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TERRORISM, GLOBALIZATION AND ECONOMIC GROWTH: EVIDENCE FROM ASIAN AND AFRICAN DEVELOPING COUNTRIES

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Abstract

This paper traces the impact of globalization on economic growth of Asian and African countries with a particular focus on the moderating role of terrorism for the time period 1984-2013, applying System Generalized Method of Moments. Finding from the multidimensional aspect of globalization suggest overall positive effect of globalization on economic growth but its marginal effect tends to revert in the presence of terrorism. Specifically, the insurgence of terrorism at high percentiles depresses the growth effect of globalization profoundly. Moreover, the cross-country comparison classifies Sri Lanka and Mozambique as the outlier countries striving beyond the threshold level of terrorism where the positive effect of globalization is entirely offset. The findings recommend controlling anti-globalization impact of economic growth through tackling the issue of terrorism.

JEL Classification: F4, H56

Key Words: Globalization, Terrorism, Economic Growth, Developing Countries, System GMM

1. INTRODUCTION

Globalization has remained vital for the world economies with all its pros and cons. With the passage of time, countries have become more interlinked through a number of economic and non-economic channels of globalization [Ritzer and Malone (2001)]. However, the focus has long been lingering on its economic aspect due to its direct implications for the world economy. In the nexus of product, factor and financial markets globalization has been mainly governed by the mobilization of exports through tariff cuts, capital and technology diffusion, international division of labor and financial transactions. Theoretically, the process of globalization led its path to the economic growth through Gross Domestic Product (GDP) growth, investment and employment [Stiglitz (2003)]. However, the changing perspectives in globalization have developed the interest in its social and political aspects as well. The modern wave of globalization observed the internalization of political economies, development of the multifaceted system of global governance and the establishment of new regional and global laws. This renders the globalization a dynamic process which is systematized on the global base and its branches are extended to economic, social and political sphere [Grebosz and Hak (2015)].

The economic growth and globalization relationship have gained much attention in growth literature. Through its trade channel, the ratio of trade to GDP has increased

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over the time and boost in aggregate demand in one country has stimulated the demand in the others. Sachs and Warner (1995) identified that the open economies grow by about 2.5 percent more rapidly than the closed economies. According to Mishkin (2009), globalization boosts economic growth in developing countries by providing the transmission and adoption of advanced technology from the developed world. Similarly, foreign investment in the wake of globalization tends to increase the employment opportunities, diffuses technology, knowledge, information and ideas and enhances the efficiency of labor and capital in respective country, which in turn increases the economic growth [Romer (1993); Borensztein et. al., (1998)].

Realizing the potential benefits from globalization, many developing countries integrated their economies, particularly through the channel of trade and financial flows since early 1980s. Several developing countries from East Asia and Latin America gained economically from globalizing their economies and emerged as major globalization partners. However, globalization spur has been confronted with a number of constraints and interventions. The non-tradable sector, institutional differences, political preferences, legal systems, internalizing environmental costs and above all the global terrorism has emerged as challenges to the world-wide globalization and its spillover effects. Terrorism leads to anti-globalization measures in the form of strict regulations for factor mobility and the countries affected by terrorism faces downturn in their trade and investment.

Since 1970s Asian region has been facing the terrorism threats. With the rise of the fundamentalist terrorist organization in 1980s, there are many dreadful terrorist incidents in Middle East and South Asian countries. In these regions, the attacks have not only the direct impact on different sectors of their economy but it has also built a threatening atmosphere for globalization in terms of limiting international trade, diverting foreign direct investment, shrinking tourism industry and weakening of international political relations. In Bangladesh terrorism has created worse law and order situation which has halted the foreign investment, resulting in underdevelopment of resource enriched country. In Nepal, tourism industry used to contribute 15 percent of total foreign exchange earnings and 5 percent of total GDP to the economy, but persistence of terrorism has affected tourism industry negatively, hence decreasing the social globalization and reducing the economic growth of Nepal. In South Asia, Sri Lanka was the first country to liberalize its economy in 1977, but it couldn't enjoy the benefits of integration because of continued terrorism [Khatri and Kueck (2003)].

Similarly, the post 1990's African countries are severely affected by terrorism. The economic cost of terrorist attacks goes further than the loss of human and physical capital. These violent attacks in African region has increased the cost of business, inflated uncertainty in financial market and diverted the external as well as internal investment. The tourism industry, international trade and short-term capital flows were also adversely affected by terrorism. According to IMF report, terrorism in Nigeria has reduced the foreign direct investment by 30 percent in 2010. Dreadful attack on tourist in Egypt, car bomb attack on hotel in Kenya, Somalia Black Hawk incident, bombing of US embassies in Kenya and Tanzania has resulted in major

economic consequences. These attacks have caused significant downturn in investment and in airline and tourism industry. Africa is an important source of natural resources including oil. Recent discovery of rich offshore oil reserve could lead to improve the status of African oil supplier, but the terrorist attacks disrupted the crucial supply lines to the industrial world, thus deterring its growth and development [Gaibulloev and Sandler (2010)].

In short, both the globalization and terrorism have become the buzzwords of the present time. In developing countries globalization can be powerful engine of economic growth. However, the current rise in terrorism is expected to adversely affect the economic growth. So, this study investigates a link between terrorism, globalization and economic growth in selected Asian and African developing countries.

1.1 Objectives of the Study

Keeping in view the expected connotation between terrorism, globalization and economic growth, this study is an attempt to empirically investigate the impact of globalization in interaction with terrorism for a panel of selected Asian and African developing countries over the time period 1984-2013, besides its direct effect. The sample of Asian and African countries is selected on the basis of their degree of terrorism; the countries where terrorism has remained persistent and alarming over the time. In other words, countries which are prone to terrorism due to frequent terrorist activities and high number of casualties are taken into account. These countries are economically smaller and have problems like dense population, scarcity of resources, poverty and income inequality that make their position more vulnerable towards the terrorism shocks.

1.2 Organization of the Study

The rest of the paper proceeds as follows: Section 2 provides the review of literature; Section 3 provides an overview of Asian and African countries experience of globalization and terrorism. Section 4 presents methodology and section 5 reports and discusses the empirical findings. Section 6 concludes the study with some policy implications.

2. LITERATURE REVIEW

World is undergoing through phenomenon of globalization because of rapid increase of technology, communication and transport links along with financial and factors mobility among countries. Currently economic growth and globalization relation has gained attention becoming the widely debated topic in growth literature. Sachs and Warner (1995) identified that open economies grow about 2.5 percent more rapidly than the closed economies. This difference is more acute among developing countries. Many developing countries integrated their economies globally, particularly in terms of trade and financial flows since early 1980s.

Barro, Mankiw and Sala-i-Martin (1995) investigated the economic growth theory for an open economy and found positive impact of internationalization on economic growth. According to their study, domestic savings turn into investment in closed economy, but in open economy besides domestic saving foreign saving is also available, which leads to increase the investment rate and helps in physical capital accumulation ultimately affecting the growth rate positively. Similarly, Grossman and Helpman (1990) provided direct and long run connection between globalization and economic growth through the channels of international diffusion of technology, goods and knowledge spillover. Accordingly, growth is not only attained through transfer of technology from developed to developing country, but also by imitation of products and technology. International knowledge, ideas and technology spillover from advanced economies lead to new information about production, which results in increasing efficiency of the economy, and hence economic growth. In addition, integration of world financial markets results in high productivity and employment, efficient allocation of resources and investment growth and thus raises the economic growth.

To precisely evaluate the effects of globalization on economic growth empirical analyses is needed. In literature, most of the authors used a specific measure for globalization such as trade liberalization and capital flows.[2]Asesina, Grilli and Milesi (1994), Klein and Olivei (1999), Chanda (2001) used capital openness as proxy for globalization whereas Dollar (1992), Greenaway et. al., (1999), used trade openness to investigate the impact of globalization on growth. Furthermore, Borensztein et. al., (1998) and Carkovic and Ross (2002) used foreign direct investment to measure globalization. Though these studies investigated the economic dimension of globalization extensively but didn't take into account the other dimensions of globalization. Dreher (2006) made an attempt to develop a comprehensive index of globalization which captures its multidimensional aspects for large number of countries.[3] The study further analyses the economic growth impact of KOF index of globalization for a panel of 122 developed and developing countries over the time period 1970-2004. The study shows that globalization is good for growth. The result shows that economic and social globalization have positive impact on growth whereas political globalization has insignificant impact. On average the countries which are more integrated experiences more growth and the advanced countries are enjoying more benefits of integration because of high quality of institution, and also because of absence of less restrictions on trade and capital [Dreher, Gaston, and Martens (2008)].

The KOF index of globalization is used to analyze globalization and economic growth relationship by Chang and lee (2010), Leitao (2012), Dogan (2013), Faridullah et. al.,

[2] Sachs Warner (1995) and Dollar and Kraay (2001) examined the relationship between trade openness and economic growth and suggested positive and significant impact of trade openness on economic growth. For the foreign direct investment, Borensztein et al., (1998) found a positive and significant impact on growth.

[3]The index is built on economic, social and political aspects of globalization. These dimensions are measured by 23 variables which are combined to develop three sub-indexes, which are then presented as single index of globalization named as KOF index.

(2014), Kilic (2015), Elsherif (2016), and İncekara and Savrul (2017). Chang and lee (2010) investigated the growth effects of globalization index for 23 OECD (Organization for Economic Co-operation and Development) countries from the time period 1970-2006. The estimation technique Pedronis panel Cointegration is employed to empirically evaluate the causal relationship between globalization measures and economic growth. The empirical evidence shows weak short-run causality whereas unidirectional long-run causality from globalization to growth. The beneficial impact of globalization on growth is further supported by Kilic (2015). Author examines the impact of economic, social and political globalization on economic growth for 74 developing countries from time period 1981 to 2011 by using fixed effect least square approach. The results suggest significant and positive impact of economic and political globalization on growth, whereas negative impact of social globalization. These results are further supported by the study of Olimpia and Stela (2017). First, they investigated the impact of overall KOF index of globalization and then its dimensions on economic growth for Romania, from 1990 to 2013 by least square method. The overall KOF index shows positive and significant impact on economic growth. The estimates from sub-dimensions of globalization display positive and significant impact of economic and political globalization on economic growth whereas social globalization affects economic growth negatively.

Majidi (2017) investigated the economic growth effects of globalization for developing countries from 1970 to 2014. The study categorized the countries in two groups; higher middle income and lower middle-income countries. By using fixed effect estimation technique, the results of higher middle-income countries show insignificant impact of overall KOF index on economic growth. In terms of dimensions, social globalization has positive and significant impact while political globalization shows significantly negative impact on economic growth whereas economic dimension displays insignificant affect. On the other hand, in lower middle-income countries growth effect of overall KOF index of globalization is positively significant. The economic and political globalization has positively significant while social globalization has insignificant impact on economic growth. The study concludes that low and middle-income countries benefits more from globalization as compare to higher middle-income countries.

In the following year, Titalessy (2018) contributed to literature on globalization and economic growth nexus, by analyzing the impact of economic, social and political dimension of KOF index on economic growth of Asia-Pacific counties from 2000 to 2014. By employing fixed effect method, economic and political globalization show positive and significant impact on economic growth while social globalization significantly affects economic growth negatively. Similarly, Kilicarslan and Dumrul (2018) carried out analyses on impact of Economic, Social and political globalization on economic growth in Turkey from 1980 to 2015. The study employs Johansen and Full Modified Ordinary Least Squares (FMOLS) Cointegration method. According to the results, economic and social globalization significantly affects economic growth positively whereas political globalization shows significant and negative impact of globalization on economic growth in Turkey.

In amid of positive impact of globalization on economic growth in terms of foreign capital inflows, information and ideas, diffusion of technology and knowledge and increase in the employment level, the current rise in terrorism has caused serious threat to economic growth. Direct channel includes destruction of infrastructure, loss of lives and cost related to injured person in the form of loss of wages and job deprivation while the indirect channel includes reduction in foreign investment. Sandler and Enders (2008) explains that terrorism decreases both domestic and international investment by increasing uncertainty in the economy, which raises financial risk and causes investors to invest in a risk-free zone to avoid losses. Furthermore, the decrease in investment is also due to destruction of infrastructure, limited productive capital for business and slowdown in transportation of good and services due to destruction of transportation networks [Enders, Sachisela and Sandler (2006)].

Moreover, terrorism crowds out public expenditure from growth enhancing assets such as infrastructure, health and education to security measures. These defensive measures draw out the productive labor and capital from productive projects to unproductive security projects which results in lowered economic returns [Koh (2007)]. According to Nitsch and Schumacher (2004), terrorism reduces the degree of trade. The counter terrorism policies which include tightness of security at borders and ports can increase the cost of trade by increasing delivery time of products, which results in disruption of supply leading to decrease in profitability of firms. According to Enders and Sandler (1991), tourists are the soft target of terrorism and the countries with high number of terrorist attacks experiences low tourism activity.

Gaibulloev and Sandler (2008) estimates the effect of terrorism on economic growth of 18 western economies. The study explores the impact of transnational and domestic terrorism separately on economic growth. By using random effects estimation technique, the result shows that rise in transnational terrorism incidents decreases economic growth by 0.4%, whereas domestic terrorism have low negatively significant affect. The study concludes that transnational incidents reduce economic growth by crowding out investment whereas domestic terrorism decreases economic growth by increasing unproductive government expenditure. Similarly, Gaibulloev and Sandler (2009) explore the impact of terrorism and conflict on income per capita growth of 42 Asian economies. The study has separately investigated the effect of transnational and domestic terrorism on growth. The result shows that transnational attacks in Asian countries reduced economic growth by almost 1.4 percent annually. Among others, Gaibulloev and Sandler (2010), Bloomberg et. al., (2004) and Edobar (2012) investigated the relation between terrorism and economic growth in Africa. All studies suggest detrimental effects of terrorism on economic growth. Similarly, Çinar (2017) analyzed the direct impact of terrorism from 2000-2015 on 115 countries divided in higher income, upper-middle income, lower-middle income and lower income categories. The study employs fixed effects and random effects model and displays negative effect of terrorism on economic growth for all four categories. However, the detrimental effect of terrorism on economic growth is three times higher in lower income countries compare to higher income countries due to weak fiscal and

monetary policy tools in lower income countries. Similarly, Bayar and Gavriletea (2018) examined the impact of peace and terrorism on economic growth in 18 Middle East and North African countries. The findings conclude that peaceful environment positively effects economic growth whereas terrorism effects economic growth negatively.

The above cited studies concluded that terrorism adversely affect economic growth through direct and indirect channels. However, limited literature exists that analyzed the growth effects of globalization in interaction with terrorism in a broader sphere for Asian and African developing countries. Our study contributes to the literature not only by incorporating both effects but also by using an index encompassing economic, social and political globalization for Asian and African developing countries. Moreover, the study offers the country-specific marginal effect of globalization in interaction with terrorism on economic growth that is helpful to identify country's respective standings to deal with terrorism. In addition, this study computes and provides the threshold level of terrorism that may be useful for policy suggestion. Next section provides an overview of the Asian and African countries experience of globalization and terrorism.

3. TERRORISM EXPERIENCE IN ASIA AND AFRICA: A BRIEF

Since 1970s, Asian region has been facing terrorism threats and with the rise of fundamentalist terrorist organization in 1980s there have been many dreadful terrorist incidents taken place in Asia. According to Gaibulloev and Sandler (2009), terrorist's attacks in Asian countries reduced economic growth by almost 1.4 percent annually. Middle East and South Asian countries not only faced the direct growth impact on different sectors of the economy, they have also confronted with the serious challenge to globalization in the form of limiting international trade, diverting foreign direct investment, shrinking tourism industry and weakening international relations. In particular, terrorism created worse law and order situation in Bangladesh which halted foreign investment resulting in the underdevelopment of such a resource enriched country. Similarly in Nepal where tourism industry contributes 15 percent of total foreign exchange earnings and 5 percent of total GDP, the persistent violent attacks have affected tourism industry negatively leading towards the decline in socio-economic globalization and consequent reduction in economic growth.

In South Asia, Sri Lanka was the first country to liberalize its economy in 1977, but it could not get benefits of integration because of persistent terrorism [Khatri and Kueck (2003)]. Similarly, the economy of Pakistan has been under serious economic pressures due to war against terrorism, which has been consistently on rise except for few years over the decades. Since 2003, the war has broadened immensely in Pakistan and the cost is materialized in infrastructure destruction ($ 0.19 billion), internal migration, rising unemployment and loss to the industrial output ($ 0.03 billion) beside the death toll. According to Economic Survey (2015-16), exports and foreign investment faced a loss of US$ 1.88 billion and US$ 6.60 billion, respectively due to

incidents of terrorism while the direct and indirect cost incurred by Pakistan amounted to US$ 118.31 billion during last 14 years. Furthermore, the intensification of domestic security challenges imposed additional cost for maintaining law and order, training of security forces and upgrading weapons that has exerted adverse pressure on the economy in the form of larger fiscal deficit and cutting down on socio-economic development projects. Unfortunately, Pakistan has been facing terrorism particularly for being the 'frontline state' in the 'Global War on Terrorism'.

Coming to the African experience, post-1990's period observed African countries being severely affected by the terrorism. Since then, the economic cost of terrorist attacks has been on rise with the loss of human and physical capital. The violent attacks in African region has increased the cost of business, inflated uncertainty in financial market and has diverted the external as well as internal investment. The tourism industry, international trade and short-term capital flows are also adversely affected by terrorism. According to World Investment Report (2015), FDI fell down from 4.4 percent to 2.8 percent in the wake of terrorism. The dreadful tourists attack in Egypt, car bomb attack in Kenya, Somalia Black Hawk incident, bombing of US embassies in Kenya and Tanzania has resulted in devastated economic consequences. These attacks have caused significant downturn in investment along with upsetting the airline and tourism industry.

Africa has been an important source of natural resources including most vital source oil and the discovery of rich offshore oil reserve could lead to improve the status of African oil supplier. However, the terrorist attacks disrupted the crucial supply lines to the industrial world deterring the growth and development of the region [Gaibulloev and Sandler (2010)].

Based on the foregoing discussion, globalization can significantly improve economic growth of developing countries, but the waves of terrorism may pose serious threat to the growth effect of globalization.

4. METHODOLOGY

4.1 Theoretical Background

Theories of economic growth can be traced back to Solow growth model (1956). This model introduced capital accumulation, labor force and technology as main engine of growth with the assumption of diminishing marginal return to capital and has its roots in the Cobb Douglas production function. The model was criticized by Mankiw, Romer and Weil (1992) for its inability to discern the factors behind international economic growth as the marginal productivity of capital is relatively slow in poor countries due to mismatching human capital. Here forth, they extended Solow growth model by incorporating accumulated human capital however population and technological growth were still being considered as exogenous.

As the assumption of exogenous technology and decreasing return to capital did not satisfy some growth doctrine, the research in growth theories took new directions and emerged as the endogenous growth model. Late 20th century turned the focus on neo-liberal channel of growth besides accumulation of capital in determining the long-run growth in the wake of rising globalization. Endogenous growth theory provides a direct and long-run theoretical connection between globalization and economic growth through the channels of international diffusion of technology, improvement in factor productivity, capital augmentation, knowledge spillover, effective resource allocation and also by imitation.

4.2 Model Specification and Data Description

The dynamic model for regression is specified as below:[4]

$$\begin{aligned} GGDPPC_{it} = {} & \beta_0 + \beta_1 GGDPPC_{i,t-1} + \beta_2 ILGDPPC_{it} + \beta_3 GKS_{it} + \beta_4 HC_{it} + \\ & \beta_5 INFL_{it} + \beta_6 IQ_{it} + \beta_7 GLOB_{it} + \beta_8 (TER * GLOB)_{it} + \beta_9 RDum_{it} + \mu_{it} \end{aligned} \quad (1)$$

Where, 'i' represents the selected developing countries of Asia and Africa and 't' refers to the time period. This study used five years average of non-overlapping data from 1984 to 2013, to reduce the contemporaneous correlation, potential short-term cyclical fluctuations and non-stationary effects that may exist in yearly data following Younas (2015) and Adams and Sakyi (2012). The dependent variable, $GGDPPC_{it}$ indicates growth of real GDP per capita. The major variables of the study i.e., globalization and terrorism are denoted by GLOB and TER.

As discussed earlier, globalization is a multidimensional phenomenon and in order to measure it such index was required that can encapsulate all of its dimensions. KOF index (2016) of globalization, compiled and updated by Dreher (2006, 2008), provides the ranking of global countries on the basis of three dimensions: economic, political and social dimension. These dimensions are basically captured by using twenty-three variables and an application of Principal Component Analysis composes these variables to form three indices. These indices are further aggregated into a single comprehensive index of globalization. On the basis of this principal, social globalization is assigned weight of thirty seven percent, thirty six percent weight to economic globalization and twenty seven percent weight to political globalization. Overall globalization index is scaled from 1 (minimum globalization) to 100 (maximum globalization).[5]

Similarly, four different measures are used to capture the extent of terrorism. The occurrence of terrorist attacks is apprehended by taking the total number of incidents. For the intensity of attack, total number of deaths and injuries are used. Finally, in order to measure the extent of terrorism relative to country's population, an index

[4] The equation is first estimated with terrorism and globalization variables; secondly it is estimated by taking globalization and interaction term of globalization and terrorism with other standard variables. Terrorism variable is not included in all even numbered equations in order to avoid over fitting of model as reported in Table 2.

[5] See Dreher (2006, 2008) for further detail.

scaled to population is constructed.[6] Following Dreher et. al., (2011), equal weighted index is constructed by using following formula:

$$\text{Terrorism index}_{it} = \ln(e + \frac{\text{attacks}_{it}}{\text{pop}_{it}} + \frac{\text{Casualties}_{it}}{\text{pop}_{it}}) \quad (2)$$

Where, attack indicates total number of terrorism incidents in a country whereas casualties represent the sum of total number of deaths and wounded because of attacks. The variables are defined in detail with their data sources in Table 1.

In order to investigate the growth effects of globalization in the presence of terrorism, we did one step ahead calculation from model.

$$\frac{\partial \text{GGDPPC}_{it}}{\partial \text{GLOB}_{it}} = \beta_7 + \beta_8 \overline{\text{TER}} \quad (3)$$

In expression (3), β_7 represents the coefficient of globalization, while β_8 indicates the coefficient of interaction term. $\overline{\text{TER}}$ refers to the average value of terrorism in the sample.

Additionally, the level at which terrorism offsets the positive growth effect of globalization (threshold level) is captured by applying the first order condition:

$$\frac{\partial \text{GGDPPC}_{it}}{\partial \text{GLOB}_{it}} = \beta_7 + \beta_8 \text{TER} = 0 \quad (4)$$

Simplifying equation (4) yields following expression:

$$\text{TER} = \left(-\frac{\beta_7}{\beta_8}\right) \quad (5)$$

The estimated threshold value of terrorism implies that beyond this value positive growth effect of globalization will be reversed.

[6]According to Bandyopadhayh et al. (2013), terrorism variable relative to country population provides better reflection of terrorism threat in a country.

Table 1. Description of Variable and Data Sources

Variables	Description	Data Sources
GGDPPC	Growth of GDP per capita (annual percentage), measured in 2005 US dollar	World Development Indicator by World Bank
iLGDPPC	Refers to the initial GDPPC at the start of each period	----do----
INFL	Inflation (change in consumer price index, annual percentage)	----do----
Population	Population in respective country	----do----
HC	Human capital index per person, based on years of schooling (Barro and Lee 2013) and returns to education (Psacharopoulos 1994).	PWT 8.1 by Feenstra, Robert C., Robert Inklaar and Marcel P. Timmer
GKS	Growth rate of capital stock calculated by percentage change. Capital stock is estimated by using accumulation and depreciation in past investments using the Perpetual Inventory Method (PIM), measured in 2005 US dollar.	PWT 8.1 by Feenstra, Robert C., Robert Inklaar and Marcel P. Timmer
IQ	The Institutional Quality is measured by four indicators. (i) quality of bureaucracy (ranges 0–4) which measures institutional strength, quality of bureaucracy and the autonomy from political pressure; (ii) law and order (ranges 0–6) which reflects the strength and impartiality of the legal system and popular observance of the law; (iii) corruption (ranges 0–6) which refers to corruption in the political system. Countries, with low level of corruption, have high index values and vice versa. (iv) Democratic accountability (ranges 0–6) which measures responsiveness of government towards its people.	International Country Risk Guide (ICRG) variables from the Political Risk Services (PRS) Group
Glob	Globalization is measured by KOF index of globalization, which ranges from 0 (no globalization) to 100 (maximum globalization).	KOF index of globalization
Terror	For terrorism three indicators are taken from terrorism database which are (i) Total number of incidents; (ii) Total number of deaths; (iii) Total number of injured.	Global Terrorism Database
Rdum	Regional dummy is assigned value 1 for Asian and 0 for African countries.	

4.3 Justification of Variables

The variables are included on the ground of economic theory and theoretical expectations. The log of initial real GDP per capita at start of each period is used to check the convergence hypothesis and is expected to yield negative coefficient. The growth of capital stock and index of human capital are expected to have positive impact on economic growth as per standard growth model. The inflation rate, used as stability indicator, is expected to have negative effect on economic growth. Regarding institutional quality it is expected to have positive sign as the quality institution leads to efficient allocation of resources and improvement in economic growth.[7] Similarly, lagged GDP per capita growth is used to analyze the autoregressive behavior of dependent variable.

The effect of globalization on GDP per capita growth is expected to be positive. Through the development of worldwide information system, information about new goods and services become more accessible and a firm across the borders can gain from the positive externality of knowledge spill over to improve its production. In contrast, the expected effect of terrorism on GDPPC growth is negative in the form of loss of infrastructure, loss of lives and cost related to injured person in the form of loss of wages and job deprivation and loss of FDI and falling trade, investment and capital [Sandler and Enders (2008)]. Furthermore, terrorism can affect countries by depressing their spending on development projects due to limited fiscal space and rising expenditures on security measures as also pointed out by Koh (2007). Similarly, the coefficient for the interaction between globalization and terrorism term is expected to be negatively significant suggesting the mitigating role of globalization on economic growth in the presence of terrorism. Finally, regional dummy (Rdum) is added in order to consider the structural differences pertaining to the difference in economic growth between Asian and African region.

4.4 Estimation Technique

As the growth of real GDP is a dynamic process and has 'push and pull' effects from the previous level of economic growth, the application of Least Squares technique on an inherently dynamic model can lead to inconsistent results and can also ignore cross-country unobserved heterogeneity. Furthermore, the growth models mostly encounter the endogeneity among variables that can't be controlled with OLS. Keeping in view these limitations, dynamic Generalized Method of Moment (GMM) estimation technique is considered to be the most appropriate technique. The 'Difference and System GMM' approach by Arellano and Bond (1991) are designed for dynamic panel estimation with shorter time length and larger cross sections. The basic idea behind difference GMM is to transform the equation into first difference and to use the lag value of explanatory variables as instruments. This technique eliminates the country specific fixed effects and resolves the problem of omitted variables bias that may affect the growth model. However, for shorter time series, the

[7] These variables are used alternatively in estimating equations because of collinearity among them.

growth model with data averaged for 5 years is more likely to posit weak instruments in the form of lagged explanatory variables.

An alternative technique to difference-GMM is the system-GMM that is an extended form of linear differenced GMM estimators and exploits the additional linear moment conditions. This technique uses level form of equation in addition to the difference equation and the first difference form of the variables is used as instruments for the level equations. This technique leads to the more efficient estimators and also removes the small-time horizon and endogeneity problems [Roodman (2006; 2007)].[8]

The consistency of S-GMM depends on the validity of instruments. For this purpose, two specification tests will be used. First is the test of autocorrelation of residuals AR (2) which hypothesizes that there is no second order serial correlation. Second test is based on exogeneity of instruments, the Hansen J test.[9] Now we turn to the empirical results and interpretation.

5. ESTIMATION RESULTS

The empirical findings based on system GMM regression are reported in Table 2. The estimation is carried out for four different measures of terrorism; number of incidents, deaths, wounded and overall terrorism. The results are reported for terrorism and globalization index with and without controlling the interaction term in all odd and even numbered columns, respectively.[10]

The diagnostic tests for instruments validity and exogeneity are reported in lower panel of Table 2. Particularly, Hansen J test reports the p-values ranges from 0.322 to 0.758 throughout the regressions indicating that all instruments used in regressions are exogenous. Furthermore, the instruments used in estimation are equal or less than number of groups which further strengthen the soundness of Hansen test. The AR test for autocorrelation yields the p-value ranges from 0.211 to 0.339, an indication of no second order serial correlation. Moreover, all signs of coefficient are per expectations and economic theory and remain fairly stable throughout the regressions.

Turning towards the detail discussion of results, estimates from all regressions provide that globalization plays significantly positive role in fostering economic growth in selected Asian and African developing countries over the given time period.[11] The result in column (8) for overall terrorism index shows that one unit increase in globalization is associated with 0.175 percent increase in economic growth. This postulates that globalization enhances growth in developing countries by transferring technology and knowledge from developed economies.

[8]The detailed mechanical framework is provided in appendix A.2.
[9]Roodman (2007) proposed that P-value should be less than 1.00 because perfect P-value is the indication of weak instruments.
[10] The estimation is carried out in STATA 13.
[11] The results of column (8) are discussed in detailed only, for parsimony.

Table 2 S-GMM Estimates of Globalization on Growth

Dependent Variable: Gross Domestic Product Per Capita Growth

Variables	Incidents		Deaths		Wounded		Terrorism Index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
C	3.307 (2.021)	2.387 (1.802)	4.699** (2.208)	3.464 (2.186)	3.584* (2.055)	3.263 (2.161)	7.850** (2.970)	4.153* (2.054)
$GGDPPC_{i,t-1}$	-0.221* (0.119)	-0.199* (0.097)	-0.206* (0.120)	-0.203** (0.096)	-0.223* (0.119)	-0.212** (0.096)	-0.427* (0.229)	-0.220* (0.125)
$ILGDPPC_{it}$	-1.933*** (0.674)	-1.401*** (0.483)	-1.952*** (0.642)	-1.231** (0.548)	-1.972*** (0.667)	-1.192** (0.562	-2.671*** (0.690)	-1.985*** (0.657)
HC_{it}	-0.132 (1.034)	0.266 (0.868)	-0.084 (1.044)	-1.378 (1.433)	-0.091 (1.066)	-1.482 (1.526)	0.263 (1.704)	0.045 (1.289)
GKS_{it}	0.508*** (0.075)	0.508*** (0.083)	0.500*** (0.074)	0.498*** (0.093)	0.506*** (0.075)	0.499*** (0.096)	0.574*** (0.165)	0.501*** (0.072)
INF_{it}	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Law_{it}	0.855*** (0.285)	0.909*** (0.265)	0.861*** (0.291)	0.860*** (0.303)	0.873*** (0.294)	0.874*** (0.311)	1.293** (0.541)	0.726*** (0.238)

Continued on next page

(Continued) Table 2 S-GMM Estimates of Globalization on Growth

Variables	Incidents		Deaths		Wounded		Terrorism Index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rdum	1.474* (0.729)	1.373** (0.645)	1.737** (0.733)	1.921** (0.760)	1.606 ** (0.758)	1.913 ** (0.773)	2.110** (0.853)	1.619** (0.720)
$Glob_{it}$	0.146* (0.080)	0.067* (0.037)	0.131* (0.075)	0.089* (0.047)	0.143* (0.079)	0.091* (0.049)	0.169* (0.091)	0.175* (0.087)
Ter_{it}	-0.002** (0.001)	-	-0.003* (0.001)	-	-0.001*** (0.000)	-	-1.881*** (0.667)	-
$(Ter*Glob)_{it}$	-	-0.00004* (0.00002)	-	-0.00005* (0.00003)	-	-0.00004** (0.00002)	-	-0.059* (0.029)
No of observations	157	156	157	156	157	156	157	157
No of countries	32	32	32	32	32	32	32	32
No of instruments	30	32	30	30	30	30	30	31
Diagnostic Test								
Hansen J Test	0.608	0.583	0.758	0.553	0.662	0.322	0.638	0.601
Arellano-Bond test for AR (2)	0.316	0.336	0.314	0.339	0.298	0.328	0.211	0.297

Note: 1. *, ** and *** represents significance at 10%, 5% and 1% respectively. 2. Standard error in parentheses. 3. P-values for diagnostic test are reported. 4. The model was also estimated by using other variables of institutional quality like bureaucratic quality, democratic accountability and corruption but due to statistical insignificance they are not reported here.

This point of view is consistent with Barro and Sala-i-Martin (1995); high level of integration in countries is associated with the high level of opportunities to get benefits from technology and innovations of advanced countries. Globalization also leads to increase foreign investment that provides employment opportunities with the knowledge spillover and transfer of advanced technology and new production techniques.[12] Additionally, globalization plays important role in stimulating physical and human capital by enhancing organizational and administrative skills and knowledge of human capital.[13] The findings of this study are consistent with Rao and Vadlamannati (2011), Dreher (2006) and Kim et.al. (2014).

The findings for terrorism variables, using four different measures and reported in column (1), (3), (5), and (7), suggest that all coefficients have statistically significantly negative effect on economic growth. The results are consistent with the finding of Younas (2015) and Gaibulloev and Sandler (2009). The coefficients indicate that one unit increase in terrorist incidents decreases economic growth by 0.002, 0.003, 0.001 and 1.881 percentages, respectively. Although the terrorism coefficients are not directly comparable, overall terrorism index has subdued economic growth with the highest margin most noticeably.

Terrorism affects economic growth directly by destructing physical capital, loss of human capital and the loss of wages of injured person. Indirect impact of terrorism on economic growth includes loss of FDI and domestic investment and capital outflow because of increase in uncertainty in the economy. Likewise, terrorism affected countries face declining development projects funding because of the turning focus of government towards counter-terrorism expenditures. According to Koh (2007), increase in government counter-terrorism spending crowds out growth enhancing development project and reduces the economic growth.

Turning to other variables in the model, initial log of gross domestic product per capita is found to be negative and statistically significant in all regressions. It confirms the inverse relationship between initial level of gross domestic product per capita and its consequent growth, controlling for the steady state differences among selected developing countries. These results are in line with the conditional convergence hypothesis [Fukuda and Toya (1995) and Erich (1996)].

The growth of capital stock has positively significant impact on economic growth with all four measures of terrorism. The coefficient of growth of capital stock shows, one percent increase in growth of capital stock increases the gross domestic product per capita growth by 0.501 percent. The empirical findings for human capital suggest positive but insignificant impact of human capital on economic growth. In literature, it's a general assertion that human capital plays an important role in fostering economic growth. However, in some studies evidence is negative or insignificant as

[12] The separately estimated equations for economic, social and political globalization are not reported for parsimony but can be provided on demand.
[13] However, the link of human capital in isolation is not significant in regression.

well like Benhabib and Spiegel (1994).[14] More precisely, Pritchett (2001) provided that in developing countries due to low returns and poor institutional and educational setup the insignificant impact of human capital on economic growth is not novel.

The coefficient of inflation is significantly negative for all equations of terrorism ranges from -0.001 to -0.007 percent. A rise in inflation increases the cost of capital and discourages investment which leads to depress capital accumulation and hence growth, findings consistent with Burdekin et al. (1994) and Vinayagathasan (2013). Coming to the institutional factors, the law and order has positive and statistically significant impact on economic growth. Law and order ensures security of personals by providing well established legal framework and property rights, accountability of government and checks on corruption that creates an economic environment for efficient resource allocation in the country. It also provides conducive environment for investment by alleviating the uncertainty as suggested by Haggard and Tiede (2013).

The coefficient for regional dummy is positive and significant in all equations and shows that average per capita economic growth in Asian developing countries has remained more than African developing countries by 1.619 percent. In spite of terrorism threats, Asian countries are apprehending faster economic growth than African developing region due to better economic reforms and policy interventions. The export-oriented policies and incentives for foreign investment in industrial sector has remained important development trajectories in Asian region. They developed their manufacturing sector, value added services and agro-based industries to grow up with the demand of global economy (China and India are major examples) while in African countries the manufacturing sector couldn't develop due to investment lapse. Moreover, the Asian region has invested their resources towards human and physical capital more than African countries and are able to attain high life expectancy and literacy rate. Similarly, infrastructure including transport and communication services is more advanced in Asian region that attracts more FDI towards it than Africa.

5.1 Marginal Effects of Globalization

As mentioned earlier, the moderating effect of globalization on economic growth in the manifestation of terrorism is observed by including the interaction term of globalization and terrorism. The empirical result shows negatively significant coefficient for the interaction term. The results are reported in even columns (2) through (8) and indicate that terrorism alters the globalization and growth relation.

As the effect is not directly observable, we calculated the marginal effect of globalization on the average value of terrorism index i.e., 1.5 percent, to elucidate the findings. The calculation from column (8) based on the expression (4.2.2) shows that positive growth effects of globalization declines from 0.175 percent (coefficient

[14] This is asserted that the data used for measurement of human capital is not a true reflection of human capital.

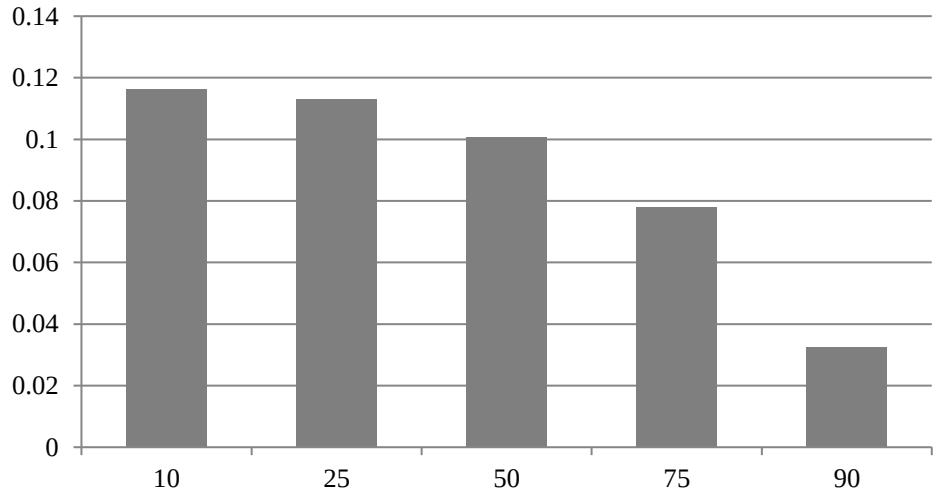
without interaction of terrorism) to 0.086 percent [0.175-0.059(1.5)][15]. The results suggest that terrorist incidents can mitigate the positive effect of globalization on economic growth. Terrorism affects trade adversely by increasing delivery time of goods due to increased security and adoption of high border precautions (Nitsch and Schumacher, 2004). Moreover, tourists are the soft target of terrorism; countries with high number of terrorist attacks experience a downturn in tourism industry which reduces the revenues and hence economic growth (Enders and Sandler, 1991).

5.2 Marginal Effects of Globalization on Various Levels of Terrorism

To analyze the growth effect of globalization at various level of terrorism, we have evaluated the marginal effect of globalization at 10th, 25th, 50th, 75th and 90th percentile of terrorism on column (8) of Table 2. The estimates reported by Figure 1 shows that at successively higher level of terrorism, the positive effect of globalization tends to be lower.

The figure clearly portrays that terrorism reduces the growth effect of globalization by an ample margin, starting at 0.1163 percent at 10th percentile of terrorism followed by 0.1131percent at 25th percentile. The subsequent percentiles of terrorism illustrate a sharp fall in economic growth lying at 0.1007 percent and 0.0778 percent at 50th and 75th percentile, respectively. Finally, at 90th percentile the magnitude further reduced to 0.0324 percent.

Figure 1 Marginal Effects of Globalization at Percentiles of Terrorism

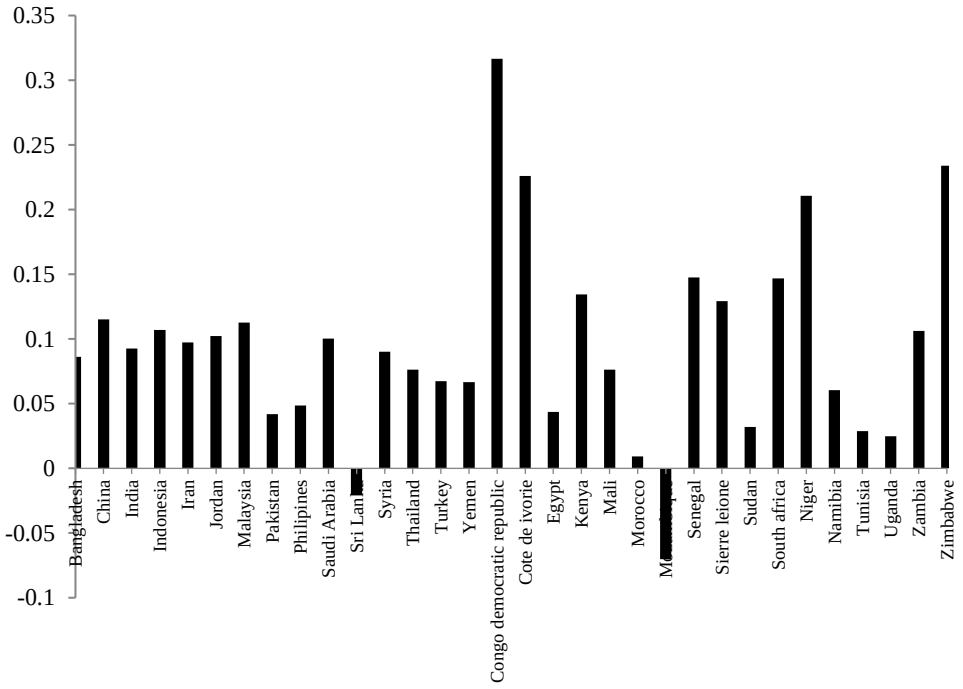


[15] $\frac{\partial GGDPPC_{it}}{\partial GLOB_{it}} = coefficent\ of\ Glob. + coeffeicent\ of\ interaction\ term * \overline{TER}$

5.3 Country-Specific Marginal Effects of Globalization on Economic Growth

Figure 2 identifies the marginal differences in the growth's effect of globalization across the selected countries on respective averages of terrorism. The graph clearly shows that the countries prone to high terrorism have faced larger decline in the positive effect of globalization on growth. Asian countries are not a way different from African countries in facing these threats. In the presence of terrorism, not only foreign but also domestic physical and human capital flight takes place and put a halt on the economic growth.

Figure 2 Marginal Effects of Globalization at Countries Terrorism level



Threshold of Terrorism

Additionally, the threshold level where terrorism can offset the positive effect of globalization on economic growth is calculated from the estimates of column (8) based on expression 4.2.4 and the calculated value is 2.96.This implies that crossing the alarming limit of terrorism not only mitigates the positive effects of globalization on economic growth but it also reverses the effect. A close look at the graph 5.3.1 and the terrorism episodes identifies two countries Sri Lanka and Mozambique as outliers; country lying above the threshold level. Threshold value indicates the occurrence of extreme terrorism where positive effect of globalization on economic growth is nullified rendering a net negative effect on growth. Specifically, Sri Lanka has long

been facing severe terrorists' attacks. Over the past 26 years, Tamil tigers carrying most dreadful attacks has cost Sri Lankan economy a loss of US$200 billion whereas in term of human capital about 59,193 to 75,601 people have lost their lives in Sri Lanka conflict from 1990 to 2009 (UCDP, 2011). Later, the deadly terrorist attack on Bandaranaike International Airport in Sri Lanka in 2001 adversely affected the country's economy touching a negative growth hit at 1.4 percent while the tourism industry plunged by more than 15 percent. Similarly, the tourism sector suffered an overall tourists' drop of 11.7 percent and 31.4 percent in year 2007 and 2008, respectively. Meanwhile, trade deficit widened by 78 percent and increased from $3.56 billion in 2007 to $5.17 billion in 2008 and FDI lost by $ 3 billion in the time span of 24 years.[16]

In Mozambique, most of the terrorist incidents are carried out by Renamo (Resistência Nacional Moçambicana) a rebellious military organization. It emerged in 1972 against the country ruling party Mozambique Liberation Front (FRELIMO). From 1972-1992, Mozambique has been suffering from severe conflicts. One of the most atrocious attacks was in 1987, in which 427 people were killed. With some ups and down and peace treaty in 1992, the country is still struggling with improving economic growth in the wake of terrorism episodes.

6. CONCLUSIONS AND POLICY IMPLICATIONS

The growth effect of globalization in the wake of terrorism in selected Asian and African developing countries over the time period 1984-2013 was analyzed in this study. For measuring globalization, multidimensional KOF index was used whereas for terrorism four variables; number of incidents, deaths, wounded and overall terrorism index were used. The Systematic-GMM was employed for estimation. The empirical results showed that although globalization tends to enhance the economic growth for selected developing countries in Asia and Africa, but terrorism has mitigated the growth impact of globalization by depressing foreign investment, international trade and tourism. The threshold value for overall globalization index pointed out that a significantly high level of terrorism can completely offset the positive bearing of globalization on economic growth.

Furthermore, the study identified the capital stock and sound law and order conditions as significant contributor to economic growth, while inflation has appeared with negative impact. The initial value of log of gross domestic product per capita justifies the convergence hypothesis for selected panel while the regional dummy yielded relatively higher per capita economic growth in Asian region than African.

The empirical findings suggest that the selected Asian and African developing countries need to encourage domestic saving and investment to increase the capital

[16]Ganegodage and Rambaldi (2014) reported that an outflow of skilled and educated citizens from Sri Lanka (in the wake of terrorism) has adversely affected the economic growth.

stock for being a strong positive contributor of economic growth. This can be done by providing budgetary incentives for the domestic saving to avoid debt trap. Besides, these countries need to revamp their trade and financial liberalization policies to accommodate new wave of multidimensional globalization. The law and order situation is needed to be improved by the good governance and political stability. For encountering terrorism, countries need to deal it with cautious step towards sustainability. The source of supply of weapons must be eliminated and the persons involved in financing, planning and supporting terrorist must be encountered strategically. Particularly, the countries above the threshold level need to be more observant in adopting anti-terrorism measures, in order to avoid declining economic growth.

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Appendices

Table A.1

List of Countries

Asian Countries		African Countries	
Bangladesh	Pakistan	Congo Democratic Republic	Sierra Leone
China	Philippines	Cote De Ivorie	Sudan
India	Saudi Arabia	Egypt	South Africa
Indonesia	Sri Lanka	Kenya	Niger
Iran	Syria	Mali	Namibia
Jordan	Thailand	Morocco	Tunisia
Malaysia	Turkey	Mozambique	Uganda
	Yemen	Senegal	Zambia
			Zimbabwe

A.2 S-GMM Framework

The growth equation in dynamic framework can be written as:

$$y_{i,t} = y_{i,t-1} + \beta X_{i,t} + \delta_i + \mu_{i,t} \quad \text{(A.1)}$$

In the above equation $y_{i,t}$ and $y_{i,t-1}$ represents dependent variable and lag of dependent variable whereas $X_{i,t}$ indicates explanatory variables. Furthermore, δ_i depict cross country fixed effects and $\mu_{i,t}$represent error term.

The first difference equation developed Arellano and Bond (1991) is written as:

$$(y_{i,t} - y_{i,t-1}) = (y_{i,t-1} - y_{i,t-2}) + \beta(X_{i,t} - X_{i,t-1}) + (\mu_{i,t} - \mu_{i,t-1}) \quad \text{(A.2)}$$

Following the assumptions that error term and lagged dependent variable are not serially correlated and the explanatory variables $X_{i,t}$ are weakly exogenous, the dynamic GMM uses the following moment conditions to incorporate instruments in the differenced equation.

$$E[y_{it-s}, \Delta\varepsilon_{it}] = 0 \quad \text{For each } s \geq 2, t = 1, \ldots T \quad \text{(A.3)}$$

$$E[X_{it-s}, \Delta\varepsilon_{it}] = 0 \quad \text{For each } s \geq 2, t = 0, \ldots T \quad \text{(A.4)}$$

This assumption can be specifies by following equation:

$$E[y_{i,t+p}\eta_i] = E[y_{i,t+q}\eta_i] \quad \text{and} \quad [X_{i,t+p}\eta_i] = E[X_{i,t+q}\eta_i] \quad \text{(A.5)}$$

In the above equation t, p and q indicates time period. The additional moment conditions in order to incorporates instruments in level equation can be written as:

$$E[(y_{i,t-s} - y_{i,t-s-1})(\eta_i + \mu_{i,t})] = 0 \quad \text{for } s = 1 \quad \text{(A.6)}$$

$$E[(X_{i,t-s} - X_{i,t-s-1})(\eta_i + \mu_{i,t})] = 0 \quad \text{for } s = 1 \quad \text{(A.7)}$$