

Impact of Terrorism, Foreign Direct Investment (FDI) and Energy Consumption on the Economic Performance: A Case of South Asian Economies

Alam Khan^{1*}, Muhammad Tahir², Ihtisham ul Haq¹ and Nanthakumar Loganathan³

1-Kohat University of Science & Technology (KUST), Khyber Pakhtunkhwa, Pakistan

2-COMSATS University Islamabad, Abbottabad Campus, Abbottabad, Pakistan

3-Azman Hashim International Business School, Universiti Teknologi Malaysia, Johor Bahru, Johor Malaysia

*Corresponding Author: alamkhan@kust.edu.pk

ABSTRACT

Foreign investment and finance are considered key to economic growth for many economies. In terrorism, these economies directly lose international capital. As a result, it causes an adverse impact on economic development in the countries. Human capital and natural capital factors will be fruitful when the environment is conducive and peaceful. Similarly, energy consumption and FDI would stimulate economic growth, subject to the absence of law-and-order issues. This manuscript investigated the impact of terrorism, energy consumption and FDI on economic growth in South Asia over the period from 2002 to 2020. The model's results display that terrorism and FDI have a negative impact on economic growth in South Asia. The result of energy consumption exhibits a positive and significant influence on economic growth in South Asia. Further, the results indicate that domestic investment and education in South Asia positively impact economic growth. Consequently, it is suggested that the South Asia countries should take appropriate actions to eradicate the problem of terrorism, ensure the availability of energy, and improve the labour force's skills to achieve desirable economic growth.

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INTRODUCTION

One pre-condition for economic growth is peace, harmony and political stability. Terrorism does affect not only peace and harmony but also socio-economic aspects and political stability. Typically, terrorism is considered an act of violence (Enders et al., 2006). Further, terrorism badly affects public infrastructure, physical and human capital, managerial activities, and political stability. Furthermore, domestic and foreign investments are also influenced by terrorism. Terrorism affects investors psychologically, which leads to degraded economic growth. Tourism and trade volume shrink due to uncertainty and insecurity. Technological progress, capital formation, savings, and a stable political economy are fruits of a peaceful environment. Besides this, military expenditure is also high for countries running a risk of war. Increased military expenditure and reduced investment in infrastructure and education, which are more essential for long-run growth, are also affected by terrorism. Challenges of terrorism include poverty, low per capita income, income inequality, inflation, unemployment, political instability and low literacy rate, revealed by empirical studies (Ismail & Amjad, 2014).

Peaceful and terrorism-stricken environments are not included in any growth theories, such as endogenous and exogenous growth theories. These theories emphasised human capital growth, savings, technology, population, research and development, quality institutions, public infrastructure, and political stability. Nowadays, it has become an emerging issue for scholars to investigate the association between economic growth and terrorism (Barth et al., 2006; Bilgel & Karahasan, 2016; Gaibulloev et al., 2010). On the other hand, a stable political economy, democracy, high-quality institutions, and developed economies are indications of a peaceful environment (Kodila-Tedika, 2014; Öcal & Yildirim, 2010). As it is difficult for developing countries to increase their savings in the short run, economists prefer to borrow savings from other countries through loans, FDI, and portfolio investment. According to Harrod-Domer model, it is considered rational that developing countries should borrow savings from foreign countries, as developing countries lack capital stock and also face decreasing return to capital. Moreover, the flow of capital was from poor to rich countries (Gourinchas & Jeanne, 2013; Lucas, 1990).

FDI is considered an essential suggestion for developing countries by global organisations to enhance their growth. Prior studies (Balasubramanyam et al., 1996; Blomstrom et al., 1994; Blomström & Sjöholm, 1999) suggest that FDI is the primary source for transferring technology from one country to another. Similarly, based on endogenous growth theory, various authors have emphasised that adoption of technology and FDI plays a crucial role in the transfer of technology, as opposed to Solow-Swan's exogenous growth

theory (Barro, 1990; Lucas Jr, 1988; Romer, 1990).

Energy is considered crucial in economic progress and development all over the world. Besides, capital, saving and FDI. Toman and Jemelkova (2003) noted that developed economies are essential in improving energy resources. In fact, energy development is closely connected to hyperbolic provision and consumption of energy sources, although energy development is associated with an alternative factor of production. Rapu et al. (2015) referred to the world economic forum discussing that the energy sector not solely enhances sustainable development but also conjointly increases resource efficiency and employment opportunities. Energy is considered as life-blood in any economy for economic development. The economic process and development of any country principally rely on energy. The role of energy in economic development and growth is undeniable; furthermore, it generates employment opportunities and increases per capita income. Energy is in fact considered to be the lubricant of sustainable economic growth, as the services sector like household, transport, and industry mainly rely on energy (Rapu et al., 2015). Energy is considered a milestone for economic development. Consequently, with increased economic development, a demand for additional and higher quality energy services increases. Many countries have started to expand the circle of energy infrastructure. Low per capita income is mainly due to their less attention to energy development. Energy services also empower basic human needs such as food and shelter. Energy has many sectors, but electricity plays a significant role in human development and other social development, such as education and human health

Thus, this paper offers new insights by examining the influence of terrorism, FDI and energy consumption on economic growth in South Asian economies. Previous researchers such as Abosedra and Ghosh (2007) and Toman and Jemelkova (2003) have examined the nexus between energy consumption and economic growth. Likewise, other researchers (Denault, 2011; Sakyi et al., 2014) have investigated the relationship between FDI and economic growth. Furthermore, Blomberg and Hess (2006) and Khan et al. (2016) have examined the linkage between terrorism and economic growth. While Shahzad et al. (2016) and Zakaria et al. (2019) researched the relationship between terrorism, FDI and economic development, ignoring the energy consumption variable.

Due to the aforementioned limitations, the researchers in this study added the factor of terrorism as well as traditional economic variables, such as foreign direct investment (FDI), economic growth and energy consumption. Most of the growth models provide the theoretical linkages among the economic growth and stimulating factors such as FDI, human capital, physical capital etc. However, human capital and physical capital factors will be fruitful when the environment

is conducive and peaceful. Similarly, energy consumption and FDI would stimulate economic growth, subject to the absence of law-and-order issues. But no such growth models are available that explain the economic growth from the perspective of terrorism. Thus, this study examines the role of FDI and energy consumption in the economic growth of South Asian countries in the presence of terrorism.

LITERATURE REVIEW

Terrorism and Economic Growth

Terror and terrorism result in losing investors' confidence due to uncertainty, considerable loss in economies, and increased nonproductive expenditures, such as military expenditure (Bird et al., 2008). Besides this, terrorism also paralyses critical sectors of the economies. Consequently, terrorism achieves its goal by creating horror and fear within society. In other words, terrorism exerts pressure over the political authority and, through violence, usurps public interest (Karaduman & Batu, 2011). Mostly, terrorism directly destroys human and physical capital stock, including lives and property- damage, which reduces economic activity, whereas economic and market agents are affected indirectly by discouragement. It is suspected that specific sectors of the economy are affected by terrorism (Estrada et al., 2015).

As tourism expands in a peaceful environment only, terrorism, on the other hand, reduces national savings, investment and consumption. Furthermore, it leads to uncertainty, further to reduced long-term investment. It ultimately affects economic growth because terrorism reduces investment in education and infrastructure (Bird et al., 2008). Additionally, terrorism reduces trade and capital flow into the affected countries, as it possesses risk and a reduced rate of return on investment (Abadie & Gardeazabal, 2008).

Foreign investment and finance are considered key to economic growth for many economies. However, in terrorism, these economies directly lose international capital. As a result, it causes an adverse impact on economic development in the countries. Many empirical studies find that terrorism negatively affects public spending and investment on consumption and flow of goods and capital across the border (Abadie & Gardeazabal, 2008; Crain & Crain, 2006; Gaibullov & Sandler, 2008). Thus, because of these aforementioned negative impacts of terrorism, many empirical studies concluded that terrorism is unfavourable to economic growth (Gaibullov & Sandler, 2008, 2011; Tahir, 2018).

FDI and Economic Growth

Previous studies suggest that FDI contributes a significant portion to the development of the economy. In this context, the most similar study was done by [Denault \(2011\)](#), who considers that FDI is the most imperative feature along with foreign remittances and imports for better economic growth. The reason is that FDI removes financial constraints by enhancing the capital formation in the country and is also responsible for the diffusion of technology and expertise. FDI directly affects economic progress in developing countries ([Sakyi et al., 2014](#)).

Moreover, growth of a country's economy is boosted with the help of FDI. With the support of FDI, a country adopts more advanced technology, and domestic businesses improve rapidly ([Barro & Lee, 1993](#)). Previous researchers tested the relationship between economic growth and FDI. The results of these studies show that economic growth improves significantly with the help of FDI. ([Almfraji & Almsafir, 2014](#); [Jawaid & Raza, 2016](#); [Jawaid & Saleem, 2017](#)).

Similarly, [Iamsiraroj and Ulubaşoğlu \(2015\)](#) found that FDI has a robust association with economic growth in the case of Malaysia. [Balamurali and Bogahawatte \(2004\)](#) examined the causality between FDI and Economic growth and concluded that both factors affect each other. In contrast, studies performed by [Hermes and Lensink \(2003\)](#), [Li and Liu \(2005\)](#), and [Bashir et al. \(2014\)](#) have evaluated that FDI has a negative impact on economic growth. The positive and negative relationship between FDI and economic growth were contended by [Hermes and Lensink \(2003\)](#). They suggest this issue can be fixed with the support of the country's financial development. At the same time, [Bashir et al. \(2014\)](#) deduced that an unfriendly business environment, bad governance, and weak public policies are liable for the negative effect of FDI on economic growth.

Energy and Economic Growth

For better economic growth, energy acts as blood in a country's economic development. However, in empirical exploration, the impact of energy on economic growth is doubtful. On the one hand, the researchers have confirmed energy causes economic growth ([Abbasi & Abbasi, 2010](#); [Amin & Aatur, 2011](#); [Chiou-Wei et al., 2008](#)). On the other hand, some researchers presented that economic growth cause energy ([Joyeux & Ripple, 2011](#); [Lise & Van Montfort, 2005](#); [Mehrra, 2007](#)). Whereas previous researches concluded that energy and economic growth cause each other. ([Nondo et al., 2010](#); [Omotor, 2008](#)). In contrast, empirical studies such as [Abosedra and Ghosh \(2007\)](#) in the case of Pakistan [Sarkar et al. \(2010\)](#) in the case of Bangladesh did not find any causation.

in a study [Shahbaz et al. \(2018\)](#) analysed the dynamic link between energy and economic growth. They applied the quantile-on-quantile technique to estimate the dynamic relationship between economic growth and energy. Outcomes of the study revealed the weak impact of economic growth on energy in the lower quantiles in China, France, Germany and India. Thus, this finding highlights that energy has a low impact on economic growth. Similarly, results also showed a fragile influence of economic growth on energy for the highest income quantiles in Brazil, Canada, South Korea and the USA. Thus, they concluded that demand for energy declines with increased economic growth. Moreover, they claimed that these countries above utilise energy efficiently.

METHODOLOGY

This paper aims to estimate the impact of terrorism, energy consumption, and FDI on the economic growth of South Asian countries. Therefore, this study used panel data to estimate the specified model from 2002 to 2016. Panel data have both time series as well as cross-sectional dimensions. Moreover, we have selected 5 South Asian countries, i.e. Bangladesh, India, Nepal, Pakistan, Sri Lanka. These countries' data were available. However, the rest of the countries of South Asia data was not available, and as a result, they have been ignored. The data for the terrorism index was collected from the [GTD | Global Terrorism Database \(2018\)](#). While data for the education variable is proxy with human capital index from the [Penn World Table Data \(2018\)](#) (based on year of schooling returns to education). The rest of the variables data, such as energy consumption measured in a kilogram of oil equivalent, FDI and domestic investment measured as a ratio to GDP, and economic growth is proxy with per capita measured in constant USD, was taken from World Development Indicators (WDI).

The use of panel data is appropriate for carrying out cross-country studies, as mentioned in the literature of [Tahir and Azid \(2015\)](#). We have specifically designed Fixed and Random effects models to estimate panel data models. The choice concerning the fixed and random effects shall be made through the well-known Hausman specification test ([Hausman, 1978](#)). The Hausman test would suggest either picking fixed-effects or random-effects approaches in the present case. The test provided supports the fixed effects modeling over the random effects modeling. Therefore, fixed effects techniques were considered regarding the specified models. The model can be econometrically expressed as follows:

$$GGDP_{i,t} = \beta_0 + \beta_1 GTI_{i,t} + \beta_2 ENGC_{i,t} + \beta_3 FDI_{i,t} + U_{i,t} \quad (1)$$

In Equation (1), the dependent variable is real growth in GDP per capita, used as an indicator of economic growth. The independent variables include the global terrorism index, energy consumption and FDI. Besides the mentioned variables, we have included domestic investment and education as control variables in model 1. After the incorporation of domestic investment and education into Equation 1, the following econometric regressions form:

$$GGDP_{i,t} = \beta_0 + \beta_1 GTI_{i,t} + \beta_2 ENGC_{i,t} + \beta_3 FDI_{i,t} + \beta_4 INV_{i,t} + \beta_5 EDU_{i,t} + U_{i,t} \quad (2)$$

In Equation (2), domestic investment and education are included as control variables.

FINDINGS AND DISCUSSION

Table 1 stipulated the results of the descriptive statistics. According to the results presented, average economic growth for the South Asian countries is recorded to be 4.011 per cent during the study period with maximum and minimum values of 9.002 and -1.412 per cent, respectively. These values indicate that the South Asian region enjoys moderate economic growth compared to other developing countries such as the Sub-Saharan African region. The mean value of the global terrorism index is 6.182, with maximum and minimum values of 8.931 and 3.588. The standard deviation of the terrorism index is relatively tiny, showing consistent incidents of terrorism in the South Asian region over the years. We have used an index for education, and the average value of education for the South Asian countries is 1.986. Similarly, energy consumption on average for the study period is recorded as 404.320, with a maximum value of 636.571 and a minimum of 154.392. The standard deviation for the energy consumption indicated a marginal deviation from the mean, implying that all countries in the region are using considerable energy.

Table 1.
Descriptive statistics

	Descriptive Statistics					
	GDP	GTI	Educ	Energy	FDI	Inv
Mean	4.011	6.182	1.986	404.320	1.127	24.081
Median	4.165	6.116	1.811	449.578	1.037	24.721
Maximum	9.002	8.931	2.899	636.571	3.668	35.812
Minimum	-1.412	3.588	1.406	154.392	-0.098	12.520
Std. Dev.	2.122	1.467	0.476	125.197	0.847	6.077

Table 2.
Correlation statistics

	Correlation statistics					
	GDP	GTI	Educ	FDI	Energy	
GDP	1					
GTI	-0.260	1				
Educ	0.416	-0.120	1			
FDI	0.122	0.312	0.298	1		
Energy	0.086	0.594	0.352	0.394	1	
Inv	0.590	-0.182	0.204	0.273	0.041	1

Note: Authors own calculation using Eviews-9

Table 3.
The fixed effect model estimation results

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Constant	-37.622 (22.153)	- 14.218 (4.623)	-2.885 (12.868)	-14.762 (13.220)	-17.49 1 (50.848)	-56.798 (19.957)	19.598 (29.262)	-34.573 (15.037)
GTI	-1.671 (1.433)	-1.841* (1.115)	-1.841 *** (0.600)	-0.726 (1.215)	-5.527 (27.220)	2.323 (2.306)	- 29.359 ** (14.029)	-1.748 (1.539)
Energy	7.623** (3.577)	1.261* (0.689)	-2.912 (3.983)	-3.521 (2.957)	-2.185 (9.495)	2.537 (2.967)	0.243 (3.802)	0.141 (3.530)
FDI	-0.573 (0.613)	-0.048 (0.281)	-0.059 (0.470)	-0.557 (0.344)	-0.711 * (0.435)	3.592 (3.264)	- 0.995* (0.522)	2.223* (1.166)
Inv		4.479*** (0.851)		7.030*** (1.162)	7.105* (3.797)	7.277** (3.546)	- 10.114 (9.871)	7.550* (3.934)
Educ			10.973* (6.629)	9.812*** (3.201)	6.497 (6.374)	9.834* (5.353)	7.889 (7.153)	5.740 (6.614)
GTI × Energy					0.927 (4.567)			
GTI × FDI						-2.360 (1.835)		
GTI × Inv							9.403** (4.581)	

Continued on next page

Table 3 continued

GTI × Energy × FDI × Inv									-0.076* (0.038)
Diagnostic tests									
R ²	0.641	0.487	0.479	0.509	0.498	0.674	0.529	0.514	
F-test (overall)	4.244*** (0.000)	6.660*** (0.000)	6.451*** (0.000)	6.348*** (0.000)	5.368*** (0.000)	3.958*** (0.000)	6.076* (0.000)	5.726*** (0.000)	

Note: *, ** and *** represent significant level at 1, 5 and 10%

The region did not do well in terms of FDI, and net inflows are appeared to be slightly above one per cent. Lastly, the region did well in terms of domestic investment as it appears to be positive. The standard deviation of investment showed that the region has marginal investment deviations, implying that all countries are investing significantly in their domestic economies.

Correlation analysis is considered an essential exercise before the regression models. A higher correlation between the variables leads to the problem of multicollinearity. Correlation between the variables is given in Table 2. Results of the correlation have rejected the presence of a perfect correlation between the variables, which is desirable. Education and GDP per capita are strongly correlated with each other.

Similarly, energy consumption also strongly correlates with GDP per capita. Moreover, all other variables are moderately related to each other. In most cases, macroeconomic factors influence each other in one manner or the other. In this part of the paper, we have mainly discussed the analysis results. The estimated results for identified models of the study and augmented models that include interactive terms based on the fixed effects estimation procedure are presented in Table 3. The outcome of the analysis indicates that terrorism has a negative impact on the economic growth of South Asian countries. The findings concerning the influence of terrorism and economic growth are in line with [Bayar and Gavriltea \(2018\)](#). It implies that the problem of terrorism can be blamed for the poor economic growth of the sampled countries. Terrorism is undesirable and brings multiple adverse consequences for the host economy. Therefore, targeted and timely actions are obligatory on the part of policymakers of the South Asian countries to alleviate the problem of terrorism.

Moreover, it is advised that these countries should cooperate sincerely in this regard. Consequently, the absence of terrorism would put them on the right track of economic growth and help them get rid of various socio-economic problems. All this will be possible by utilising the flat form of the South Asian

Association for regional countries (SAARC).

The outcome revealed that energy consumption and economic growth have a positive and significant relationship. Similar results were identified by [Gozgor et al. \(2018\)](#) for OECD countries. Energy consumption can positively influence countries' economic growth due to massive production and exports. The availability of cheaper energy sources, particularly for the export-oriented industries, shall be ensured. The literature well understood that export matters the most from economic growth. It is a common observation that developing countries like those located in South Asia face severe energy crises. Therefore, the developing countries in general, and those located in the South Asian region, are strongly directed to invest in the energy sector to grow their economies in the long run.

The outcome presented that FDI and economic growth has a negative association. It has been mentioned in the literature review that FDI is the engine of economic growth. This association can be explained two-fold. Possibly it is the one aspect that these nations do not acquire FDI. However, it is also logical to think that the absorptive capacity of the sampled countries is not enough to grab the benefits of FDI. Domestic absorptive capacity is required to reap the full benefits of FDI. The results related to the impact of FDI on economic growth are in line with those of [Bermejo and Werner \(2018\)](#). They further documented that the positive effect of FDI on economic growth could be realised in advanced economies having an educated workforce. The South Asian economies are suggested to invest heavily in the domestic economy, specifically to improve the ordinary labour force's skills and grab the benefits associated with FDI. The Labour force is primarily unskilled in developing countries, like those in the South Asian region. Hence, this could be one of the possible reasons behind the negative relationship between FDI and economic growth.

In columns three to four, we have presented results after controlling for domestic investment and education, respectively. According to the results obtained, it is found that after controlling for domestic investment and education, the relationship between terrorism, energy consumption, FDI, and economic growth did not alter. Domestic investment is positively related to economic growth, and domestic investment is a key to growth, especially in the theoretical and empirical literature. Moreover, it is also witnessed from the results that education, also known as human capital, has positively impacted economic growth. However, again this relationship is also insignificant statistically.

Lastly, it is worth mentioning that the explanatory power of the estimated models is reasonably good, and the value of R-Squared is more than 40 per cent for all the models. Similarly, the F-Test and its associated probabilities have

confirmed the overall fitness of the estimated models (see Table 3).

CONCLUSION

Economic growth models mainly provide the theoretical linkages between economic growth and stimulating factors such as FDI, human capital, physical capital etc. However, human capital and natural capital factors will be fruitful when the environment is conducive and peaceful. Similarly, energy consumption and FDI would stimulate economic growth, subject to the absence of law-and-order issues. But no such growth models are available that explain the economic growth from the perspective of terrorism. Hence, this research study was designed to analyse the role of energy consumption and FDI for the better economic development of South Asian countries in the presence of terrorism as these countries are affected by terrorism. This study employed appropriate panel data techniques to estimate models and utilised data for 2002-2020. The results indicated a significant negative relationship between terrorism and economic growth for the sampled countries. Terrorism is indeed undesirable and hence must be eradicated, and especially South Asian nations can help each other from the platform of SAARC to control terrorism. They should share intelligence information and experiences sincerely regarding terrorism. They should help each other tackle social problems such as poverty and inequality from the platform of SAARC that may lead to terrorism. Each member of SAARC must consider terrorism as a problem of not an individual member but of the region as alleviation of terrorism needs joint efforts. We found that energy consumption appeared to be promoting economic growth. Energy consumption can enhance economic growth through increased production and hence high exports.

On the other hand, we could not find any positive impact of FDI on economic growth. Multiple factors, such as poor labour force skills, poor institutions, and trade restrictions, can explain the negative but statistically insignificant impact of FDI on economic growth. Lastly, we found that although human capital and domestic investment have positively impacted the economy but statistically insignificantly. Based on the findings, the policymakers of the South Asian countries are advised to control terrorism, invest in energy, and develop labour force skills to grow their economies fast. Most importantly, to improve the security situation and make the region free from terrorism, these countries must cooperate sincerely and share information in this regard. All this will be possible by utilising the platform of SAARC.

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