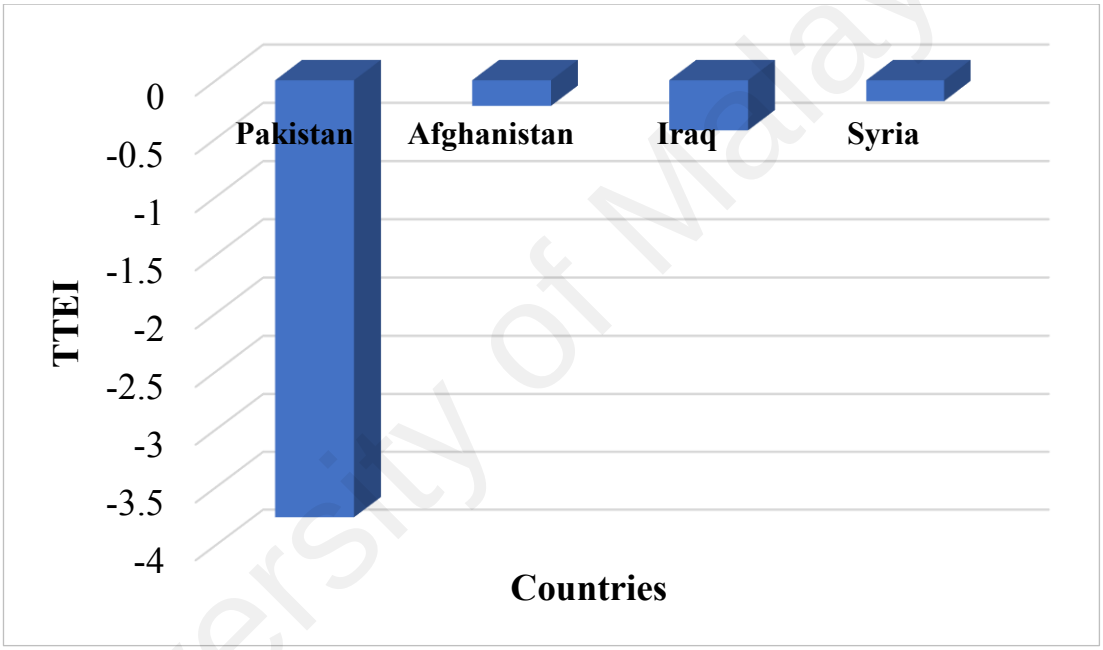

Figure 5.6: Comparison of TEEI among Four Islamic Countries

5.6 Econometric Analysis: Is Terrorism Related to International Trade?

This section applies the panel sample case of Iraq, Syria, Pakistan and Afghanistan to analyze the relationship between terrorism and international trade. The time period of study is from 1987 to 2014. For the measurement of international trade, we use trade openness (TO) (sum of exports and imports divided by GDP). The other economic variable of the model is real GDP (Y). These economic variable data are collected from the Penn World Table 8.1. To measure TR, we use the terrorism intensity (TR) calculated on the basis of GTD methodology.

The econometric model for the relationship between trade and TR is

$$TO = f(TR, Y) \qquad (5.14)$$

Where TO represents trade openness, and TR indicates terrorism and Y represents real GDP.

Table 5.5: Variables Description

Variables	Symbols	Measurement	Description	Data Source
Terrorism Intensity	TRI	TR=Killed+ Wounded+ Incidents+ Property Damage	Terrorism is indicated by the total number of individuals killed and wounded by acts of terrorism in a given year and country	GTD
Trade Openness	TO	(X+M)/GDP	Trade openness is measured as the logarithm of the sum of exports and imports divided by GDP	Pen World Table 8.1
Real GDP	Y	Constant US ($)	Economic Performance is measured by the rate of real GDP per capita growth in 2000 constant prices	Penn World Table 8.1

5.6.1 Methodology of the Econometrics Model

In panel data, it is necessary to test the data for stationarity through unit root tests. The general test of regression can be expressed as below;

$$Y_{i,t} = \alpha_{i,t} + \gamma_i y_{i,t-1} + \varepsilon_{i,t} \qquad (5.15)$$

Or on the other hand, it can be written as

$$\Delta y_{i,t} = \alpha_{i,t} + \Pi_i y_{i,t-1} + \varepsilon_{i,t} \qquad (5.16)$$

The null hypothesis (H0) is that all the series has a unit root means null hypothesis H0: $\Pi_I = 0$.

The alternative hypothesis is that all series are stationary, which means H1: $\Pi_I < 0$ (Levin & Lin, 1992).

The other additional unit root tests have been introduced by Levin, Lin and Chu (2002), the ADF (Augmented Dickey-Fuller) Fisher test (Maddala & Wu, 1999), IPS (Im, Pesaran & Shin, 2003) and the tests by Breitung and Meyer (1994). The different unit root tests are applied, some are allowing to include heterogenous coefficients, while some tests can handle unbalanced panel data. Actually, the panel unit root tests are divided into first and second generation tests (more than one grouping variables), where the first-generation tests consider that the sections are independent, whereas second generation tests allow for dependence between sections (Hurlin & Mignan, 2004).

Once the order of integration is determined on the basis of panel unit root test, the next step is to examine long run and short run relationship among the variables of the model. The panel ARDL (Pesaran, Smith & Shin, 1997; and Peseran et al., 2001) approach applies to examine the relationship between terrorism and international trade. The basic equation of panel ARDL(p,q) as below

$$Y_{i,t} = \alpha_{0i,t} + \alpha_{1i,t} + \sum_{i=1}^{p} \Phi_i Y_{it-1} + \mathrm{B}^{/} X_{i,t} + \sum_{i=0}^{q-1} \mathrm{B}^{*} \Delta X_{i,t-1} + \mu_{i,t} \qquad (5.17)$$

$$\Delta X_{i,t} = P_1 \Delta X_{i,t-1} + P_2 \Delta X_{i,t-2} + P_i \Delta Xi_{t-i} + + \varepsilon_{i,t} \qquad (5.18)$$

5.6.2 Results of the Econometric Model

The econometric results are arranged in the sequence such as correlation matrix, unit root results followed by long run coefficient and results of short run. The granger causality results are shown in the last part.

Table 5.6: Correlation Matrix

Variable	LNTO	LNTR	LNY
LNTO	1		
LNTR	-0.18	1	
LNY	-0.26	0.40	1

Source: Author's Own Estimations

The panel unit root tests are applied to examine the order of integration of all the series. The unit root tests LLC, IPS, ADF-Fisher and PP-Fisher are applied to investigate the order of integration of all variables in the model.

Table 5.7: Panel Unit Root Test Results, Four Islamic Countries

At Level I(0)					
Variable	LLC	IPS	ADF-Fisher	B	PP-Fisher
LNY	-0.7(0.23)	0.93(0.82)	7.10(0.52)	1.37(0.92)	4.57(0.80)
LNTO	0.71(0.76)	1.08(0.63)	1.59(0.58)	1.38(0.91)	1.47(.82)
LNTR	1.09(0.86)	2.27(0.98)	1.76(0.98)	-1.25(0.11)	2.76(0.94)
At First Difference I(I)					
LNY	-2.2(0.01)**	-2.78(0.00)***	26.30(0.00)***	-.23(0.01)**	41.2(0.00)***
LNTO	-3.4(0.00)***	-3.26(0.00)***	25.05(0.00)***	-4.4(0.00)***	60.2(0.00)***
LNTR	-5.1(0.00)***	-5.07(0.00)***	39.85(0.00)***	-6.0(0.00)***	66.5(0.00)***

Note: ***, ** indicate significance level at 1% and 5% respectively.

The results of unit root tests for panel study conclude that all variables are not significant at 1% level. After taking the first difference of all the variables, it is observed that all variables of the study become stationary.

Table 5.8 explains the long-run and short-run coefficients results of model, where trade openness (TO) is dependent variable, while terrorism and real GDP are independent variables.

Table 5.8: Panel ARDL long-run coefficients and Short Run Coefficients, Dependent variable, LNTO

Variables	Coefficient	t- statistic
LNTR	-0.046***	-5.51
LNY	0.20**	1.98
Short Run Coefficient Values		
D(TO)(-1)	0.045	0.70
D(TO)(-2)	0.07	0.57
D(TR)	-0.05***	-3.17
D(TR)(_1)	-0.06**	-2.55
D(TR)(-2)	-0.06***	-2.07
D(TR)(-3)	-0.032**	-1.92
D(TR)(-4)	-0.04***	-2.08
D(Y)	-0.02	-0.10
D(Y)(-1)	0.17	1.08
D(Y)(-2)	0.017	0.10
D(Y)(-3)	0.30	0.94
D(Y)(-4)	0.11	0.54
C	-3.66**	-2.75
ECT	-0.67**	-2.75
AIC	-1.43	
HQC	-0.85	
SC	-0.01	
Log likelihood	137.55	

Note: ***, **, *, show Significant level at 1%, 5% and 10% respectively

The lag length selection criteria are based on AIC, HQC and SC. Among these three indicators, the AIC has the lowest value -1.43, so the lag length is selected on the basis of AIC. The long-run coefficients of the panel ARDL model is estimated to confirm the link between international trade and terrorism. The model results show a statistically significant and negative relationship between international trade and TR in the case of Islamic countries. A 1-point increase in terrorism decreases international trade by 0.046 points (Table 5.8). Any catastrophic terrorist attacks can affect business and consumer confidence, thereby harming investment, consumption, and macroeconomic performance including international trade. Terrorist attacks that target vital infrastructures, such as oil pipelines or railroads, can seriously disrupt transportation, communication and in this way, it affects the international trade. The relationship between trade and terrorism in the

study is supported by the literature of Nitsch and Schumacher (2004) and confirms that terrorism has negative and significant impact on international trade. Moser et al. (2008) study also supports our results of model and explains that terrorism negatively affects international trade. The study of Blomberg et al (2004) explains that terrorism and trade openness has a negative and significant relationship by applying the panel data technique. For the policy implication, the results explain that terrorism has a negative impact on international trade of the selected Islamic countries, so the developed economies may provide special preferences to boost up the trade of these economies. The control variable of the model is real GDP. The coefficient value of the control variable is positive and according to the theory. The relationship between trade openness and real GDP is positive and significant and confirms that the increase in real GDP will bring positive change in the trade openness. The results of the model are according to the H-O theory application as mentioned in the literature by McKenna (2005) that how terrorism negatively affects international trade by increasing the transaction cost.

Table 5.9: Granger Causality Test Results

Null Hypothesis:	Obs	F-Statistic	Prob.
TERRORISM_INTENSITY does not Granger Cause TRADE_OPENNESS	101	3.28851	0.0416
TRADE_OPENNESS does not Granger Cause TERRORISM_INTENSITY		0.68075	0.5087
GDP__2005_ does not Granger Cause TRADE_OPENNESS	104	5.51353	0.0054
TRADE_OPENNESS does not Granger Cause GDP__2005_		0.13132	0.8771
GDP__2005_ does not Granger Cause TERRORISM_INTENSITY	101	0.13789	0.8714
TERRORISM_INTENSITY does not Granger Cause GDP__2005_		1.68554	0.1908

The granger causality test confirms that terrorism can cause trade openness as well as the real GDP can cause trade openness. Granger-causality test indicates that there is a

unidirectional causality running from terrorism to trade openness, and real GDP to trade openness.

5.7 Conclusion

This new TTEI examines the relationship between trade and terrorist attacks. This index is a new approach that can be used to study international trade performance from a novel perspective. The application of TTEI to the economies of the Islamic countries explains the responsiveness of trade–terrorist attacks and evaluates the trade–terrorist attack relationship in a particular year, that is, whether it is more sensitive or less sensitive. The panel econometric analysis of the study for four Islamic economies (Pakistan, Afghanistan, Iraq and Syria) indicates that terrorism affects international trade negatively and significantly. This study can add new insights into the literature on international trade and provide a novel idea of measuring the trade–terrorist paradox. The developed world may enhance trade opportunities to terrorism affected economies along with financial aid. The advance economies may also provide more provision and preferences in the case of international trade to the terrorism effected economies.

CHAPTER 6: TERRORISM AND ECONOMIC PERFORMANCE

6.1 Introduction

After discussing the measurement of terrorism at the provincial level, the cause of terrorism at the provincial level, and the trade-terrorism nexus, chapter 6 explains the effects of terrorism on economic growth at the macro level. Terrorism is commonly viewed in historical, sociological, psychological, political, or geopolitical terms. The phenomenon of terrorism is not monolithic, but is rather diverse with regard to ideology, association, and origin. However, acts of terrorism-regarding of the motivations behind them-can have extensive economic impacts. Catastrophic terrorist attacks, such as 9/11, can affect business and consumer confidence, thereby harming investment, consumption, and macroeconomic performance. The main targets of terrorist attacks are vital infrastructure, such as oil pipelines or railroads, that can seriously disrupt transportation, communication, and consequently the whole country. Various channels exist through which the targeted economy can be affected by terrorism. The economic costs of terrorism also include the diversion of FDI, capital loss, transfer of resources from developmental expenditure to the security sector, and reduction of international trade. The work of Sanders and Enders (2008) emphasizes that the effect of FDI loss in a developing country is threatening because FDI is the main source of savings; consequently, economic growth shrinks. This capital flight from terrorist-affected economies is the same as the effect of civil war (Collier et al., 2003; Sandler & Enders, 2008).

Terrorism may affect the whole region where the targeted economy is geographically located. This scenario is similar to civil conflicts, in that it may generate spillover costs to neighboring countries. A terrorist campaign in a neighboring economy dampens capital inflows. This regional multiplier results in lost economic activities in terrorism-affected economies and affects the whole region. Drakos (2004) and Ito and Lee (2005) determine that terrorism affects the whole economy and, in some cases, specific sectors (e.g., the

decline in the profit of airlines and the reduction in the number of tourists after 9/11). Another economic cost of terrorism is the increase in security expenditures. For example, after the 9/11 attack in the United States, a large amount of the budget was spent on the Department of Homeland Security). In 2015, about 54% of the U.S. budget, which was equal to US$ 598 billion, was allotted to military expenditure (Enders & Sandler, 2006). Terrorism also increases the cost of doing business and trade because of the increase in insurance premiums, expenditures on the purchase of security equipment, and increases in the salaries of employees who are exposed to risks.

Along with other social and political factors, terrorism has economic consequences and economic causes. The main causes of terrorism are multidimensional, extending from religious extremism to a sense of alienation from society to anger at perceived geopolitical injustice. However, economic factors can help explain the rise of terrorism. Economic stagnation can generate higher unemployment and less economic opportunities for the younger population in the economy. Among all, the lack of economic opportunities can be a powerful driver of terrorism (particularly in conjunction with other social and political factors). This issue has received more attention in those countries where the population is relatively young. Therefore, populations with large proportions of youth and high unemployment among that segment provides fertile recruiting grounds for terrorist groups.

Despite the sizable economic causes and consequences of terrorism, formal models of the economics of terrorism are few. However, formal models can help researchers in understanding the economic dimensions of terrorism. Moreover, in the literature on terrorism, very few studies have been attempted on the modeling side. For example, Sandler and Lapan (1988) introduced a multi-period model built on a non-negotiation outline. They further explained that terrorists are rational actors, and that their decision to either go for or refrain from terrorism is based on a cost-benefits analysis. Studies by

Islam and Shahin (1989) and Shahin and Islam (1992) argued that there are no such strategic relations and responses between rivals. The idea of introducing an alternative model is to better understand the terrorism problem and to help develop anti-terrorism policies. The present work mainly aims to evaluate the economic consequence on economies in the context of a terrorist attack by presenting the TAVE model (Ruiz, Estrada, Park, Kim & Khan, 2015).

The rest of the chapter is organized as follows: Section 2 explores the different theoretical frameworks of terrorism. Section 3 discusses the methodology of the TAVE indicator (Ruiz, Estrada, Park, Kim & Khan, 2015). Section 4 explains the difference between the TAVE indicator and the literature studies. Section 5 reports the results of the application of the TAVE model to four Muslim countries (Pakistan, Afghanistan, Iraq and Syria). Section 6 presents the methodology and results of the econometric analysis of the determinants of terrorism in Muslim countries (Pakistan, Afghanistan, Iraq and Syria). Section 7 concludes with some final observations.

6.2 Theoretical Framework of Terrorism

Existing literature by Keynes (1919), Pigou (1940), and Robbins (1942) has examined the role of war, peace, and disputes on an economy. Blomberg, Hess, and Orphanides (2004) reported that the issue of terrorism has gained noteworthy consideration among researchers after the 9/11 incident. Economists have realized that terrorists are rational individuals who want to maximize their objectives with respect to the available resource constraints (Landes, 1978; Sandler, Tschirhart, & Cauley, 1983). The association between terrorism and economic performance can be best described by rational choice theory. Within this framework, there are two main players: one is the terrorist and the second is the government. A government suffering from terrorist attacks must rationalize its decision to compete with terrorists. The government must compare the cost of accepting

terrorist demands against the cost of a prolonged terrorist campaign that results in continuous resistance by the government (Sandler & Enders, 2008).

The economic impact of terrorism is also related to the size of the GDP and the diversification of its economic sectors. The US Department of State Fact Sheet (2002) states that Yemen's shipping sector was seriously affected by the terrorist attacks on the USS Cole and MV Limburg. The competitive advantage was shifted to Djibouti and Oman because of those terrorist attacks. Insurance premiums increased by 300% in Yemen. The average per-month loss to the shipping industry of Yemen was $3.8 million. This type of economic cost has drastic effects on economies with low GDPs because the affected sectors represent significant shares of overall production. People lose their jobs because terrorism has a significant effect on countries with slightly developed economies compared with countries with significantly developed economies.

Compared with slightly diversified economies, diversified and advanced economies are less affected by terrorism because the temporary effect shifts resources from the affected sector to another sector. The problem in slightly diversified economies is that their resources are concentrated in only a few sectors. If terrorism affects any of these few sectors, then the whole economy will come under the influence of terrorism. The other issue in the slightly developed economies is that their exports are concentrated within only a relative handful of goods. If these few sectors are targeted by terrorists, then the country's foreign exchange earnings are negatively affected and the ability to boost other sectors of the economy is limited.

Similarly, Hussain (2003) examines this issue in his work titled "Terrorism, Development, and Democracy: The Case of Pakistan." Some causes of terrorism are identified from the historical study of the Pakistan economy. According to the author, if Pakistan seeks to become a moderate and modern Muslim country, then it should

eradicate poverty and illiteracy to overcome the terrorism issue. Two causes of terrorism identified in the Pakistani economy are illiteracy and poverty. Similarly, Testas (2002) argues that when the economy does not perform well, the economic indicators are on the declining side and the standard of living of people decreases. This economic instability causes people to start protesting against the government and against the ruling party. Therefore, this argument suggests that economic conditions are the root causes of terrorism. Similarly, Blomberg et al. (2004) present an economic model of terrorism in which they examined the idea that limited access to economic resources increases the probability of joining terrorist groups because, ultimately, the opportunity cost of terrorism decreases.

6.3 Methodology of the TAVE Technique[7]

The methodology of the TAVE technique (Ruiz, Estrada, Park, Kim & Khan, 2015*)* is divided into three segments. The first part of the model discusses the origins of the terrorist attack. The second segment of the model explains the terrorist attack. And the third part of the model is related to post-terror effects (see Figure 6.1). Moreover, the TAVE technique uses two different groups of players. The first player (P_1) is the civil society formed by workers, government sector and private sector. The second player (P_2) can be any terrorist group involved in terrorist activities in that economy. A terrorist attack is characterized as the physical or psychological attack of an armed group or gang on the civil society (Ruiz Estrada and Park, 2008). Consequently, a terrorist attack utilizes violent and destructive activities with no leniency or sympathy for the common people. A terrorist attack uses complex strategies, procedures, and frameworks of violence and

[7] The methodology of TAVE Model (Ruiz Estrada, Kim, Park & Khan, 2015) has been published with the title "The Economic Impact of Terrorism: A New Model and Its Application to Pakistan" in Journal of Policy Modeling, that's why the Author has citied in this part of the chapter.

violence to threaten and degrade the general public (see for details the paper work Ruiz Estrada et al., 2015).

6.3.1 Origins of a Terrorist Attack

According to the TAVE technique, the origin of a terrorist attack depends on four basic factors: (i) historical issues (ῖ); (ii) economic issues (έ); (iii) ideological and religion differences (Λ); and (iv) civil society control (μ). These four aspects directly influence "the level of terrorist attack tension (ζ)" in this model. The level of terrorist attack tension (ζ) is derived from these four factors (Expression 6.1)

$$\zeta = f\,(ῖ, έ, \Lambda, \mu) \qquad (6.1)$$

Where,

(ζ)= Terrorist attack tension,

ῖ = Historical Issue,

έ= Economic Issues,

Λ= Ideological and Religious Differences; and

μ= Civil Society Control.

To find out the optimum level, the optimization technique derivatives are applied (see Ruiz Estrada et al., (2015), how it works and calculated).

6.3.2 The Terrorist Attack

The second stage of the TAVE model is related to the terrorist attack. At this stage of the model, the pre-attack and post-attack strategy between the two players is explained. The terrorist attack has been further divided into two phases: the preparation stage and the attack stage

6.3.2.1 Terrorist Attack Preparation Stage

In the pre-attack stage, it is necessary to explain that both players $(P_1 \wedge P_2)$ have different measures levels to execute their plan (6.2).

$$P_1(\omega_1) \neq P_2(\omega_2) \qquad (6.2)$$

Where,

$P_1(\omega_1)$ = The strategy of the first player, and

$P_2(\omega_2)$ = The strategy of the second player.

With regard to how both players plan and execute the strategy, see the methodology of the model as already mentioned in the citation.

6.3.2.2 The Terrorist Attack

The TAVE approach assumes that if a terrorist goes to attack on Player 1 (P_1), in that case the economic desgrowth ($-\delta$) can be large but in different magnitudes P_1 ($\Delta-\delta$). The intensity of the terrorist attack (α_i) is going to affect total economic leaking (Ω_t). Similarly, economic desgrowth ($-\delta$) and terrorist attack losses ($-\pi$) will follow the same trend. Nine variables are used to measure the intensity of a terrorist attack (α_i). These nine variables include (i) military external support (α_1); (ii) anti-terrorist attack technological systems (α_2); (iii) army size (α_3); (iv) strategy, information, and logistic systems (α_4); (v) favorable natural and geographical conditions (α_5); (vi) civil society support (α_6); (vii) the terrorist group knowhow (α_7); (viii) transportation, communications, and IT systems (α_8); and (ix) industrial structures (α_9). The TAVE model also assumes that in the long run, economic desgrowth ($-\delta$) and terrorist attack losses ($-\pi$) can pose significant difficulties to the recovery of Player 1 (P_1) (in different magnitudes) in the post-attack stage.

$$| J^{'}(\alpha_i) | = \begin{pmatrix} \partial\alpha_i/\partial\alpha_1 & \partial\alpha_i/\partial\alpha_2 & \partial\alpha_i/\partial\alpha_3 \\ \partial\alpha_i/\partial\Lambda & \partial\alpha_i/\partial\alpha_5 & \partial\alpha_i/\partial\alpha_6 \\ \partial\alpha_i/\partial\Lambda & \partial\alpha_i/\partial\alpha_8 & \partial\alpha_i/\partial\alpha_9 \end{pmatrix} \quad (6.2)$$

The final evaluation is explained in Expression 6.4.

$$\alpha_i = 1 / | J^{'}(\alpha_i) | \quad (6.4)$$

Consequently, the economic wear (Π) that is generated due to a terrorist attack depends on changes in economic desgrowth (-δ) and terrorist attack losses (-π), as expressed in equation 6.5.

$$\Pi = f(-\delta,-\pi) \quad (6.5)$$

The last stage is to compute the total economic wear (Π) due to a terrorist attack, conferring to expression 6.6.

$$\Pi=\left[\int_0^1 \Omega_t\,(\alpha i)^{-nt}\,dt\right]+\left[\int_0^1 \Omega_t\,(-\pi)^{-nt}\,dt\right]-\left[\int_0^1 -\delta\,(\alpha i)^{-nt}\,dt\right]+\left[\int_0^1 -\delta(-\pi)^{-nt}\,dt\right] \quad (15) \quad (6.6)$$

6.3.2.3 Post-Terrorist Attack Effect

In the post-attack stage, Player 1 (P_1)—the government—is the final loser. Player 1 suffers a lot of economic leaking (Ω_T), losses (-π), and economic desgrowth (-δ) in the similar time of the terrorist attack, as per expression 6.12. (For more details, see the model reference.)

$$P_1(-\pi, -\delta, \Omega_T) < P_2(-\pi, -\delta, \Omega_T) \quad (6.7)$$

Where,

Ω_T = economic leaking.

Losses = -π; and

-δ = economic desgrowth

6.3.3 Economic Desgrowth

In this part of the methodology, the idea of economic desgrowth (-δ) (Ruiz Estrada, Yap, & Park, 2014) is discussed, which plays an imperative part in the development of the TAVE model. The primary goal of economic desgrowth (-δ) is to make an economic indicator that can assist in investigating how controlled and non-controlled shocks can severely affect GDP in the short run. The term "economic desgrowth (-δ)" can be defined as "an indicator that can show different leakages that is originated from controlled and non-controlled events that can affect the performance of the final GDP formation into a period of one year." The TAVE model assumes that the world economy is always in a condition of permanent chaos and is susceptible to various levels of vulnerability according to different magnitudes of anomalies. Economic desgrowth (-δ) applies random intervals; subsequently, analyzing unexpected shocks from different controlled and non-controlled events becomes conceivable. These shocks cannot be anticipated and observed easily through traditional methods of linear and non-linear models. The reason is that we assume at the outset that the world economy is in permanent chaos (Gleick, 1988). In the meantime, the TAVE technique (Ruiz, Estrada, Park, Kim, & Khan, 2015) incorporates Lorenz transformation assumptions (Lorenz, 1993) to encourage the analysis of economic desgrowth (-δ). The final dimension of total economic leaking (Ωt) is determined by applying a large number of multidimensional partial derivatives on each variable (16 variables) to assess the changes in each variable (16 variables) between the present time (this year) and the past time (last year). Finally, the calculation of economic desgrowth (-δ) is based on the final real GDP and (or) total economic leaking (Ωt). This area of the TAVE model demonstrates that total economic leaking (Ωt) always affects the economic desgrowth (-δ) behavior. Lastly, modeling of economic desgrowth (-δ) depends on the application of the Omnia Mobilis assumption by Ruiz Estrada (2011). The main idea of

this assumption is to create a relaxation of the total economic leaking (Ωt) calculation (non-controlled and controlled events) and the full potential GDP (OP).

6.4 TAVE Model Contributes to the Existing Literature

Most of the terrorism and economic performance studies in the literature are based on the traditional methodologies such as time series analysis and panel analysis. In these studies, many control variables are used to examine the relationship between terrorism and economic performance. The aspects to quantify the leakages from the economic growth rate due to terrorism are ignored as most of the study is based on the cause and effect relationship. For example, studies such as Abadie and Gardeazabal (2003), Chen and Siem (2004), Gaibulloev and Sandler (2008) and Sandler and Enders (2008) applied the classical and traditional methodologies to discover the relationship between the economic growth rate and terrorism. The combined conclusion on all of the said studies is that the authors have worked and studied the relationship between terrorism and economic performance econometrically, but have not worked on the formal modeling of the economics of terrorism.

However, the methodology of the TAVE technique draws on an alternative mathematical and graphical approach. The application of the TAVE technique (Ruiz, Estrada, Park, Kim & Khan, 2015) is applied from a terrorist attack of Player 2 (P_2) on Player 1 (P_1) to illustrate and illuminate the economic impact of terrorism. The TAVE technique can enable the evaluation of terrorist attacks systematically and accurately. In particular, this model can help to improve the measurement of the economic effects of terrorism. An important added value of the TAVE technique is that it accounts for the uncertainty and the behavioral change from a new perspective within the framework of a dynamic imbalanced state (DIS) (Ruiz Estrada and Yap, 2013) and Omnia Mobilis assumption (Ruiz Estrada, 2011). The idea of the TAVE model is different from classical economic models, such as linear and non-linear models. The approach of the TAVE

model is a new economic mathematical modeling and mapping of terrorist attacks through high-resolution multidimensional graphs and a new mathematical framework. Similarly, the idea of the model is that it explicitly differentiates between the pre-attack and post-attack phase. It interprets that the alternative analytical framework of the TAVE model can yield new, fascinating, and relevant insights into accurately assessing the economic consequences of a terrorism.

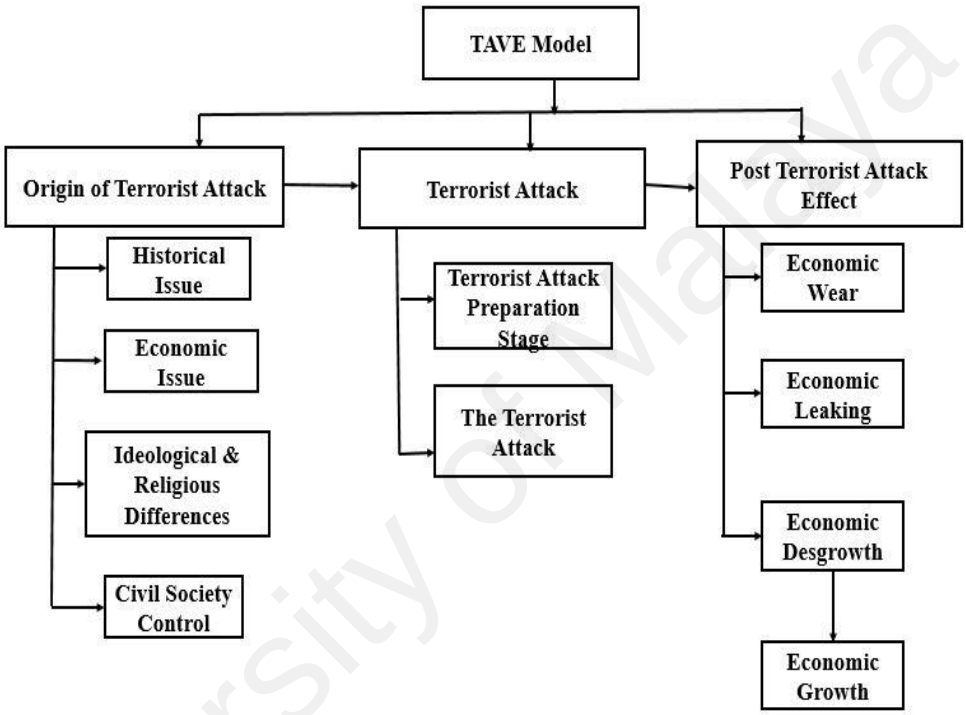

Figure 6.1: TAVE Model Flow Chart

6.5 Application of the TAVE Technique to Islamic Countries (Pakistan, Afghanistan, Iraq and Syria)

The TAVE model (Ruiz Estrada, Park, Kim & Khan, 2015) is applied to four Islamic countries (Pakistan, Afghanistan, Iraq and Syria). Firstly, it is applied to economy of Pakistan. In case of Pakistan, the terrorist attacks took place between the Pakistani government (P_1) and domestic terrorist groups (P_2) in Pakistan; while in the case of Afghanistan, the terrorist attacks are carried out between the Afghani government and the terrorist groups in Afghanistan. Similarly, in the case of Iraq, the insurgent attacks took

place between the Iraqi government (P_1) and domestic terrorist groups; (P_1) and in Syria, it is happened between the Syrian government (P_1) and domestic terrorist groups (P_2) in both of the economies. The tension between the two players in each of the mentioned economy has recently been intensified as clearly mentioned in different literature and in the various issues of GTD reports. Underscoring the tension is the unrelenting ascent of the Pakistani government as the main actor to terrorism effects and a corresponding relative expansion of terrorist groups in Pakistan. Similarly, the terrorist groups in Afghanistan are the Taliban groups who have occupied more than 50% of the country. In the same way, in the economies of Iraq and Syria, as the ISIS terrorist group expands day by day. The intention is to evaluate the effects of a terrorist war between the government of these four economies and terrorist groups by applying the TAVE technique. The example uses four different players for each economy. The first group of players includes the main conflict players, namely, the Pakistani government (P_1) and domestic terrorist groups in Pakistan (P_2). The second group of players includes the external players, namely, the United States (P_3) (which supports P_1) and international terrorist groups (P_4) (which support P_3). In the same way, the players in the war of terrorism in Afghanistan are the Afghani government (P_1) and domestic terrorist groups in Afghanistan (P_2). The second group of players includes the external players, namely, the United States (P_3) (which supports P_1) and international terrorist groups (P_4) (which support P_3). Similarly, the four main players in the Iraq and Syria economies are the governments of the respective economies, domestic terrorist groups in both of the economies, the internal supporter to the government of Iraq and Syria (like the U.S.) and international terrorist groups from the rest of the world which support ISIS.

Table 6.1: Application of the TAVE Technique to Pakistan

Variables	1980s(Pre-9/11)	1990s (Pre-9/11)	Post 9/11
Military Tension (MT)	0.15	0.29	0.75
Economic Leaking (EL)	0.18	0.45	0.75
Average Economic Wear (AEW)	0.20	0.50	0.78
Economic Desgrowth (-δ)	−0.15	−0.49	−0.87

Source: (Ruiz Estrada, Park, Kim & Khan, 2015)

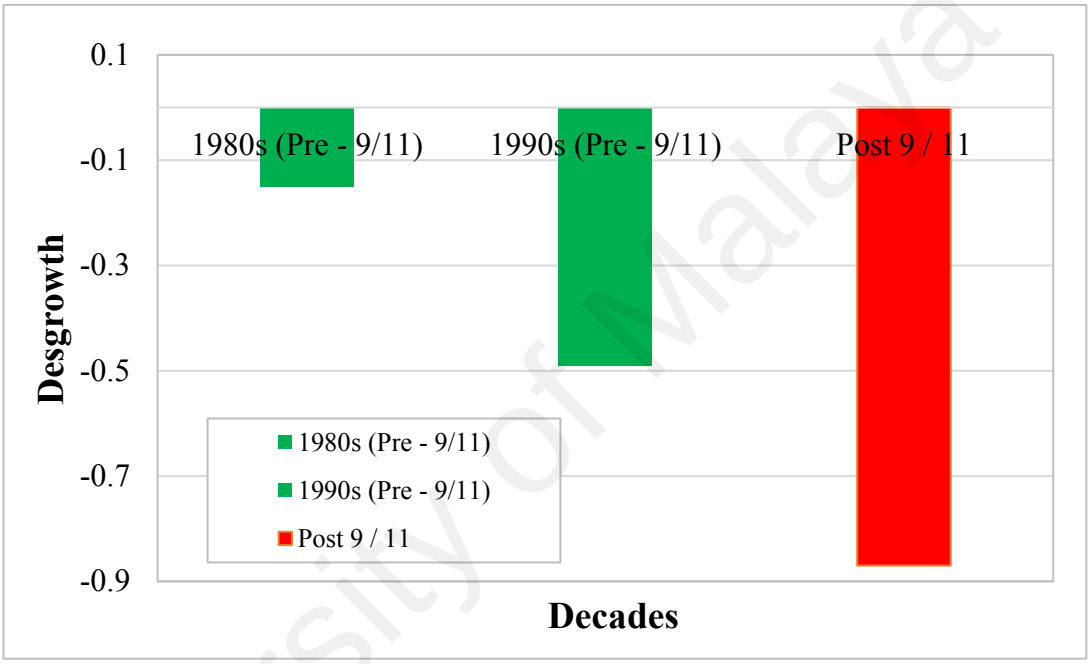

Figure 6.2: Comparison of Economic Desgrowth between Pre-and Post-9/11 of Pakistan Economy

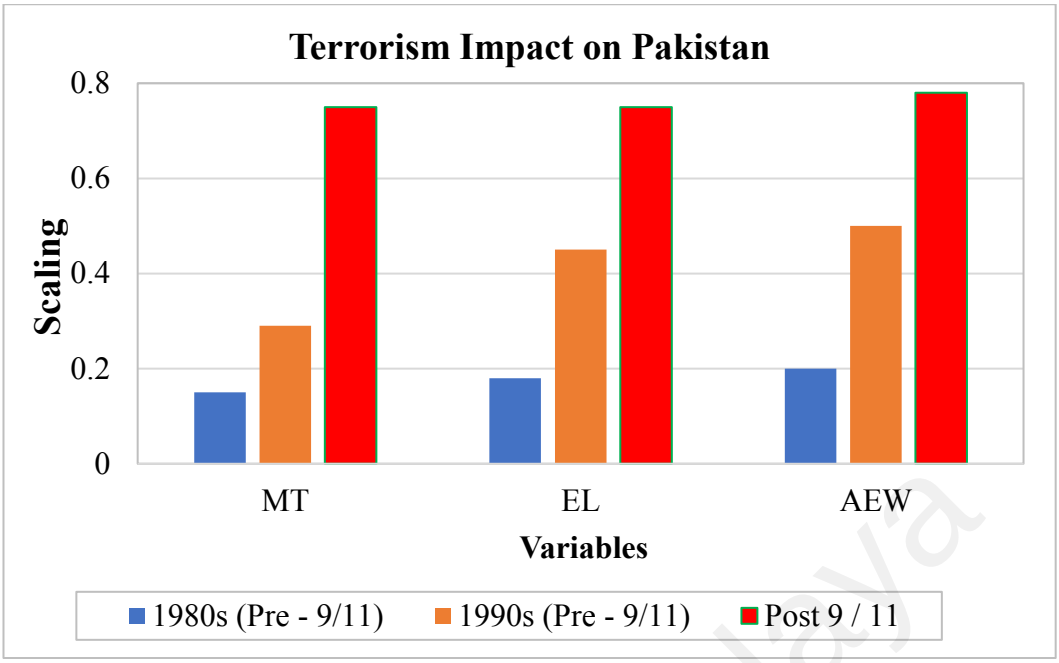

Figure 6.3: Comparison of MT, EL and AEW between Pre-and Post-9/11 of Pakistan Economy

The TAVE indicator assumes that P_1 (the Pakistani government) obtains support from the United States (P_3). It also assumes that P_2 (domestic terrorist groups in Pakistan) obtains support from international terrorist groups (P_4). The following are the three main elements that can precede a war between P_1 (the Pakistani government) and P_2 (domestic terrorist groups in Pakistan): (i) historical issues stemming from the cold war, (ii) rapid expansion of extremist terrorist groups in Pakistan from Afghanistan and terrorist groups from neighboring countries, and (iii) rivalry for political supremacy and hegemony in the control of Pakistan. These factors jointly generate a high level of terrorism tension between both players P_1 and P_2. According to the TAVE methodology, the level of military tension between P_1 (the Pakistani government) and P_2 (domestic terrorist groups in Pakistan) increased from 0.29 in 1990 to 0.75 in 2015. The average economic leaking (Ω_t) from the terrorist war was 0.18 in the 1980s, 0.45 in the 1990s, and 0.75 in 2015. Economic desgrowth (-δ) averaged −0.15 in the 1980s, −0.49 in the 1990s, and −0.87 in 2015. Average war economic wear (Π) was 0.20 in the 1980s, 0.50 in the 1990s, and 0.78 in 2015. Conversely, if war intensifies between these two players, then we must consider

the relative weighting that exists between the two players (P_1 = the Pakistani government; P_2 = domestic terrorist groups in Pakistan).

Table 6.2: Weights of Various Dimensions: Government of Pakistan vs. Terrorist Groups

Variable	Government of Pakistan	Terrorist Group
Military External Support	5	2
War Technology System	6	2
Army Size	5	1
Strategic Information and Logistics System	6	3
Natural and Geographical Conditions	7	5
Society Support	5	2
Transportation, Communications and IT System	5	1
Military Know-how	6	3
Industrial Structure	5	1

Note: (Ruiz, Estrada, Park, Kim & Khan, 2015)

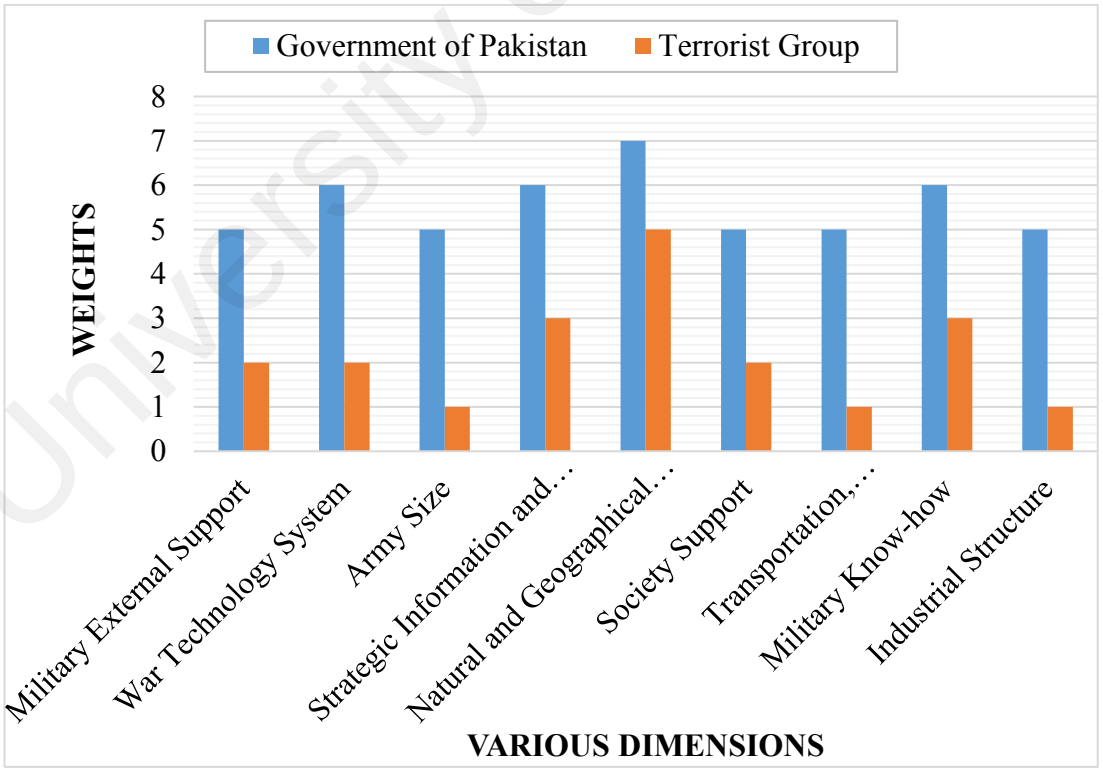

Figure 6.4: Pakistan Govt vs Terrorist Group

Note: (Ruiz, Estrada, Park, Kim & Khan, 2015)

According to the TAVE indicator, the relative weighting for different dimensions is as follows: military external support (5:2); war technological systems (6:2); army size (5:1); strategy, information, and logistics systems (6:3); natural and geographical conditions (7:5); society support (5:2); military know-how (6:3); and (viii) transportation, communications, and IT systems (5:1) and industrial structure (5:1). P_1 (the Pakistani government) clearly enjoys a superior position relative to P_2 (domestic terrorist groups in Pakistan). Therefore, P_1 (the Pakistani government) tends to win the war over P_2 (domestic terrorist groups in Pakistan) if P1 can generate a favorable economic and social condition platform to determine the best development indicator according to the context of Pakistan. Economic leaking (Ω_t) during this terrorist war is 0.65. Wartime economic desgrowth (-δ) is estimated as −0.62. Finally, the war loss (-π) of Pakistan is −0.79. Economic wear (Π) is 0.89 according to the TAVE technique (Ruiz, Estrada, Park, Kim & Khan, 2015). The economic loss of Pakistan should provide a systematic multilateral reconstruction plan, international aid, and institutional and society reorganization to minimize the economic desgrowth (-δ) and war loss (-π) by recovering from the terrorist postwar.

The use of economic desgrowth helps to investigate the potential economic cost generated by terrorism. According to the estimated results of the TAVE indicator, the economic desgrowth caused by terrorism in Pakistan had an influence of −0.15 in 1980s, -0.49 in 1990s and -0.87 in 2001 to 2015. This economic desgrowth value for the 1980s shows that the economic cost of terrorism in this particular decade is negligible. The economic desgrowth caused by terrorism is higher in 2001-2015 at −0.72 than in the 1980s. The difference between these two-time periods explains −0.72 of the estimated results. Results of economic desgrowth confirm that economic cost increases from 1980s to 2015 (see Table 6.1 & Figure 6.2, 6.3, 64). The economy of Pakistan suffered more from terrorism in the post 9/11 period (2001-2015) (Ruiz, Estrada, Park, Kim & Khan, 2015).

The government of Pakistan has allocated a significant portion of the budget to overcome terrorism. Unfortunately, all of these policies have so far been unsuccessful. As a result, terrorism increases day by day. It has caused poor economic performance as mentioned in Mehmood (2014) and Shahbaz (2013). Our results also support those of Gries et al. (2011) and Blomberg et al. (2004a & 2004b). All these studies confirm that terrorism has a negative and significant influence on economic performance. The results of the study are in accordance with rational choice theory, which explains that the terrorists' main objective is to destabilize economic performance (Sandler & Enders, 2008).

Table 6.3: Application of the TAVE Technique to Afghanistan

Variables	1980s (Pre-9/11)	1990s (Pre-9/11)	Post 9/11
Military Tension (ζ)	0.20	0.40	0.93
Economic Leaking (Ω_t)	0.40	0.60	0.95
Average Economic Wear (Π)	0.35	0.45	0.85
Economic Desgrowth (-δ)	-0.50	-0.80	-0.90

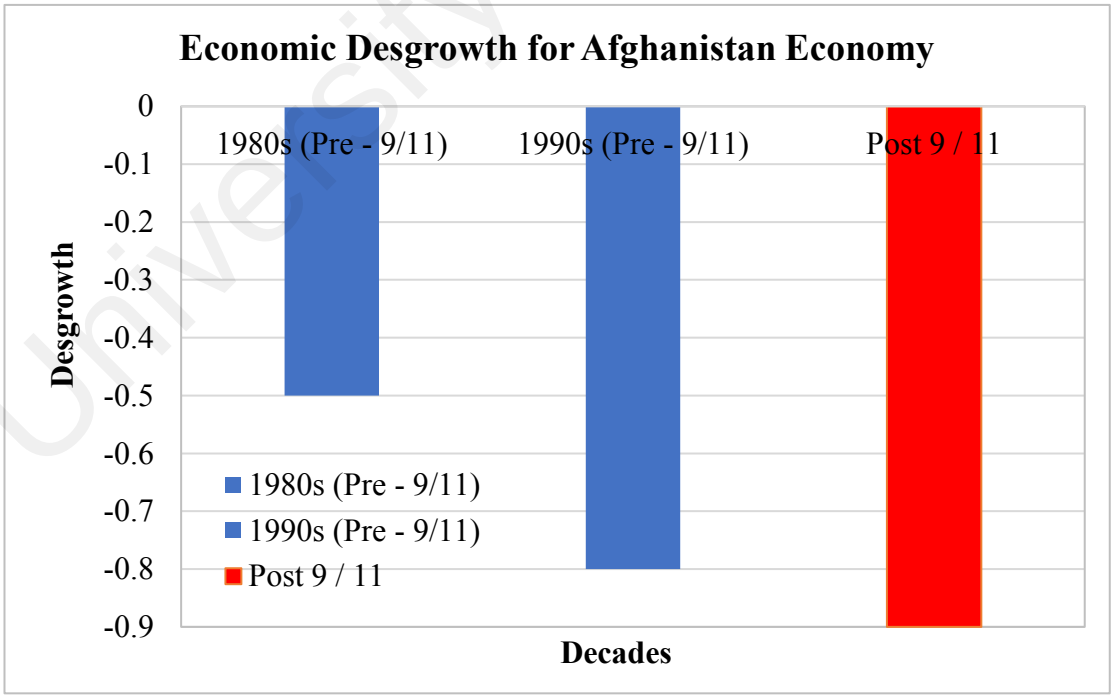

Figure 6.5: Comparison of Economic Desgrowth between Pre-and Post-9/11 of Afghanistan Economy

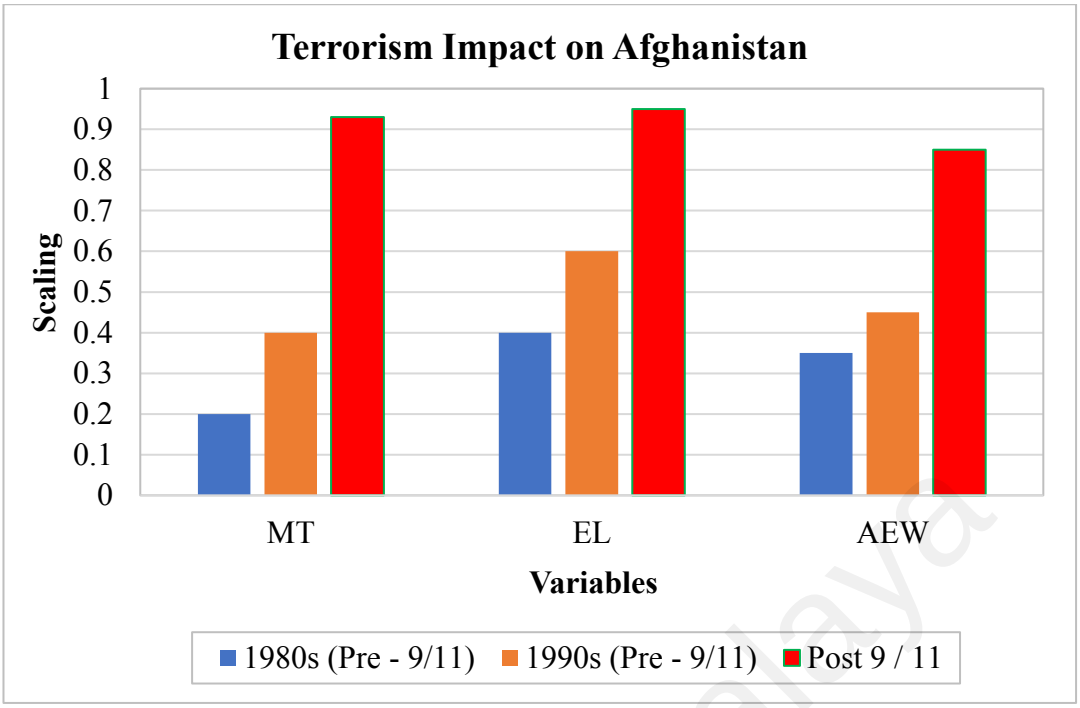

Figure 6.6: Comparison of MT, EL and AEW between Pre-and Post 9/11 of Afghanistan Economy

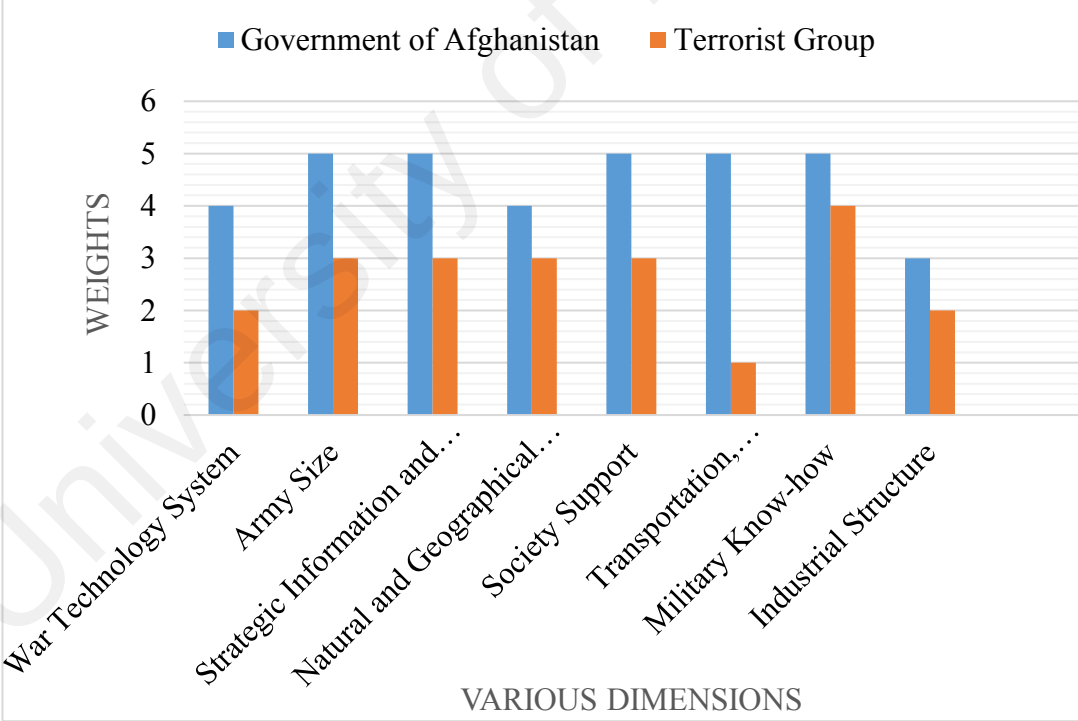

Figure 6.7: Weights of Various Dimensions

The TAVE indicator assumes that P_1 (the Afghani government) obtains help from the United States and NATO countries (P_3). It also assumes that P_2 (domestic terrorist groups in Afghanistan) obtains support from international terrorist groups (P_4). The following

are the three main elements that can precede a war between P_1 (the Afghani government) and P_2 (domestic terrorist groups in Afghanistan): (i) historical issues stemming from a cold war, (ii) rapid expansion of extremist terrorist groups in Pakistan from Afghanistan and terrorist groups from neighboring countries, and (iii) rivalry for political supremacy and hegemony between the Taliban and the current government. These factors jointly generate a high level of terrorism tension between P_1 and P_2. According to the TAVE technique, the level of military tension between P_1 (the Afghani government) and P_2 (domestic terrorist groups in Afghanistan) increased from 0.40 in 1990 to 0.93 in 2015. The average economic leaking (Ω_t) from the terrorist war was 0.40 in the 1980s, 0.60 in the 1990s, and 0.95 in 2015. Economic desgrowth (-δ) averaged −0.50 in the 1980s, −0.87 in the 1990s, and −0.90 in 2015. Average war economic wear (Π) was 0.35 in the 1980s, 0.50 in the 1990s, and 0.85 in 2015. The use of economic desgrowth helps to investigate the potential economic cost generated by terrorism. According to the estimated results of the TAVE technique, the economic desgrowth caused by terrorism in Afghanistan had an influence of −0.50 in the1980s, −0.80 in the 1990s and −0.90 in a decade and half (2001-2015). This economic desgrowth value for the 1980s shows that the economic cost of terrorism in this particular decade was less than the economic desgrowth value of the current a decade and half (2001-2015). The economic desgrowth caused by terrorism was higher in 2001-2015 at −0.40 than in the 1980s. The difference between these two time periods explains −0.40 of the estimated results. Results of economic desgrowth confirm that economic cost increases from the 1980s to 2015 (see Table 6.3 & Figure 6.5, 6.6, & 6.7). The Afghanistan economy suffers more from terrorism in the post 9/11 period (2001-2015).

Table 6.4: Application of the TAVE Technique to Iraq

Variables	1980s(Pre-9/11)	1990s (Pre-9/11)	Post 9/11
Military Tension (ζ)	0.35	0.45	0.80
Economic Leaking (Ω_t)	0.30	0.48	0.85
Average Economic Wear (Π)	0.20	0.53	0.85
Economic Desgrowth (-δ)	-0.30	-0.50	-0.95

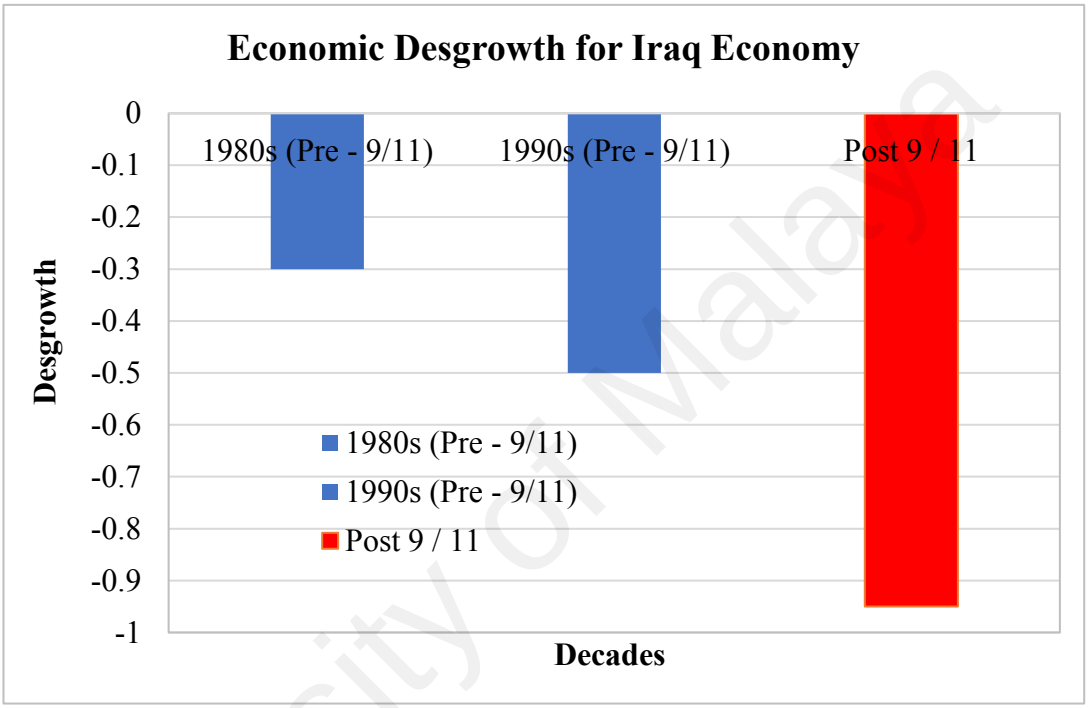

Figure 6.8: Comparison of Economic Desgrowth between Pre-and Post-9/11 of Iraq Economy

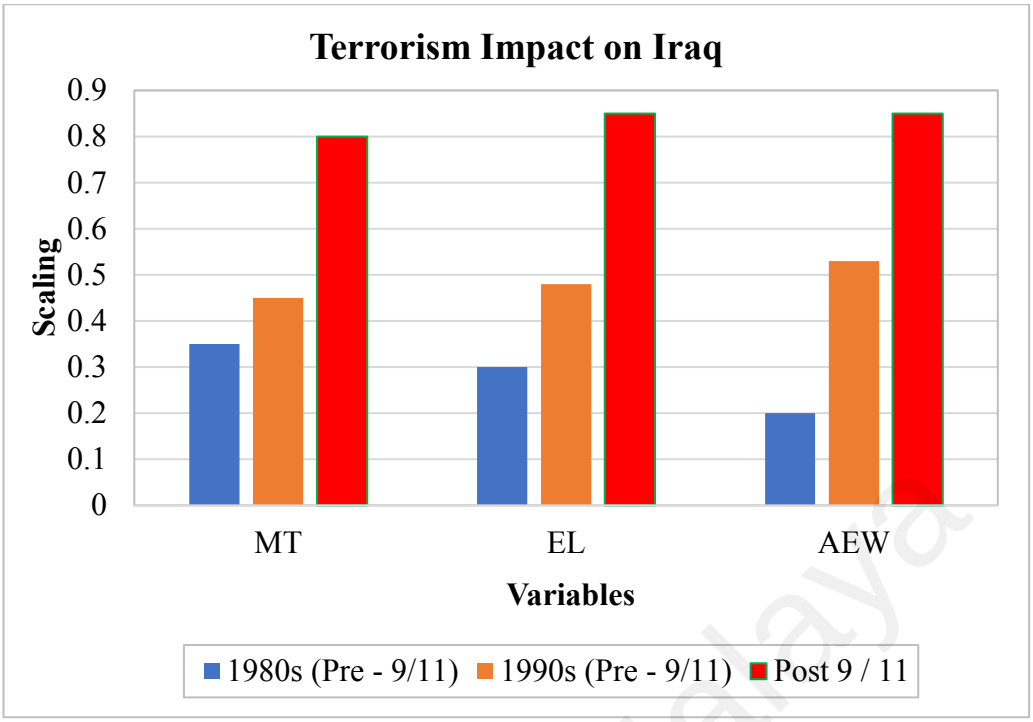

Figure 6.9: Comparison of MT, EL and AEW between Pre-and Post 9/11 of Iraq Economy

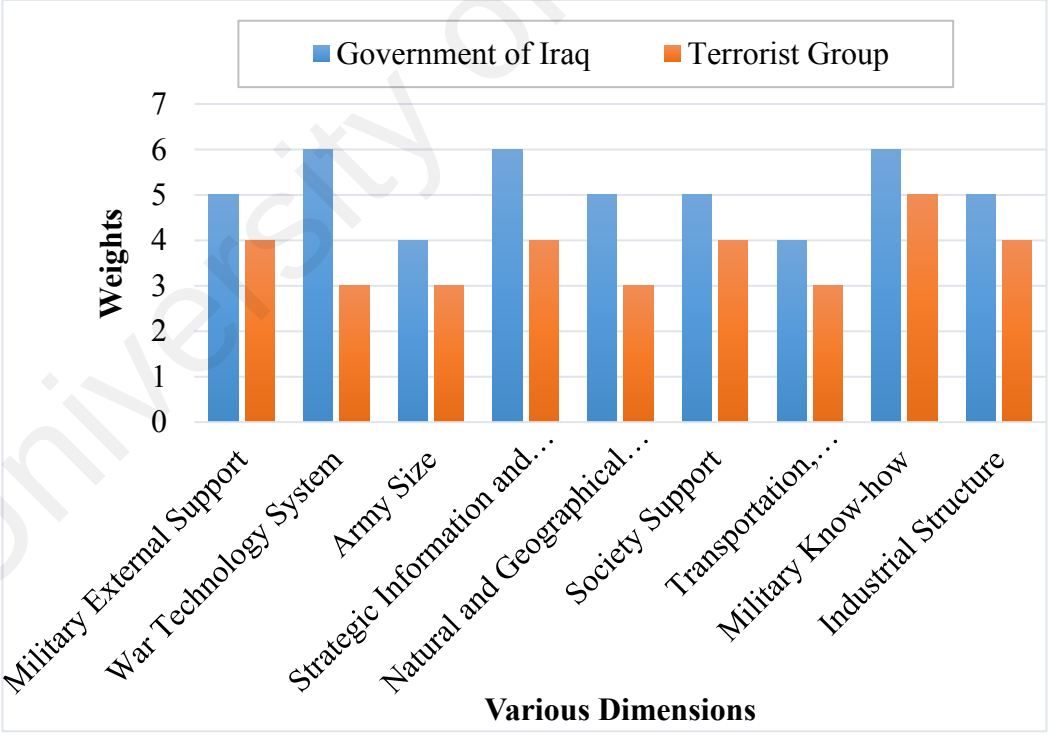

Figure 6.10: Weights of Various Dimensions

The TAVE approach assumes that P_1 (the Iraqi government) obtains help from the United States and NATO countries (P_3). It also assumes that P_2 (domestic terrorist groups

in Iraq) obtains support from international terrorist groups (P_4). The main elements that can precede a war between P_1 (the Iraqi government) and P_2 (domestic terrorist groups in Iraq) are the rivalry for political supremacy and hegemony between the terrorist group ISIS and the current government. In the case of Iraq, the Iraqi government (P_1) is likely to defeat domestic terrorist groups, especially if it can generate more favorable economic and social conditions. The level of military tension between P_1 (the Iraqi government) and P_2 (domestic terrorist groups in Iraq) increased from 0.35 in the 1980s to 0.80 in 2015. The average economic leaking (Ω_t) from the terrorist war was 0.30 in the 1980s, 0.48 in the 1990s, and 0.85 in 2015. Economic desgrowth (-δ) averaged −0.30 in the 1980s, −0.50 in the 1990s, and −0.95 in 2015. The average war economic wear (Π) was 0.20 in the 1980s, 0.53 in the 1990s, and 0.85 in 2015. Therefore, Iraq will suffer sizable overall economic losses in the event of a terrorist conflict, and post-conflict reconstruction is bound to be a costly endeavor in the short and long term.

According to the estimated results of the TAVE technique, the economic desgrowth caused by terrorism in Iraq had an influence of −0.30 in the 1980s, −0.80 in the 1990s and −0.95 in 2001-2015. The economic desgrowth value for the 1980s shows that the economic cost of terrorism in this particular decade was less than the economic desgrowth value of the currently a decade and half (2001-2015). Economic desgrowth caused by terrorism is higher in 2001-2015 at −0.65 than in the 1980s. The difference between these two-time periods explains −0.65 of the estimated results. The results of economic desgrowth confirm that economic cost increases from the 1980s to 2015 (see Table 6.4 and Figure 6.8, 6.9, & 6.10). The Iraq economy suffers more from terrorism in the post 9/11 period (2001-2015).

Table 6.5: Application of the TAVE technique to Syria

Variables	1980s(Pre-9/11)	1990s (Pre-9/11)	Post 9/11
Military Tension (ζ)	0.11	0.08	0.95
Economic Leaking (Ω_t)	0.15	0.10	0.98
Average Economic Wear (Π)	0.25	0.15	0.93
Economic Desgrowth (-δ)	-0.12	-0.10	-0.93

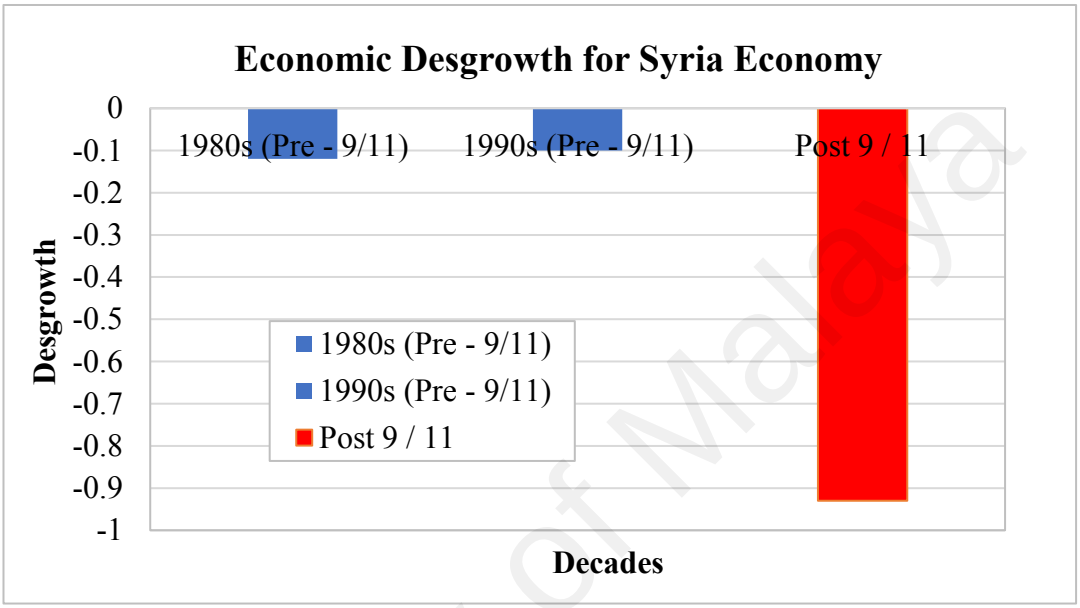

Figure 6.11: Comparison of Economic Desgrowth between Pre and Post 9/11 of Syria Economy

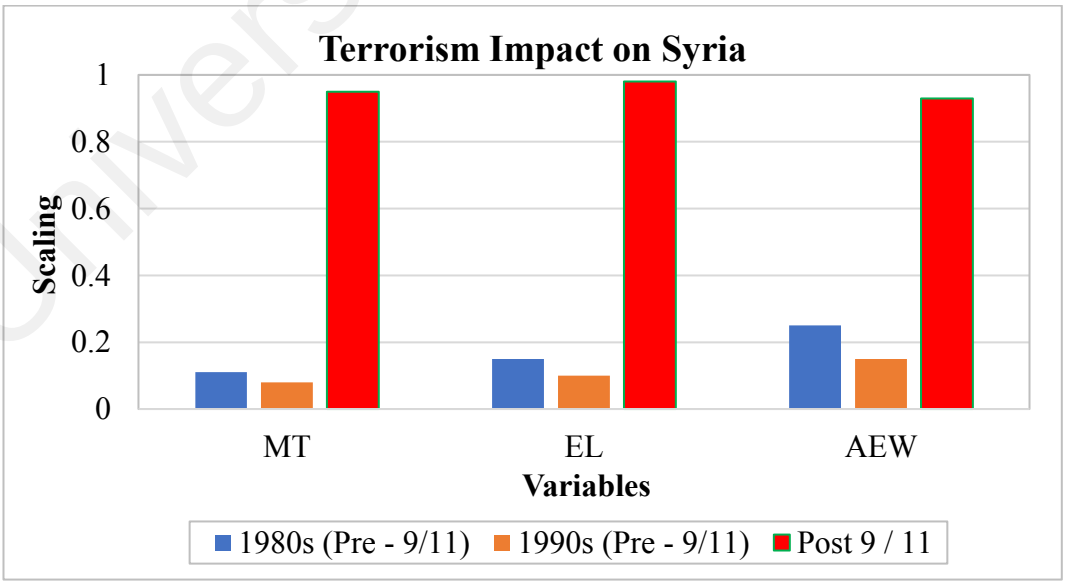

Figure 6.12: Comparison of MT, EL and AEW between Pre and Post 9/11 of Iraq Economy

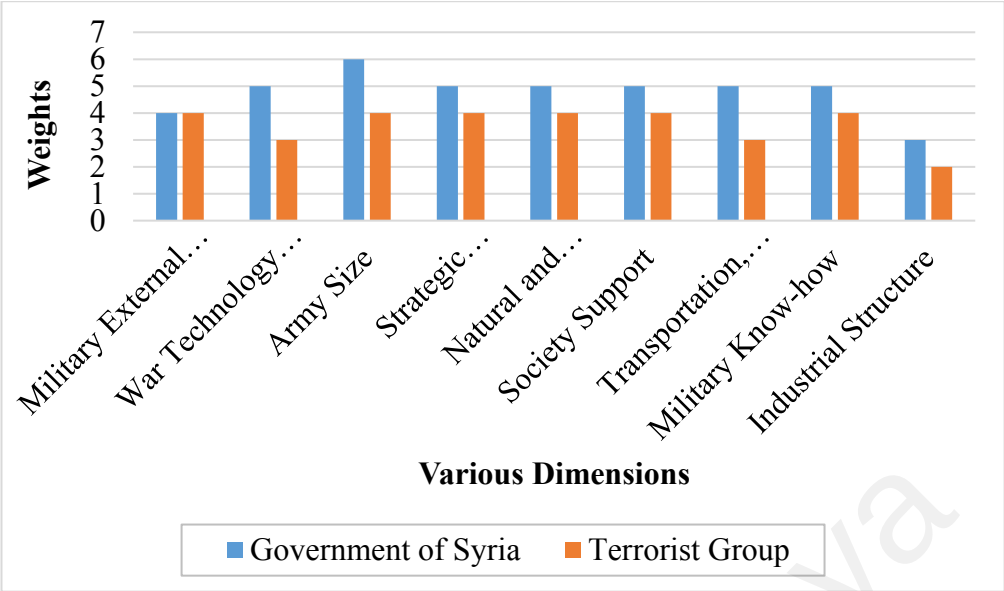

Figure 6.13: Weights of Various Dimensions

The TAVE technique assumes that P_1 (the Syrian government) obtains help from Russia and Iran (P_3). It also assumes that P_2 (domestic terrorist groups in Syria) obtains support from international terrorist groups (P_4). The main elements that can precede a war between P_1 (the Syria government) and P_2 (domestic terrorist groups in Syria) are the rivalry for political supremacy and hegemony between the terrorist group ISIS and the present government. According to the TAVE technique, the level of military tension between P_1 (the Syrian government) and P_2 (domestic terrorist groups in Syria) increased from 0.11 in 1980 to 0.95 in 2015. The average economic leaking (Ω_t) from the terrorist war was 0.15 in the 1980s, 0.10 in the 1990s, and 0.98 in 2015. Economic desgrowth (-δ) averaged −0.12 in the 1980s, −0.10 in the 1990s, and −0.93 in 2015. The average war economic wear (Π) was 0.25 in the 1980s, 0.10 in the 1990s, and 0.93 in 2000-2015.

The use of economic desgrowth helps to investigate the potential economic cost generated by terrorism. According to the estimated results of the TAVE technique, the economic desgrowth caused by terrorism in Syria had an influence of −0.12 in 1980s, −0.40 in 1990s and −0.93 in 2001-2015. The economic desgrowth value for 1980s shows that the economic cost of terrorism in this particular decade was less than the economic

desgrowth value of the currently a decade and half (2001-2015). The economic desgrowth caused by terrorism is higher in 2001-2015 at −0.81 than in the 1980s. The difference between these two-time periods explains −0.81 of the estimated results. The results of economic desgrowth confirm that economic cost increased from the 1980s to 2015 (see Table 6.5 & Figure 6.11, 6.12, & 6.13). The Syrian economy suffers more from terrorism in the post 9/11 period (2001-2015).

The estimated results of economic desgrowth are consistent with a study like the GTI (2015), which reported that, globally, the economic costs of terrorism have increased to their highest levels in 2014 (U.S. $52.9 billion). The SCPR (2015) report further explained that the economic cost of terrorism has increased 61 percent in 2014 as compared to the year 2000. Syria's GDP is estimated to have been reduced further by an average of 15.4% for the period 2011 to 2014. It is expected that the country's economic growth will decline further (by nearly 16%) in 2015. The effect of the decline in GDP growth is in part attributed to a sharp decline in oil production, down from 368,000 barrels per day in 2010 to an estimated 40,000 barrels per day in 2015. Terrorism has affected Syria's foreign trade and the exchange rate very badly. All these statistics support the results of the study and conclude that terrorism has severely affected the economic performance.

The results of the study are in line with the rational choice theory, which explains that terrorists' main objective is to destabilize a country's economic performance (Sandler & Enders, 2008). The results of the study of the economic impact of terrorism estimated in this research are grossly consistent with theory, which clearly demonstrates that economic performance is negatively affected by terrorism.

6.5.1 Comparison of the impact of terrorism on Economic performance pre-9/11 and Post 9/11 of four Islamic Countries

The results of TAVE indicator demonstrate that economic leakages in the form of economic desgrowth (EDG) are generated due to terrorism in the four Islamic countries. The Economic desgrowth values further explain that in Post 9/11, the impact of terrorism on economic performance is much higher than in the pre-9/11 period (1980s, 1990s), not only within the same economy but also among the four mentioned economies (see Table 6.6 & Figure 6.14).

Table 6.6: Economic Desgrowth Comparison of Four Islamic Countries

Country	1980s (Pre - 9/11)	1990s (Pre - 9/11)	Post 9 / 11
Pakistan	-0.15	-0.49	-0.87
Afghanistan	-0.5	-0.8	-0.90
Iraq	-0.3	-0.5	-0.95
Syria	-0.12	-0.1	-0.93

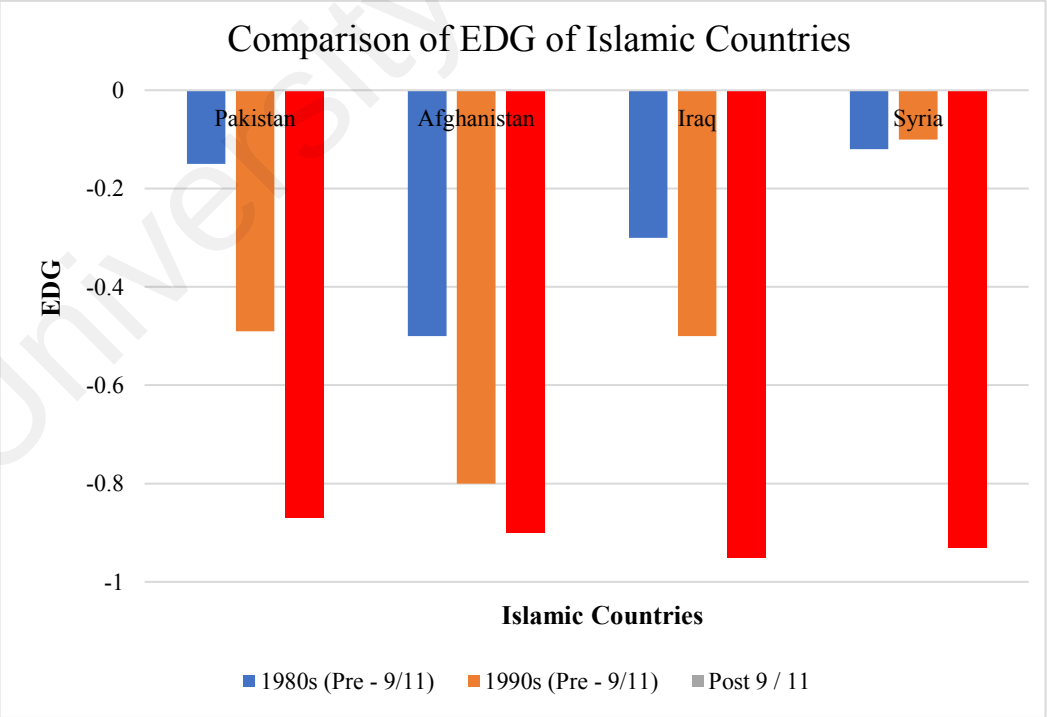

Figure 6.14: Economic Desgrowth Comparison of Four Islamic Countries

6.6 Econometric Analysis: Is Terrorism Linked to Economic Performance?

In testing the relationship between terrorism and economic performance, an econometric analysis is performed to support the hypothesis stating that terrorism can affect economic performance. Panel data techniques have been applied to the data of four Islamic countries: Pakistan, Afghanistan, Iraq, and Syria. The time period of study is from 1980 to 2013. The variables of the study are terrorism intensity, real GDP per capita, population, and exchange rate. The sources of data and variable descriptions are shown in Table 6.6.

The general function of the model will be as follows:

$$Y = f(TR, N, EXCH) \tag{6.8}$$

The panel data can be tested by applying the fixed-effects model or random-effects model (Dewan & Hussain, 2001). The application of the random-effects model depends on the absence of correlation. If correlation exists, then the random-effects results will be inconsistent. The two hypotheses can be test in the said test, which is as follow

H_0: Random effects model is appropriate

H_1: Alternative Hypothesis: Fixed effects model is appropriate

$$y_{i,t} = \alpha_0 + \beta_1 X_{i,t} + \beta_2 Z_{i,t} + \chi_i + \mu_{i,t} \tag{6.9}$$

The assumptions of the random effect model are

$$\left.\begin{array}{l} Cov(\chi_i, X_{i,t}) = 0 \\ Cov(\chi_i, Z_{i,t}) = 0 \end{array}\right) \hat{\beta}_2 \rightarrow \beta_2$$

If the above two assumption are not fulfilled, then the results of random effect will be not consistent. Moreover, in the random-effects model, the individual-specific impact is a random variable that is uncorrelated with the explanatory variables, while in the fixed-effect model the individual-specific effect is a random variable that is allowed to be

correlated with the independent variables. The Hausman (1978) specification test is applied to select the appropriate model. On the basis of this test, the fixed-effects model is applied.

Table 6.7: Variables Definition and Data Description

Variables	Symbols	Description	Data Source
Terrorism Intensity	TR	Terrorism is specified by the total number of incidents, individuals the total number of killed and wounded by acts of terrorism and property damage in a given year of a country	GTD
Real GDP per capita	Y	Economic Performance is measured by the rate of real GDP per capita growth in 2005 constant prices	UN data
Population	N	Number of people in country in a calendar year	UN data
Exchange Rate	EXCH	The price of a nation's currency in terms of US dollar.	UN data

6.6.1 Econometric Results

The econometric results are shown in the two tables below (Table 6.7 and Table 6.8). The pairwise correlation matrix of the variables in the model is shown in Table 6.7. Results of the correlation matrix explain that independent variables have no issue of multicollinearity.

Table 6.8: Correlation Matrix

Variable	Terrorism Intensity	Per Capita GDP (2005)	Exchange Rate	Population
Terrorism Intensity	1			
Per capita GDP (2005)	-0.21 (0.01)	1		
Exchange Rate	0.40 (0.000)	0.23 (0.006)	1	
Population	0.42 (0.000)	-0.18 (0.03)	0.36 (0.000)	1

Note: P-value in parenthesis.

Source: Author's Own Estimations

Table 6.9: Panel regression: Terrorism and Economic Performance

Variable	Coefficient	t-Statistic
Terrorism	-0.004***	-3.05
Population	0.82***	6.18
Exchange Rate	-0.99**	-2.62
Constant	-7.24**	-3.18
F-Statistic	194.32	
No of Observation	136	
No of Groups	4	

Note: ***, **, and * show significance level at 1,5 and 10% respectively

Source: Author's Own Estimations

Table 6.8 illustrates the fixed-effect regression results of the model. The result shows that the coefficient value of terrorism intensity is negative and statistically significant. The result of terrorism intensity explains that there is a negative relationship between terrorism and economic performance in the case of the Islamic countries studied (Pakistan, Afghanistan, Iraq, and Syria). An increase in the number of terrorist activities in these countries will substantially degrade their human capital, and that reduction in human capital will ultimately affect these countries' economic performance. Terrorism can also affect business and consumer confidence, thereby harming investment, consumption, and macroeconomic performance. Terrorist attacks that target vital infrastructure, such as oil pipelines or railroads, can seriously disrupt transportation, communication, and the entire economy. A number of studies detect the negative and significant effect of terrorism on per capita GDP (Abadie and Gardeazabal, 2003; Tavares, 2004; Eckstein and Tsiddon, 2004; Gaibulloev and Sandler, 2008). The coefficient sign is weak, which is justified from the work of Tavares (2004), where the same weak coefficient values have been estimated between terrorism and economic performance. The relationship between terrorism and per capita GDP is in accordance with the rational

choice theory. This negative relationship between terrorism and per capita GDP justifies and supports the TAVE technique.

The coefficient of the population variable is positive and significant. Population gro wth expands the labor force and, therefore, increases economic growth. A large populati on also provides a large domestic market in the economy. The result of the SAVAS (200 8) study suggest that there is strong empirical evidence of a positive causal relationship b etween per capita real GDP and population in all of the Central Asian economies (CAEs), and supports the positive relationship between population and per capita real GDP of t he model. The study by Darrat and Al-Yusif (1999), in the case of developing countries, argued and supported the positive relationship between population and economic growth . The countries in the sample were Argentina, Brazil, Chilie, Ghana, Guatemala, Indones ia, Mexico, Morocco, Pakistan, Peru, Philippines, Syria, Turkey and Uruguay. The resul ts support the revisionist view that higher population growth increases the human capital stock and, as a result, positively contributes to economic development. Results of the po pulation variable oppose the Malthus population theory (1798). In the Malthusian theory , population is a function of per capita income—that is, population is the dependent vari able and income is the independent variable. Actually, Malthus reversed the arguments o f mercantilists who posited that the level of population determined the nation's resources . According to this view, per capita income is a function of population (i.e., population is considered an exogenous variable).

The coefficient value of the exchange rate is negative and significant, which explai ns the negative relationship between real per capita GDP and the exchange rate in the ca se of these four Islamic countries. The study by Belke and Setzer (2003) also supports th is negative relationship between exchange rate and per capita GDP. The F-statistic value is significant at the 1 percent level, indicating that the estimated model fits the data well.

This part of the analysis concludes that terrorism is one of the major factors that aff ects the economic performance of Islamic countries. Policy makers should consider such policies to help not only improve economic performance, but also to help eradicate the t errorism (which is itself a cause and consequence).

6.7 Conclusion and Policy Implications

Terrorist attacks can have extremely negative impacts on economic performance, yet measuring these impacts with any level of certainty is intrinsically challenging. Furthermore, despite the fact that an extensive variety of factors give rise to terrorism, economic factors also play a critical role. This study proposes another approach for assessing the economic impact of a terrorist attack. The TAVE technique (Ruiz Estrada, Park, Kim & Khan, 2015) inspects the evolution of a terrorist attack in three distinct stages: (i) origins of a terrorist attack, (ii) terrorist attack, and (v) post terrorist attack effect. The TAVE technique depends on indicators such as economic desgrowth ($-\delta$), intensity of terrorist attack (α_i), terrorist attack losses ($-\pi$), economic wear (Π) caused by an attack, level of terrorist attack tension (ζ), level of negotiation (η), and total economic leaking (Ω_t) caused by an attack. The hidden instinct is that the economic impact of a terrorist attack is contingent upon a country's vulnerability to attacks from domestic and global terrorist groups, which together measure the leakage from economic growth ($-\delta$) and in this manner, the impact on economic performance and growth.

The results of economic desgrowth of Pakistan's economy elucidate that the impact of terrorism on economic performance is less in the early decade (the 1980s) and slowly increases to its highest value in the later a decade and half (2000-2015). This finding suggests that terrorism has generated more economic desgrowth in Pakistan's economy in the most recent decade. From the perspective of Pakistan's economy, these economic losses are substantial and have offset the economic performance of Pakistan. In a nutshell,

the results of the study conclude that terrorism has generated an economic disaster in Pakistan. It has hampered economic growth by obliterating human and physical capital through economic leaking. Similarly, the terrorism effect on economic performance in the case of Afghanistan concludes that the economic desgrowth in that country increased from –0.50 in the 1980s to –0.90 in 2015. Likewise, in the case of Iraq the economic desgrowth changed from –0.30 in the 1980s to –0.80 in 2015, while in Syria the economic desgrowth jumped from –0.12 in the 1980s to –0.93 in 2015. All the results from the four Islamic countries conclude that terrorism is the primary issue in these economies. This leakage of economic growth therefore causes poor economic performance. The econometric analysis is applied to support the economic desgrowth results. The econometric analysis of the study also confirms that terrorism and economic performance have a negative and significant relationship in the case of Islamic countries (Pakistan, Afghanistan, Iraq, and Syria). The results of the econometric analysis support the economic desgrowth results.

Although a number of solutions have been presented to solve the issue of terrorism in Islamic economies, in this case, it finds that highly organized military and civilian coalition intelligence (logistically and financially) together with effective poverty eradication programs are the basic and effective anti-terrorist policies for Islamic countries. The results of these two policies, which are recommended for Islamic economies by this research work under the final empirical results of the TAVE technique (Ruiz Estrada et al., 2015) in the cases of pre- and post-attack activities, can generate a spillover effect to reduce (partially or totally) any possible terrorist event in these Islamic countries. Similarly, this research claims that the generation of economic growth, together with sustainable social programs in all these Islamic economies, not only improves social compliance but also subdues the extent of possible terrorism events at all levels. In addition, the future of the Pakistani, Afghan, Iraqi, and Syrian economies is based on the

availability and the quality of justice, which can also play an effective role in reducing terrorism in these countries in the short and long runs (because social injustice can lead to terrorism).

CHAPTER 7: CONCLUSIONS AND POLICY RECOMMENDATIONS

7.1 Conclusions

This dissertation thesis develops four subnational terrorism indicators and examines the economic causes and consequences in four Islamic countries: Pakistan, Afghanistan, Iraq and Syria. The organizing hypothesis of the dissertation thesis is that terrorism can have economic consequences and causes, and given the terrorism indicators, this hypothesis is explored in a series of 4 empirical economic essays, starting in chapter 3. Methodologically and econometrically, this thesis deploys several panel data estimators to identify the linkages between poverty and terrorism, the effects of terrorism on trade and economic performance as measured by real per capita Gross Domestic Product.

The main hypothesis of the terrorist economic impact evaluation (TEIE) technique (Khan & Yusof, 2016) is to test whether or not the intensity of terrorism in measuring economic cost varies across geographical locations of the same country and covers the first objective of study. The TEIE technique shows that terrorism intensity varies across the different provinces/states of the country at the same time. This technique proves that terrorism measurement is important not only at the country level but also at the province level in taking more accurate measures to curb terrorism.

The results of terrorist economic impact evaluation (TEIE) technique reveal that all provinces/states are affected by the different magnitude of terrorism intensity in the case of Islamic countries Pakistan, Afghanistan, Iraq and Syria). In the case of Pakistan, overall in 2002–2014, Balochistan and KPK are the most affected provinces/states, followed by Sindh and Punjab. These results also confirm that the terrorist activities used to measure economic cost are not uniform among all the provinces (states) of the same country. In Pakistan, some states (provinces) are more affected than others at the same time. The average economic costs of terrorism in KPK, Balochistan, Sindh, and Punjab are 0.382,

0.242, 0.151 and 0.084, respectively. Similarly, in the case of Afghanistan, there are 34 provinces, which are divided into eight regions. Results of TEIE indicator show that the terrorism intensity is higher in south western region than the rest of the country. Southwest region includes the Helmand, Kandahar provinces, which are one of the most terror provinces in Afghanistan. Likewise, in the case of Iraq, the TEIE indicator concludes that Baghdad is the most terrorism intensity province of the country, followed by Saladin and Al Anbar. In the same way, the TEIE indicator results for Syria explain that the most terrorism activities have been observed in the province of Damascus, followed by Aleppo.

The second objective is to test and measure the root cause of terrorism through an examination of the poverty–terrorism nexus. The main idea of this research objective is to develop the PTEM technique, which evaluates the response of change in poverty growth rate to terrorism vulnerability growth rate. The PTEM technique has three main phases: Terrorism evaluation measurement, poverty growth rate, and the PTEM. Terrorism vulnerability is measured through terrorist attack incident growth rate, terrorist attack fatality growth rate, terrorist attack injury growth rate, and terrorist attack capital loss growth rate. The PTEM technique provides three levels of terrorism vulnerability: level 1, low terrorism vulnerability; level 2, moderate terrorism vulnerability; and level 3, high terrorism vulnerability. Level 1 range from 0 to 33, level 2 of 33.01 to 66, and level 3 of 66.01 to 100. These terrorism vulnerability levels indicate the severity of the magnitude of terrorism intensity of an economy in a particular time period. The poverty growth rate (head count ratio) explains the percentage of the population living below the poverty line. In the third part of the PTEM technique, the relationship between poverty and terrorism vulnerability is measured through the PTEM. The PTEM technique examines the response of terrorism vulnerability to poverty growth rate, and the response has three main possible results. High response is observed when more changes are

observed in terrorism vulnerability than in poverty growth rate. Low response is observed when few changes are seen in terrorism vulnerability compared with the changes in poverty growth rate. Zero response is the case in which no change is observed in terrorism vulnerability as poverty growth rate changes.

The second part of the third objective is to apply the PTEM technique to the provinces of Pakistan. The relationship between poverty and terrorism in the provinces of Pakistan is examined. Pakistan has four provinces/states: KPK, Balochistan, Sindh, and Punjab. The time span of the application of the PTEM indicator of the provinces of Pakistan is from 2002 to 2014 (post 9/11). Results of the PTEM technique applied to KPK indicate that the average value of PTEM is 67.62, which shows that a 100% change in poverty brings about 67.62 change in terrorism vulnerability in KPK in 2002–2014. The average growth rate of poverty, terrorism evaluation measurement (Π) for Balochistan in 2002–2014 is 27.62. The overall average response of terrorism vulnerability to poverty growth rate is positive in the case of Balochistan but is less sensitive than the case of KPK in 2002–2014. The average growth rate of PTEM (Π) for Sindh is 13.12, which is less sensitive than that of Balochistan and of KPK at the same time period. The average growth rate of PTEM (Π) for Punjab in 2002–2014 is 30.98. On average, the response of terrorism vulnerability to poverty growth rate is less elastic and less sensitive in the case of Punjab in 2002–2014. The results of the PTEM technique show a link between poverty and terrorism vulnerability among the provinces of Pakistan, but the link fluctuates over time and across geographical locations. These results of the PTEM technique are supported by the econometric analysis. The econometric results also confirm the findings of the PTEM technique, thus showing that poverty generates terrorism in the case of the provinces of Pakistan. Thus, the results of the second objective indicate that poverty is one of the root cause of terrorism in the case of the Pakistan economy.

The third objective involves developing an index to measure the trade–terrorism relationship and to apply the index to Islamic countries (Pakistan, Afghanistan, Iraq and Syria). The trade–terrorist index is developed to test the trade–terrorism relationship. The TTEI (Khan & Yusof, 2016) and TOTEI examine the effect of terrorism on international trade. The application of TTEI to Islamic countries, shows the responsiveness of trade to terrorist attacks and evaluates the trade–terrorist attack relationship in a particular year, whether the relationship is more sensitive or less sensitive. The econometric analysis on the Islamic countries indicates that terrorism has negative and significant effects on the international trade of the Islamic economies and supports the hypothesis of TTEI and TOTIE that terrorism negatively affects international trade.

The results of the last objective suggest that terrorist attacks have significant and negative effects on economic performance, but quantifying this effect with accuracy is difficult. In addition, many factors may cause terrorism, and economic factors play a major role. In the last objective, it is suggested and evaluated a new technique for measuring the economic effect of a terrorist attack. Three different phases are considered in the evaluation of the terrorist attack vulnerability evaluation (TAVE) model (Ruiz Estrada, et, al., 2015): origins of a terrorist attack, terrorist attack, and post-terrorist attack effect. The TAVE technique depends on various indicators such as economic desgrowth, intensity of terrorist attack, terrorist attack losses, economic wear caused by an attack, level of terrorist attack tension, level of negotiation, and total economic leaking caused by an attack. According to the TAVE technique, if the real GDP growth rate is low, then the economic leaking caused by a terrorist attack definitely affects economic performance. Concurrently, the economy faces continuous economic desgrowth. However, if the economic performance of the economy is high, then the total economic leaking generated by a terrorist attack has a weak effect. Total economic leaking causes economic desgrowth but in a limited amount. The application of TAVE technique to the

economies of Pakistan, Afghanistan, Iraq and Syria reveal that terrorism has affected all these Islamic economies very brutally.

The main findings of the dissertation conclude that for the four Islamic countries, poverty is a driver of terrorism, and it adversely affects economic performance and trade.

7.2 Policy Recommendations

This study provides evidence that terrorism is the central dilemma of the majority of developing countries including Pakistan and some other economies like Afghanistan, Iraq and Syria. The study of McKenna (2005) reveals that financial markets, multinational firms, and governments are integrated because of globalization. Therefore, any terrorism event that can generate economic uncertainty has increased the negative economic consequences. As nations move toward more democratic, liberal economies with a political structure, strong and powerful institutions must curb terrorism. The economic consequences of terrorism are potentially very high as confirmed by one of our research objectives. Therefore, devising policies addressing the factors that contribute to terrorism (causes of terrorism) and investigating ways to suppress the related terrorism risk are needed. Policymakers may need a more comprehensive knowledge about the toxic causes and effects of terrorism, and they must keep in mind the specific demographic conditions and institutional characteristics of terrorist-affected economies. Policy recommendations proposed to reducing the risk and economic consequences of terrorism. The policies are recommended by considering the following three aspects e.g. security-effective measures, growth-friendly measures, and economies of Pakistan, Afghanistan, Iraq and Syria.

7.2.1 Security Measures

The problem with the existing counter-terrorism policy is that all terrorism-related policies are circulated and mostly depend on military measures to combat terrorism and the negligence of the role of civil agencies. Similarly, it is suggested that better military

and civilian intelligence will also help. Effective poverty eradication programs that render poor's to be less susceptible to the ideological propaganda of extremist groups can also help. All stockholders of the policies of terrorist-affected economies should be involved. First, the nature of terrorism is specified in keeping with the structural hierarchies of the law enforcement agencies in all these terrorisms affected economies.

As one of the objectives of this study, measuring the economic cost of terrorism is important because it helps to efficiently allocate the budget for defense expenditure. We advocate this recommendation instead of relying on pure military measures and policies so that more funds will be allocated to defense and military expenditure. Policymakers should take concrete steps to strengthen the civil intelligence agencies. These types of policies should involve advanced weapons, training of personnel, advanced equipment for the detection of explosive materials, and cooperation among law enforcement agencies, civil intelligence, and military. These defense policies need additional expenditure on defense, which will be possible only when international institutions and developed economies financially help terrorism-affected economies such as Pakistan Afghanistan, Iraq and Syria to strengthen the coordination among anti-terrorist agencies locally and internationally.

7.2.2 Growth-friendly Measures

The benefits of economic performance must be allocated to all segments of the population of the economy. The government should concentrate on the institutions responsible for the development, such as working for employment opportunities, improving educational facilities and health facilities, and creating an environment where the government and people become closer and trust in each other's goodwill. The government should remove the deprivation of the public by providing greater educational opportunities in terms of improved merit-based educational systems. Sectarian terrorism

issues also exist in all these economies, such as the Shia-Sunni problem in the economies of Pakistan, Iraq, and Syria.

International institutions such as the UN, World Bank, IMF, WTO, European Union, and Asian Development Bank should also play their role in eradicating terrorism in developing economies. These institutions can work with these developing economies to deal with economic deprivation and poverty, which are two of the major causes of terrorism in developing countries. Deprived people from different parts of the world mainly join the terrorist group ISIS because they want to take revenge and fight against inequality. Therefore, if international organizations want to defeat these terrorists, then they should find ways to diminish the feelings of deprivation of the people. Feelings of deprivation can be reduced to eradicate poverty, reduce the global income inequality, and ensure that the fruits of globalization are equally distributed among all nations.

Moreover, policies must be designed to encourage the spread of democracy and to provide poor economies a stronger voice in all these global institutions. These policies should help to empower those who presently feel marginalized. Our common objective must be to eliminate poverty, to promote social justice, and to bring the marginalized people of the society into the mainstream of the global economy and society. The use of military force may be suitable in certain cases, but it is also problematic because its use can create new resentments, grievances, and even the next generation of terrorists.

Policies can provide political empowerment in the world. For example, Iraq was ruled by the Saddam government for more than three decades. During Saddam's rule, the grievances between Sunni and Shia become increasingly wide. Then, after the attack of the United States on Iraq in 2003, the Saddam government was overthrown, but the issue of sectarian problem was still not solved. As a result, the whole country was involved in the terrorism issue. Some groups joined Shia militia to force the majority of the Kurdish

people, and the Sunni has supported the insurgent group ISIS, which sympathizes the Sunni people. The political problem in Syria is the Basharul Asad government, which receives support from Iran and Russia. By contrast, the United States supports the people fighting against the Asad regime. In January 2014, the international community comprising the United States, Russia, and the UN organized a conference in Switzerland to implement the 2012 Geneva Communique, an internationally backed agreement that calls for the establishment of such a type of government in Syria consisting of all the major groups of the Syrian people. Unfortunately, this effort failed, and the UN special envoy Lakhdar Brahimi blamed the Syrian government's refusal to discuss opposition demands and its insistence on fighting "terrorists" - a term Damascus uses to describe rebel groups. What we need is for the global community to play its role of combining all segments of the population of Syria and to establish a type of government that is acceptable to all.

7.2.3 Policy Recommendations for the Pakistan Economy

The following is the policy recommendations based on our study to the federal government of Pakistan and the provincial government to curb terrorism and poverty in their respective jurisdictions.

- Improving, expanding, and having more effective local and provincial police forces to implement the top counter-terrorism priority can be achieved through proper training and advance technology in crime scene and terrorism investigation.
- A separate new parallel counter-terrorism force can be created, and its personnel and functions can be included in regular police squads after they receive the necessary training.
- Modifications should be made in the evidence act to change the focus from witness proof to modern scientific evidence. The government must invest in strong state-

protection programs for eyewitnesses, investigators, prosecutors, and jury members in terrorism and other major criminal cases.

- The enhancement of police operational autonomy and accountability can be achieved by confirming that the provincial police inspector general is free from political influence, appointed on merit, and granted full authority over the force.
- A comprehensive curriculum can be devised to train the law enforcement personnel and police department to curb hate speeches and terrorism-related literature and to take action against people circulating those speeches and literature.
- Pakistan's list of banned terrorist groups should be updated under the Anti-Terrorism Act (ATA) 1997 along with the UN Security Council (UNSC) Resolution 1267 committee blacklists. The updated lists must be available to the federal and provincial security agencies, including the police, other law enforcement agencies, financial institutions, and the public. Circulating a regularly updated list of officers and members of banned terrorist groups among all provincial governments is also important. Doing so will reduce the travel times of terrorists, bearing arms, financial transactions, and other inadmissible actions.
- A specialized cell within the Federal Investigation Agency is required to scrutinize terror financing and money laundering issues. Contemporary and complete authority over such cases should be established between the law enforcement agencies and specialized local terrorist squad of police units and the counter-terrorism departments.
- Financial institutions and banks require the use of modern computer software to evaluate the accounts of banned terrorist groups and their fund transfers. This measure will help to reduce the funds that finance terrorism.

- Improvements should be made in the state's ability to curb terror financing within the province and from the Federally Administered Tribal Areas by extending the control of KPK police and other law enforcement agencies to the tribal areas.
- The problem with Pakistan's poverty alleviation policies is that most of the policies are uniform among all the provinces and at the federal government level, in which the entire country and/or entire population is equally treated. An one-size-fits-all policy is not productive. As a result, the coverage and implementation of these policies remain inadequate. The government of Pakistan should decentralize the poverty alleviation policies according to the geographical location and needs of the population to help curb terrorism in the country.
- The demographic transition shows that the working-age population in Pakistan has increased. In reaping the demographic dividend, the knowledge base and skill levels of the youth should be enhanced, and the youth should be provided with productive employment opportunities to bring economic and social prosperity to the country.
- Disparities among small provinces should be eliminated by giving them more autonomy from the federal government. For example, Balochistan and KPK are the largest contributors of natural gas and electricity, but they receive less than their fair share.
- Peaceful dialogue should transpire among the unhappy heads of tribes, especially in Balochistan and the tribal areas, and these heads should be brought to the dialogue table.
- Funds distribution of the Benazir income support program for the poor should be free from political influence.
- The use of force in a few cases is good in the case of Pakistan, such as in the tribal areas. However, it may produce future terrorists in some cases such as in Balochistan.

7.2.4 Policy Recommendations for the Afghanistan Economy

Afghanistan continues to be one of the main victims of terrorism. Afghanistan economy in the current scenario is the world worst economic in terms of economic conditions. Afghanistan has become a rentier state. Most of the state institutions are collapsed due fear and law and order situation. The main causes of security threats are Taliban, Al-Qaeda, Pakistan Taliban, Lashkari Tayyaba, criminals, narcotics, tribal actors, militia groups, and corrupt government officials. These security threats explain that the issue of Afghanistan is not a monolithic thereat. The dimensions of threat are multidimensional. To combat against terrorism, it will need to restructure the arm forces, use of advance weapons, and proper policy training. Along with the security measures, it is also required to implement justice at the grass root level (district level), otherwise the efforts of security measures will be useless. Because in the case of injustice and corrupt society, the trained forces will not provide and achieve the task of curbing terrorism. The government of Afghanistan may also need to do efforts for the socioeconomic development as the general masses of population are poor and need the government support. Afghanistan may also focus on peace dialogue with the Taliban, as one of the main actor of insurgent groups. This will overcome terrorism incidents in Afghanistan in general and in those areas, in particular which is under control of Taliban. Afghanistan requires also to do more joint work with Pakistan on border security. This will reduce the flow of terrorists across the border.

7.2.5 Policy Recommendations for the Iraq and Syria Economy

ISIS terrorist group involves in more than 70% of terrorist activities in the economies of Iraq and Syria. Foreign fighters in ISIS are belonging to more than 110 countries and their number has accessed more than forty thousand. The ISIS terrorist group is no more domestic terrorist group, it has become a global terrorist group, it has now involved in the terrorist attacks in Europe and Asia such as the rest of terrorist attacks in France and

Bangladesh. The strength and the number of foreign fighters in ISIS explain that the issue of terrorism to ISIS is not only a threat to the economies of Iraq and Syria, but also a big challenge for the rest of the world. The world community should do work on mainly three perspectives:

(1) Combat foreign fighters flow: To reduce the flow of foreign fighters to join ISIS in Iraq and Syria, the international community should communicate through Interpol and cancel the visas of young people to these economies especially the European citizens.

(2) Propaganda network: A terrorist group such as ISIS uses social media such as twitter and Facebook for the quick and easiest way to spread the literature to the like-minded people in the other part of the world. The world community may block such type of twitter and Facebook accounts to isolate idea of terrorist from the general public.

(3) Finance flow: The flow of funding to ISIS from rest of the world can be stopped through freezing the bank accounts of suspects of terrorist people.

Along with the above three main policy perspectives, the Syrian economy will have to deal with abrupt economic challenges. It will also require to help the return of internally displaced people and refugees in neighbouring countries. Along with that, the government of Syria will also need to rebuild the country's infrastructure, improve the provision of public services including health and education, and rebuild the social fabric of the country.

7.3 Limitations and Future Research Studies

This work is based on secondary data taken from Global Terrorism Database (GTD) and applied to four Islamic countries. The below mentioned studies may be carried out in the future and have not been covered in this research work. The Future studies are;

a) Re-examination of these issues using primary data to determine the motives of terrorists.

b) PTEM indicator can be used for other *less developing economies*.

c) Alternative indicators can be developed for Economic Effect of Terrorism by considering such variables:

d) Sources of financing of terrorism,

e) Economic conditions of the Suicide Terrorists,

f) Muslim versus non-Muslim countries,

g) Illegal Drugs and Terrorism,

h) Comparison of different global and local terrorist groups,

i) Terrorism, Religion, law and Economic Development,

j) Exchange Rate volatility and Terrorism.

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