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Impact of Radical Terrorism on Foerign Direct Investment and Economic Growth in Somalia: Evidence from Auto Regressive Distributive Lag (ARDL) Specification

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ABSTRACT

One of the main three factors driving most of the challenges in Somalia are terrorist groups holding swathes of land in the most productive parts of the country, crippling local production, major supply routes and limiting the movement of people and goods and lagging economic growth which is impeding the provision of essential services to the public. Therefore, this paper investigates the relationship between terrorism, foreign direct investment and economic growth in Somalia from the time Al-Shabaab came into existence (2006) up to 2024 using Auto Regressive Distributive Lag (ARDL). The Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) unit root tests were carried out on all variables to ascertain their stationarity in which mixed order of integration was found. The ARDL result showed that terrorism negatively affects economic growth. This implies that when terrorism increase economic growth reduces. Thus, the study concluded that freeing Somalia from the cruelty of terrorism is not only the key to achieving sustainable peace in the country but also a necessity for building a modern state capable of providing much needed services to the public and eventual sustainable economic growth and prosperity.

Keywords: Terrorism; Economic growth Auto Regressive Distributive Lag (ARDL).

INTRODUCTION

Terrorism has become a major problem faced by a huge bulk of countries over the globe (Laqueur, 2017). Economists Enders & Sandler (2011) define terrorism as the risk of utilizing savagery by subnational gatherings or a person to achieve a political or social goal by terrorizing a huge group of spectators past that of the prompt exploited people. Kiliç (2007) also argues that Terrorist activities represent severe threats to all countries. The term "terrorism" originates from the Latin word "terrere." In French, "terreur" translates to "terrorism," which is rendered as "terror" in English. It literally means to instill fear, terrorize, and intimidate individuals and societies. But given that terrorism is influenced by various factors, there is no universally accepted definition. The concept of terrorism is generally perceived as broad and vague, making it challenging to define due to its evolving nature and diverse objectives. Therefore, it is understandable that terrorist activities lack an objective definition, unlike other crimes involving force and violence (Topal, 2004). According to the Global Terrorism Index (2019), terrorism involves the use of illegal force by non-state actors within countries to achieve their goals through fear and oppression.

Globally, deaths from terrorism increased by 22 percent to 8,352 deaths and are now at their highest level since 2017, although they remain 23 percent lower than at their peak in 2015, deaths would have still been up by five percent. While the number of deaths increased, the number of incidents fell, with total attacks dropping by 22 percent to 3,350 in 2023. Pakistan recorded the most incidents of any country, with 490 attacks recorded (GTI 2022). The rise in deaths but fall in the number of incidents shows how terrorism is becoming more concentrated and more lethal. The number of countries recording a death from terrorism fell to 41, considerably lower than the peak of 57 countries recorded in 2015 and 44 recorded in 2022 (OCHA 2023).

In Africa, the Global Terrorism Index (GTI 2023), argues that the epicenter of terrorism has now conclusively

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shifted out of the Middle East and into the Central Sahel region of sub-Saharan Africa. Sub-Saharan Africa recorded the most deaths of any region for the seventh consecutive year, with an increase of 21 percent compared to 2022. Burkina Faso, Mali, and Niger account for most of the terrorism deaths in the region. All three face uncertain futures, having suffered from coups, weak governance, and fragile relations with neighboring countries, exemplified by their recent withdrawal from ECOWAS, (African Development Bank, 2023). In East and Western Africa, al-Shabaab and Boko Haram are respectively the most dangerous. Due to al-Shabaab's activities of atrocities, East Africa is known to have extremely high levels of terrorism incidents in the region, (Ahmed, A., et al. 2020). Now, three major causes make the Sub-Saharan Countries more vulnerable to terrorist attacks, firstly; conflicts, coups, and ethnic tensions. Secondly, it is about the proliferation of arms and light weapons, poverty, and mass youth unemployment which made them vulnerable to the grasp the extremist thoughts thirdly, it is about the issue of Muslim-Christian conflict in other words religious fundamentalism and that gave the terrorist groups to spread their lies that Muslims and Christians cannot and should not coexist, cooperate or even share the basic elements of life, (Mohamed, Schmitt & Ibrahim 2017).

At this crucial juncture of Somalia's revival story, the country still faces complex challenges driven by terrorism. The presence of a destabilizing terrorist group, Al-Shabaab, has not only crippled the productive sector but also disrupted supply chain routes and the movement of people and goods by holding the most productive central parts of the country, jeopardized the investment calculations of both domestic and foreign enterprises, state finances were also affected in the bid to curb terrorist activity with potential spill-over consequences for social and welfare spending (World Bank, 2022).

Al-Shabaab a radical militant group first emerged in a battle over Somalia's capital in the summer of 2006. As an Al Qaeda affiliate based in Somalia and Kenya, it pursues Islamist statehood aspirations in Somalia. Al-Shabaab was estimated to have between 7,000 and 9,000 fighters in 2019. It gained global recognition following several deadly attacks concentrated around the capital city of Mogadishu, as well as attacks in the neighboring states of Kenya, Ethiopia, and Uganda in the 2000s (Ali, 2023). African Union peacekeeping forces known as the African Union Mission to Somalia (AMISOM) which later on being replaced by the African Union Transition Mission in Somalia (ATMIS) in April 2022, have been fighting al-Shabaab since 2007 with the help of US and United Nations (UN) support.

After securing the HIPC completion point, the Somali government announced in August 2022 a renewed offensive scheme against Al-Shabaab. The operation has made significant progress in recapturing territory held by Al-Shabaab for a decade or more, and despite the fact that Al Shabaab was debilitated in the period 2022-2023, it is too early to celebrate its defeat unless urgent measures are put in place to tackle governance, economic and political problems that are central to the cause of the conflict, (Somalia State of The Economy Report, 2023). And this will not be an easy task since for the ninth consecutive year al-Shabaab is still the world's fourth deadliest terrorist group in 2023, with 227 attacks and 499 deaths being attributed to the group in 2023, (Global Terrorism Database 2023).

In Somalia, the economic growth is mostly driven by the agriculture and services sectors. Agriculture accounted for over 60 percent of GDP over the last decade (2011-2022), making it the largest contributor to the country's growth. Livestock accounts for about 40 percent of GDP. Inflation reached 6.8 percent in 2022 from its low level of 4.6 percent in 2021. The increase in prices was primarily due to the decline in agricultural production, driven by drought, flooding, and fragile security conditions. Somalia's trade balance was 64.1 percent of its GDP, but it rose to 70.3 percent in 2022. Unfortunately, there has been a decrease in exports due to drought and insecurity caused by frequent attacks from Al Shabaab and the war in Ukraine (Federal Government of Somalia, 2022).

The domestic economy of Somalia is expected to improve in 2023 and 2024. In particular, the country's real GDP growth rate is estimated to increase to 2.8 percent in 2023 up from 2.4 percent in 2022. This represents a slight decrease from the previous projection of 3.1 percent for 2023 which was published in the December 2023 National Economic Council report, as the impact of drought and lower remittances pose substantial risk. The slower growth in 2022 is also largely due to the drought conditions and reduced remittance inflows, but it

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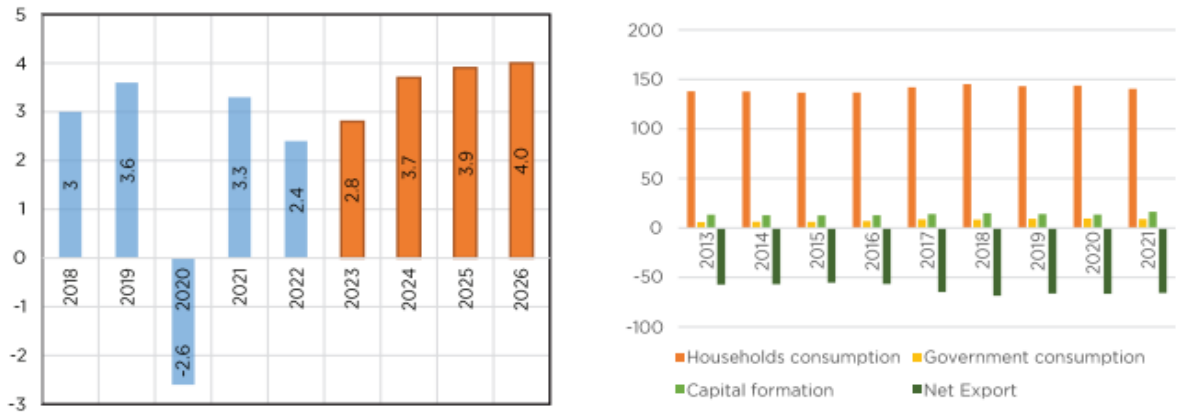
is expected to pick up with a projected growth of 2.8 percent and 3.7 percent in 2023 and 2024 respectively (IMF 2023).

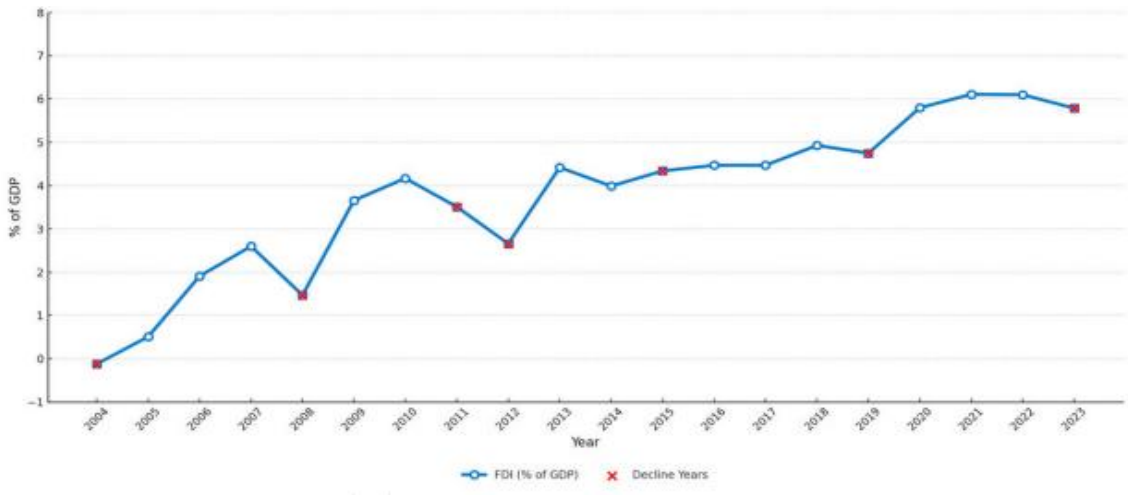
Figure 1: Somalia GDP Growth Rate and annual share of GDP Expenditure



Based on the above two figure's data from the National Bureau of Statistics (SNBS 2023), GDP components by expenditure as a share of GDP remained relatively stable in the last decade. During this period, household consumption expenditures remained, on average, 140 percent of GDP. During this period, Gross capital formation accounted for a relatively minor share of GDP, averaging 14 percent annually, although it increased by more than 3 percent for the last year. The share of exports of goods and services averaged 19 percent of GDP, a reasonably low rate during the nine years that ended 2021, while imports of goods and services averaged 81 percent of GDP annually, resulting in large trade deficits of 62 percent annually. And for this reason, the past decade has not seen considerable economic growth to contribute to reducing poverty.

On the other hand, Foreign Direct Investment (FDI) in Somalia remained relatively stagnant, with an average of 7.8%. External grants finance roughly makes a half of the budget, with the World Bank providing around 82 percent of total grants in 2022 but they are expected to decline significantly after the HIPC Completion Point (National Economic Council, 2023). The biggest reason that is causing FDI of Somalia to remain stagnant can be affirmed that terrorist activities instigate uncertainty within the country, affecting not only the investment decisions of domestic firms but also dissuading potential investments from foreign entities. Particularly in regions plagued by terrorism (Southern regions), firms refrain from initiating new investments due to heightened uncertainties. An escalation in terrorist acts within these regions results in diminished investments and an uptick in public expenditures. The following figure illustrates the developments in net FDI inflows in Somalia over two decades which shows fluctuating and stagnant trend.

Figure 2: Foreign Direct Investment, Net Inflows (% of GDP), 2004-2023



Source: Based on Data from the OIC and World Bank (2024)

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The average net inflow of foreign direct investment (FDI) as a percentage of GDP during the period (2004-2023) as depicted in figure 2, was 3.8%, with a coefficient of variation of 47%. The net FDI inflow transitioned from a negative rate in 2004 to a positive rate in 2005, with subsequent increases in net inflows before declining in 2008 due to the global financial crisis. FDI net inflows recovered in 2009 and 2010, then declined in 2011 and 2012 due to terrorist attacks on the World Trade Center. FDI net inflows increased significantly since 2015, driven by Somalia's Foreign Investment Law and its accompanying incentives, resulting in an average net FDI inflow rate of 5.2% of GDP during the period (2015-2023). These results show that global events and the investment environment in the country both shape FDI inflows. Notably, consecutive droughts over the last four years of the analysis did not influence FDI in Somalia, since most foreign investments focus on infrastructure. The estimated average compound annual growth rate of net FDI inflows as a percentage of GDP was 4% during the period (2004-2023).

Nevertheless; against all the challenges this country has been facing over the last thirty years of state fragmentation, terrorism plays a key factor, imagine for the third and fourth quarters of 2023 and the first quarter of 2024 alone, the Financial Reporting Center under Article 21 sub-article 3 of AML/CFT Act has frozen over 250 bank accounts suspected to be linked to terrorism financing entities and individuals (National Bureau of Statistics, 2023). Additionally, as the Somali National News Agency (SONNA, 2023) narrates Al-Shabaab collects as much as $120 million annually either in monthly payments or a yearly “Zakat,” which is 2.5% of their annual profits.

Consequently, this study examines the impact of terrorism on foreign direct investment and economic growth of the Somalia from 2006 up to 2024. The outline of the paper is presented as follows: following the introduction Section 1, Section 2 provides a review of existing literature. Section 3 focuses on the theoretical framework and methodology adopted for the study. Section 4 dwells on the empirical analysis and discussion of results, Section 5 concludes the paper, while section 6 presents recommendations.

REVIEW OF LITERATURE

The empirical literature on the relationship between terrorism FDI and economic growth also turns out to be giving us the same conclusion that it deteriorates growth and investment.

Mathiyalagan & Padli (2022), aimed to investigate the impacts of terrorism on economic growth (GDP) and foreign direct investment (FDI) in Developing Asian Countries: Malaysia, Indonesia, and the Philippines. The panel data was collected from World Bank Data Malaysia and the Department of Statistics Malaysia from 1999 to 2016 for each selected country. This study uses the panel data regressions to analyze the data by using the Pooled Ordinary Least Square (POLS), Fixed Effect (FE), and Random Effect (RE). This study showed that gross domestic product and foreign direct investment have a negative relationship with terrorism in Malaysia, Indonesia, and the Philippines.

Yusuf. Ü & İ. Çinar (2022), examines the relationship between terrorism and economic growth for a panel of fifteen Middle Eastern countries for the 2003-2019 period. Panel data analysis has the advantage of providing more information, more variability, and less collinearity in the data compared to single-country time series analysis. Besides this advantage, most of the cross-country panel data studies in the terrorism and economic growth literature assume that terrorist activities are homogeneous across countries. They also used the Dumitrescu-Hurlin panel causality test accounting for cross-sectional heterogeneity, which is widely ignored in most panel data studies on terrorism and economic growth nexus. Dumitrescu-Hurlin causality test results reveal in favor of a Uni-directional negative causal relationship between terrorism and economic growth in the Middle East for the overall panel.

Alade (2021), examined the impact of terrorism on economic growth and human capital development in Nigeria from 1981-2019. The Generalized Method of Moments (GMM) estimator was employed in analyzing the data. A negative and insignificant impact of terrorism on economic growth and human capital development was found. Internal and external conflict also had a negative and insignificant impact on economic growth and human capital development.

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Muhammad. A et al. (2020), The main objective of this study was to empirically examine the relationship between domestic terrorism, investment, and economic growth. The study found the implication of domestic terrorism on investment and growth among 26 Muslim and 14 Christian developing countries for the period 1990-2015. Ordinary Least Squares (OLS), feasible generalized least squares (FGLS), and system generalized method of moment (SGMM) approaches were applied to ensure robust results with different specifications of models by using dummy variables. The value of the Dummy variable is 1, if the country is Muslim otherwise 0. For all specifications, it is confirmed that an increase in domestic terrorism will decrease the level of investment directly and hence economic growth.

Muhammad. Z. (2019), examined the impact of terrorism on economic growth in Pakistan. Channel variables, such as foreign direct investment (FDI), domestic investment, and government spending, through which terrorism influences economic growth, are identified. For empirical analysis, annual data for the period 1972-2014 were used, and a structural model was estimated using the generalized method of moments (GMM) estimation approach. The results reveal that (1) the impact of terrorism on FDI and domestic investment is significantly negative, whereas the impact on government spending is significantly positive and (2) the net effect of terrorism on economic growth is negative. One percent increase in terrorism reduces FDI by 0.104 percent, domestic investment by 0.039 percent, and economic growth by 0.002 percent. To increase economic growth more resources must be allocated to improve law and order. To attract foreign investment, complementary domestic investment must be increased.

Maria (2020), used the data set from 1981 to 2016, their analysis was carried out to extract the influence of terrorism on economic growth in Pakistan, incorporating trade, foreign aid, and capital for 35 years. This study applied ARDL bounds testing to inquire into the problem and found a co-integration nexus among the used macroeconomic indicators. The evidence shows that terrorism has an inverse relationship with economic growth which was statistically significant.

Siddique, Liaqat & Ullah (2017), examined the effect of terrorism on domestic investment as well as foreign direct investment in Pakistan. The study covered the 1980-2015 sample periods. The autoregressive distributed lag-bound testing co-integration approach was employed. The study found a long-run relationship between terrorism and investment. A negative effect of terrorism on both domestic and foreign investments was also found.

Cinar, M. (2017), examined the effects of terrorism on economic growth experienced worldwide. More precisely these terrorist incidents and their effects on economic growth in most countries are classified according to income groups. In this respect, they conducted a panel study (FE and RE models) to analyze the number of terrorist incidents in these countries, and the data ranged from 2000 to 2015 covering a total of 115 countries. The result of the study was in line with other findings in the literature. It was found that those terrorist attacks were hurting the economic growth in most countries, particularly in low-income countries. Generally speaking, the findings showed that low-income countries are affected about three times more than high-income countries as a result of these terrorist attacks.

From the foregone empirical studies, it is evident that the literature on terrorism and economic growth is replete with divergent results. Divergence observed in these results suggests differences in theoretical and methodological approaches employed and the different contexts studied. The kind of relationship between terrorism and economic growth in the Somali context is subject to empirical investigation, such inquiry is what this study is set to achieve and to find out if this study will corroborate any of the above outcomes.

Theoretical Framework

Terrorism often leads to the collapse of education infrastructure, worsening school results; and low enrollment rates, and all have the inverse impact on economic growth. Terrorism also destroys the human capital of a country. It limits trade and foreign direct investment that restrain economic growth. Terrorism demolishes human capital worsening the education standards, low rates of enrollment, effects the productivity of labor. “Falling investor confidence may trigger a generalized drop in an asset price and a flight to quality that increases the borrowing costs for riskier borrowers (IMF, 2021). These indicators have an adverse impact on

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economic growth through terrorism. Capital assembling, by enhancing the productivity of the labor, plays an indispensable role in economic growth. Hence, capital accumulation by enlarging the scale of production and specialization increases the production and productivity in the economy and thereby promotes economic growth.

Therefore, the starting point is the traditional production function which may be written as follows:

$$Y_t = f(K_t L_t)$$

…… *(1)*

Where Y_t is the growth rate of real *GDP*, K_t is capital stock, L_t is labor, and t is time.

But as evident from our related studies, the effects of terrorism on growth are also discussed in the literature (Mathiyalagan. Y, 2022; Yusuf. Ü & İ. Çinar, 2022; Oluwaseun B. 2021; Siddique, Liaqat & Ullah, 2017).

$Y_t = f\ (K_t,\ L_t,\ Ter_t)$ ……... *(2)*

However, as emphasized by Ayadi & Ayadi, (2015) and Elbadawi, (1996), there are other factors associated with economic growth such as education, fiscal and monetary policy, exchange rate inflation, foreign direct investment, population growth, and among others. Therefore, in this study the following variables are included in the specified functional form of the model; Trade, which serves as a crucial part of economic growth. It helps to achieve efficiency in the allocation of resources through exports, which enhances economic growth (see, for instance, Siddique et al., 2018; Siddique and Majeed, 2015). Foreign Direct Investment (FDI) brings with it employment opportunities, knowledge, skills, and technology, all of which enhance economic development (Alenezi, A., 2020, Brimble, P., & Sherman, J., 1999).

$Y_t = f\ (K_t, L_t, Ter_t, FDI_t)$ …… *(3)*

By converting Eq. 3 into Cobb Douglas form:

$Y_t = f\ (K_t^{\alpha 1}, L_t^{\alpha 2}, Ter_t^{\alpha 3}, FDI_t^{\alpha 5})$ …… *(4)*

To linearize the equation, the natural logarithm can be taken as:

$ln(Y_t) = \alpha_1 ln(K_t) + \alpha_2 ln(L_t) + \alpha_3 ln(Ter_t) + \alpha_5 ln(FDI_t) + \varepsilon_t$ …… *(5)*

In this given model *Y* is the growth rate of real *GDP* is the dependent variable; while Capital (K), Labor (L), Terrorism (Ter), and foreign Direct Investment (FDI) are independent variables. All variables are used with natural logarithm (ln), and α shows elasticity of economic growth.

METHODOLOGY

To establish the linkage between terrorism and economic growth, the ARDL approach is utilized to establish long-run dynamics between the variables. But before applying the ARDL approach, firstly, a unit root test is employed to ensure the integration order.

Unit root test

Before proceeding with co-integration, the initial part is to determine the integration order of the variables used in the study. So, firstly, the ADF test is used which was originated by Dickey and Fuller in (1970, 1981) to undertake the problem of autocorrelation.

$$\Delta Y_t = \alpha + \gamma Y_{t-1} + \delta_t + \varepsilon_t$$

…… *(6)*

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In the Augmented Dickey Fuller test, reject of null hypothesis in case of larger value than critical and take the alternative, which means variables are integrated of order I(0). The hypothesis is accepted if the statistical value is not greater than the critical value which means series of variables is not stationary at the level. The first difference of the variables is taken to make the series stationary. Additionally, the model's statistical reliability is rigorously vetted through a battery of diagnostic tests; the Jarque-Bera test to check for normality of residuals; the Breusch-Godfrey test for autocorrelation; the ARCH test for heteroscedasticity; and the Ramsey RESET test for model specification.

In what follows, Johansen's cointegration procedure (1990) is adopted for this study because it involves the use of well-established, likelihood ratio statistics. Cointegration is a test for equilibrium between non-stationary variables integrated of the same order. The cointegrating equation is specified as:

$$y_t = \alpha + A_1 y_{t-1} + ... + A_\rho y_{t-\rho} + \varepsilon_t$$

……*(7)*

Where Y_t is k-dimensional vector of non-stationary variables, and ε_t is a vector of white noise residuals. By using the first difference operator Δ equation (8) can be rewritten as:

$$\Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{p} T_i \Delta_{t-i} + \varepsilon_t$$

…… *(8)*

The rank of the matrix Π determines the number of linear combinations of Y_t that are stationary processes. If the rank of the matrix is r, Π can be factored as $\alpha\beta'$, where the elements of α are the adjustment parameters in the error-correction model, and β contains the cointegrating vectors. Johansen derives two test statistics for testing the cointegrating rank. The first is the maximum eigenvalue test while the second is the trace statistic. If the variables in equation (7) turn out to be cointegrated, then the study will employ ARDL bound testing for co-integration and substitute to the co-integration model for Engle-Granger (1987). The study adopted the Autoregressive Distributive Lag (ARDL) approach due to its versatility in handling variables of different integration order, I(0) or I(1), without necessitating them to be of the same order, thus allowing for a more flexible analysis of the long-run and short-run dynamics simultaneously, Pesaran & Shin (1999) and Pesaran et al. (2001). This choice is particularly pertinent given the variables demonstrated stationarity levels. The study also employed Granger Causality Test to ascertain the direction of causality between the variables used for the study.

The ARDL model, as employed within this study, provides a nuanced framework for examining the cointegration relationship between terrorism and economic growth and is concisely encapsulated by equation 9.

$$\Delta \ln(Y_t) = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \Delta \ln(K_t)_{t-1} + \sum_{i=0}^{p} \alpha_2 \Delta \ln(L_t)_{t-1} + \sum_{i=0}^{p} \alpha_3 \Delta \ln(Ter_t)_{t-1} + \sum_{i=1}^{p} \alpha_5 \Delta \ln(FDI_t)_{t-1} + Y_1 \ln(K_t)_{t-1} + Y_2 \ln(L_t)_{t-1} + Y_3 \ln(Ter_t)_{t-1} + Y_5 \ln(FDI_t)_{t-1} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (9)$$

From the above equation, Δ is the first deviation operator, ΔK refers to the natural log of Capital formation, ΔL refers to the natural log of Labor, ΔTer refers to the natural log of terrorism, and ΔFDI refers the natural log of Foreign Direct Investment. α_1, α_2 …… α_5 show the short-term variation of the model while parameters Y_1, Y_2 …… Y_5 represents the long-term connection. The null hypothesis is:

H_0: $Y_1 = Y_2 = Y_3 = Y_4 = Y_5 = 0$

H_1: $Y_1 \neq Y_2 \neq Y_3 \neq Y_4 \neq Y_5 \neq 0$

Refusal of the null hypothesis (H_0) will support the presence of cointegration. If there exists co-integration in the model then the long-term connection would be estimated by the following equation:

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$$\ln(Y_t) = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \ln(K_t)_{t-1} + \sum_{i=0}^{p} \alpha_2 \ln(L_t)_{t-1} + \sum_{i=0}^{p} \alpha_3 \ln(Ter_t)_{t-1} + \sum_{i=1}^{p} \alpha_5 \ln(FDI_t)_{t-1} + \varepsilon_t \quad \text{.......} (10)$$

Variables, Proxy, Measurement and Source

Variables	**Proxy**	**Measurement**	**Source**
Gross Domestic Product	GDP	Annual growth percentages	World development indicators
Capital	K	Percent	UN-data
Labor	L	Percent	UN-data
Foreign Direct Investment	FDI	Net inflows (% GDP)	World development indicators
Terrorism	Ter	Global Terrorism Index Score	Global terrorism database

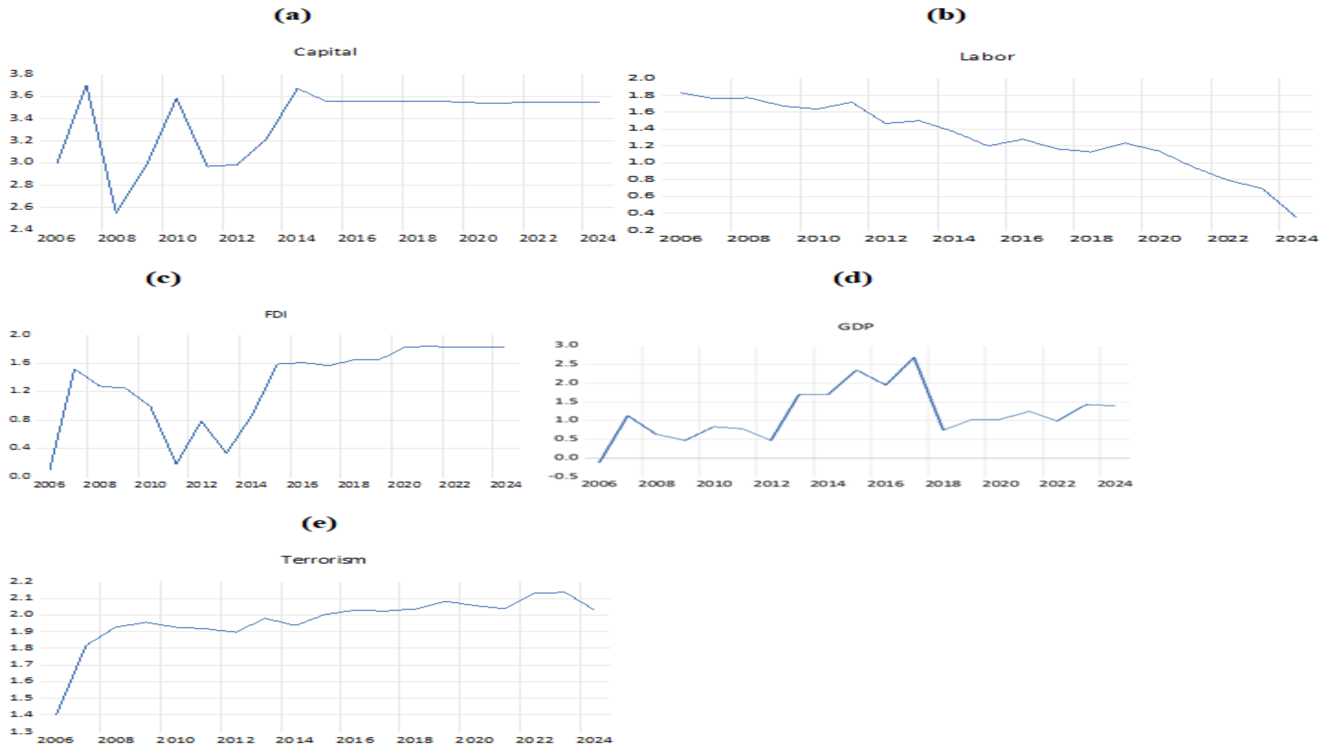

Figure 3. Trend of variables: (a) Capital; (b) Labor; (c) FDI; (d) GDP; (e) Terrorism

Empirical Results & Discussion

Preliminary Analysis

Table 1: Descriptive Summary

	lnGDP	**lnK**	**LnL**	**lnFDI**	**lnTer**
Mean	3.368	30.616	3.929	4.152	7.201
Median	2.700	34.800	3.590	4.800	7.410
Maximum	14.700	40.690	6.220	6.300	8.463

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Minimum	-3.800	12.820	1.430	1.100	4.070
Std. Dev.	4.129	8.183	1.422	1.837	0.960
Skewness	1.003	-0.857	0.062	-0.399	-1.759
Kurtosis	4.722	2.309	1.913	1.767	7.085
Jarque-Bera	5.537	2.706	0.946	1.708	23.024
Probability	0.062	0.258	0.622	0.425	0.000
Observations	19	19	19	19	19

Source: Author Computation

Table 1 presents a comparison of the key statistics for the study variables: Gross Domestic Product (GDP), Capital, Labor, Foreign Direct Investment (FDI), Terrorism. GDP show a mean of 3.368 and positive skewness (1.003) and a kurtosis of 4.22, which indicates a left-skewed distribution with some heavier tails. Capital shows a much higher mean of 30.616 with a negative skewness and kurtosis of 2.309 which suggests a more symmetric and flatter distribution. Labor displays a mean of 3.929 and a slight positive skewness of 0.062 and kurtosis of 1.913. FDI shows a mean of 4.152 with a moderate negative skewness (-0.399) and a kurtosis of 1.167, this reveals a mildly left-skewed distribution. Terrorism shows a mean of 7.201 with a negative skewness of -1.759 and a higher kurtosis of 7.085, indicating a sharply left-skewed and peaked distribution.

Stationarity analysis

Table 2 presents the unit root test results for the study variables using both the ADF and PP methods, tested at both levels (I(0)) and first differences (I(1)). Gross Domestic Product (GDP) is non-stationary at I(0), but both ADF and PP tests show strong significance at I(1), indicating stationarity after differencing. Capital (K) shows mixed results; while the ADF test becomes significant at I(1) with a constant, the PP test is not stationary. Moreover, labor is non-stationary at both ADF and PP I(0) but achieves stationarity at first difference I(1). FDI is not stationary at both ADF and PP I(0) but shows stationary at I(1) at first difference. For terrorism, it also shows mixed results with ADF test demonstrating non stationary, while PP tests confirm stationarity at I(1). Given this mixed order of integration, the ARDL method is the most appropriate model for the data, as it is designed to handle variables integrated at different levels.

Table 2: Unit Root Test

	Levels		**First difference**	
Variable	**ADF (Intercept)**	**PP**	**ADF**	**PP**
lnK	-1.526* (Intercept) -1.505* (Trend)	-3.860 (Intercept) -4.811 (Trend)	-3.223*** (Intercept) -3.933*** (Trend)	-7.364*** (Intercept) -7.116*** (Trend)
lnL	0.010 (Intercept) -2.144 (Trend)	0.005 (Intercept) -3.462 (Trend)	-4.381*** (Intercept) -4.211*** (Trend)	-6.896*** (Intercept) -6.659*** (Trend)
lnGDP	-2.045 (Intercept) -1.999 (Trend)	-3.165 (Intercept) -3.034 (Trend)	-6.252*** (Intercept) -6.039*** (Trend)	-6.252*** (Intercept) -6.039*** (Trend)

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lnTer	-2.084 (Intercept) -1.520 (Trend)	-5.099* (Intercept) -6.950* (Trend)	-4.011*** (Intercept) -3.995*** (Trend)	-5.064*** (Intercept) -4.910*** (Trend)
lnFDI	-0.610 (Intercept) -2.589 (Trend)	-1.846 (Intercept) -2.573 (Trend)	-3.321* (Intercept) - 5.773* (Trend)	-5.607* (Intercept) -5.637 (Trend)

*Note: *, **, *** denotes rejection of the null hypothesis at the 1%, 5%, and 10% significance level. The number of lags is selected by the Schwarz info criterion with a maximum lag of 15. The bandwidth for the PP test is selected automatically by Newey–West Bandwidth, using the Barlett Kernel spectral estimation method. lnK, lnL. lnGDP, lnFDI, lnTer are the logged values of Capital, Labor, Gross Domestic Product, Foreign Direct Investment, and Terrorism.*

Table 3: ARDL bounds cointegration test

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	6.033799	10%	2.45	3.52
k	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06

t-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-7.369138	10%	-2.57	-3.66
		5%	-2.86	-3.99
		2.5%	-3.13	-4.26
		1%	-3.43	-4.6

Table 3 provides clear evidence of significant long-run cointegration among the variables. The F-statistic value of 6.033 exceeds the upper and lower bound critical value of 3.74 and 5.06 at the 1% significance level. This result leads to the rejection of the null hypothesis, which assumes no level relationship, in favor of the alternative hypothesis, confirming the existence of a long-run level relationship. These test statistics indicate that the variables are cointegrated and share a stable long-term equilibrium connection.

ARDL model estimation

Table 5: Estimation of the ARDL model

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob**
$\Delta lnTer_{t-1}$	-0.434	0.002	-162.823	0.003
ΔlnL	0.842	0.003	271.056	0.002
ΔlnL_{t-1}	0.079	0.002	33.269	0.019
ΔlnK	-0.403	0.001	-281.678	0.002
ΔlnK_{t-1}	0.230	0.001	202.822	0.003
$\Delta lnGDP$	0.087	0.000	213.042	0.003
$\Delta lnGDP_{t-1}$	0.048	0.000	134.258	0.004

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ΔlnFDI	0.331	0.001	285.611	0.002
CoinEq(-1)*	-0.883	0.058	-15.100	0.000
ARDL (2,2,2,2,2)		**R^2: 0.99%**		

Note: variables were significant at the 10%, 5% and 1% levels

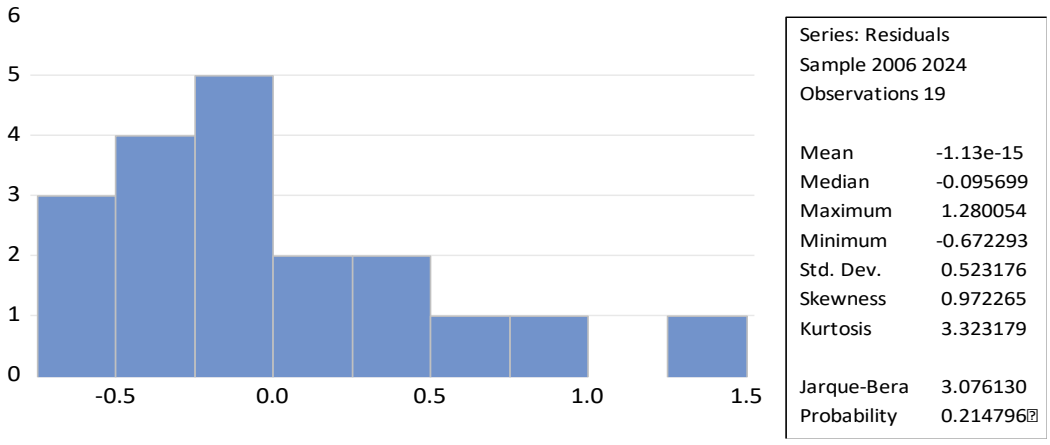
Table 5 presents the ARDL model estimation results. The error correction term (CoinEq(-1)) coefficient of − 0.883 indicates a rapid speed of adjustment, with approximately 88.3% of deviations from the long-run equilibrium being corrected within one period. In the long-run estimation, terrorism exerts a negative and statistically significant impact on economic growth. Inferentially, a 1% increase in Somalia's terrorism acts is associated with a 0.434% reduction in economic growth. This outcome reflects the potential long-term impact of terrorism on economic growth in Somalia. However, Persistent terrorism instability could deter foreign direct investment (FDI) in sectors reliant on stable infrastructure. Investors must remain vigilant for resurgence, especially in rural areas critical to agriculture and mineral extraction. Moving on to FDI, it shows a significant positive relationship with economic growth in Somalia. In the long-run, a 1% increase in FDI increases economic growth by 0.331%. Although (FDI) inflows, concentrated in telecommunications, infrastructure, and energy. It also grew by 6 per cent, totaling US$677 million in 2023, up from US$636 million (6 per cent of GDP) in 2022. Capita (K) and labor (L) both exhibit positive and significant effects on economic growth in Somalia. Interpretively, a1% increase in capital leads to a 0.230% increase in economic growth, while a 1% increase in labor results in a 0.842% rise in economic growth in Somalia. These coefficients indicate that both capital and labor are key contributors to increased economic growth in Somalia over the long-term.

Table 6: Diagnostic Statistical Tests

Test	**Chi-square statistic**	**P-value**	**Decision**
Breusch Godfrey LM test	2.198	0.333	No serial correlation
Breusch-Pagan-Godfrey test	1.783	0.775	No heteroskedasticity

Table 6 outlines the results of the diagnostic statistical tests performed to evaluate different aspects of the ARDL model's validity. The Breusch-Godfrey LM test reveals no significant evidence of serial correlation in the residuals, indicating that the residuals do not exhibit a systematic correlation pattern. This outcome supports the model's ability to accurately capture the relationships among the variables. Additionally, Breusch-Pagan-Godfrey's test for heteroskedasticity confirms the absence of heteroskedasticity in the residuals, suggesting that the residuals maintain constant variance, which further reinforces the model's robustness.

Figure 2: Histogram Normality Test



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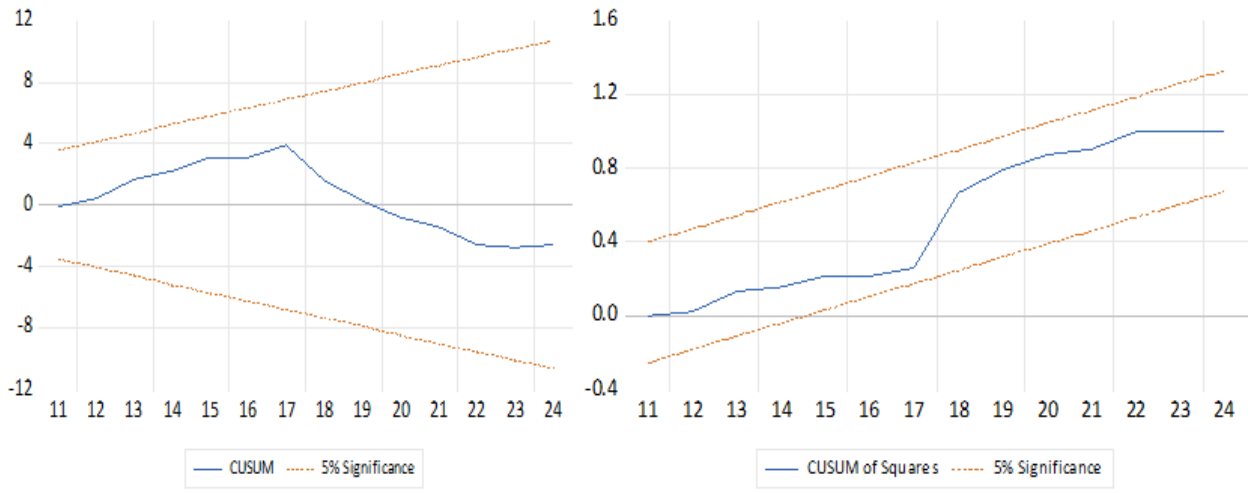
Histogram Normality Test is an informal, visual method used to assess whether a dataset follows a normal distribution. In figure 2, the probability test of 0.214 is greater than the benchmark value of 0.05, showing that the residuals are normally distributed in the model.

Table 7: Ramsey RESET Test

	Value	df	Probability
t-statistic	0.016149	13	0.9874
F-statistic	0.000261	(1, 13)	0.9874
Likelihood ratio	0.000381	1	0.9844

The Ramsey RESET Test (Regression Equation Specification Error Test) is a diagnostic test used in linear regression analysis to check for model misspecification particularly whether the model suffers from Omitted variables, Incorrect functional form (e.g., should be nonlinear), Ignored interactions or nonlinearities. In table 7 above, both probability values are greater than 0.05 meaning that the mathematical specification of the model is well specified, implying that there is linear relationship between the dependent and dependent variables

Figure 3: CUSUM and CUSUM Square Parameter Stability Tests



CUSUM & CUSUM square parameter stability test is used to detect the instability of the variables and the coefficients. This test is most commonly employed in time series data after the Error Correction Model is conducted, to reveal the existence of any structural breakpoint. The CUSUM &CUSUM square figure above indicate that the parameters estimated are stable during the sample period (2006-2024) and can best explain the variation in the dependent variable (GDP).

Concluding Remark

The aim of this study was to investigate the long-run relationship between economic growth measured by Gross Domestic Product (GDP) and terrorism in Somalia for the period of 2006 to 2024. Firstly, the Dickey Fuller and Philip Perron unit root tests were conducted to ensure stationarity of the variables and it was found that variables were stationary of mixed order and the choice of auto-regressive distributive lag (ARDL) model was appropriate. The study employed ARDL model to examine long-term relationship between the variables, The results of the ARDL model confirm the presence of a long-term relationship between economic growth and terrorism in Somalia. Somalia's national economic council in its state of the economy 2023 report affirmed that destabilizing terrorist group holding swathes of land in the most productive parts of the country, crippling local production, major supply routes and limiting the movement of people and goods as the nation's most pressing priorities. The negative and significant impact of terrorism on Somalia's economy is an inficator on that ongoing national struggle.

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RECOMMENDATIONS

Al-Shabaab's resilience and endurance in the face of fierce clashes spearheaded by the federal government of Somalia together with the regional and international allies was due to the millions of dollars they had generated from the areas the fully control and the annual Zakat and taxes they impose on the private sector business entities in the capital city of Mogadishu. Therefore, Tracking and shutting down these sources of terrorist financing and money laundering machinery will contribute to suffocate al-Shabaab financially, and that will hinder their biggest operations which is explosions and violence against civilians. Explosions only constitute 38 percent of all recorded terrorist incidents, and carrying out those atrocities need a huge amount of money.

Pursuant to Article 20 and 21 of AML/CFT act 2016, Financial Reporting Centre (FRC) is mandated to monitor, track and closure of sources of terrorist funding and money laundering machinery. They are also mandated to receive, analyze, and disseminate information and intelligence related to money laundering and terrorism financing to the law enforcement and other intelligence bodies. This study strongly recommends equipping, resourcing and strengthening these institutions since Al-Shabaab is receiving a huge amount of money from an unknown source within the country to facilitate their heinous acts. And so far, a good job is being done, over 250 bank accounts suspected to be linked to terrorism financing in third and fourth quarter of 2022 and first quarter of 2023.

Another crucial recommendation this study is proposing is the ideological front, whereby Al-Shabaab solely claims stewardship of the Islamic religion. The federal government of Somalia should no longer neglect the religious space, they should organize the prominent Somali scholars to denounce Al-Shabab as religious thugs and declare them as Kharijites. This will educate the illiterate nomads in remote areas not to join them because they made up the biggest percentage of Al-Shabaab fighters.

Community fighters and clan militias, locally known as "Ma'awisley," have done a marvelous job when they took the lead in fighting Al-Shabaab. Those local fighters seized vast areas from al-Shabaab between August 2022 and January 2023. During that effort, the Somali National Army and Ma'awisley fighters liberated more than 70 communities and a villages, some of them were liberated after 13 years under al-Shabaab control. And for the fact that some clans are divided internally uniting them, arming them and providing them with logistical support, ammunition, food and medical evacuations together with monthly stipend to encourage them will demonstrate that civilians have turned against al-Shabaab, and that will erase a strategy that Al-Shabaab have been capitalizing a long time (Divide and Conquer).

Lastly and most importantly, since Al-Shabaab was in existence for almost two decades they have infiltrated government institutions, security organs and other key offices who secretly work with them. This infiltration has allowed the group to access critical intelligence information, including sensitive details about military operations. Cracking down those Al-Shabaab agents who are working behind the shadow and bringing them to justice will shorten the time frame government is taking to eradicate Al-Shabaab from the government most sensitive organs to safeguard the intelligence information concerning war against terror.

REFERENCES

1. Ali, D. M. (2023). Impact of Foreign Direct Investment on Economic Growth in Somalia: VAR Model Analysis. American Journal of Economics, 13(2), 52-59.
2. African Development Bank. (n.d.). Retrieved May 12, 2023, from https://www.afdb.org/en/news-and-events/pressreleases/african-development-fund-mobilizes- 89-billion-africas-low-income-countries-highest-its-50-year-history-57132
3. Ahmed, A.. (2020). Climate Change and Food Security in Somalia: A Review. Sustainability, 12(4), 1500.)
4. Alade, O.B., Mba, I., Aduku, E.B., & Ameh, C.A. (2021). Terrorism, Human Capital Development and Economic Growth inNigeria. International Journal of Economics Development Research, 2(2), 142-155
5. Anwar, M. (2020). Domestic Terrorism, Investment and Economic Growth: Evidence from Developing Countries. International Review of Management and Business Research. https://doi.org/10.30543/9-4(2020)-20

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue X October 2025

6. Federal Government of Somalia. (2022) Somalia's First Adaptation Communication to the United Nations Framework Convention on Climate Change. Directorate of Environment and Climate Change. Mogadishu, Somalia Federal Republic of Somalia. (2019) National Environmental Policy
7. International Monetary Fund. (November, 2022). Staff Report for the 2022 Article IV Consultation and Fourth Review Under the ECF Arrangement. Country Report No. 2022/375. P. 23-25
8. Mathiyalagan, Y., & Padli, J., (2022). Impacts of Terrorism on Economic Growth and Foreign DirectInvestment in Developing Asian Countries: Malaysia, Indonesia and Philippines. International Journal of Finance,Economics and Business, 1(1), 57-66. https://doi.org/10.56225/ijfeb.v1i1.5
9. Maria Safdar, 2020. "*The Impact Of Terrorism On Economic Growth In Pakistan: An Empirical Analysis," Bulletin of Business and Economics (BBE)*, Research Foundation for Humanity (RFH), vol. 9(4), pages 191-201, December.
10. Mehmet Çinar (2017). The effects of terrorism on economic growth: Panel data approach 98 Zb. rad. Ekon. fak. Rij. • 2017 • vol. 35 • no. 1 • 97-121
11. National Economic Council (2023). State of the Economy Report 2023 - Volume 1. NEC Publications, Federal Republic of Somalia.
12. National Bureau of Statistics. (2022). Somalia Gross Domestic Product Report 2022. Retrieved from https://nbs. gov.so/wp-content/uploads/2023/07/Somalia-Gross-Domestic-Product-Report-2022-1.pdf
13. Siddique, H. M. A. and Liqat, R. and Ullah, K. (2017). Impact of Terrorism on Investment: Evidence from Pakistan. Bulletin of Business andEconomics, 6(4), 195-199
14. Siddique, H. M. A. and Liqat, R. and Ullah, K. (2017). Impact of Terrorism on Investment: Evidence from Pakistan. Bulletin of Business andEconomics, 6(4), 195-199
15. World Bank. (2022). Somalia Economic Update, Seventh Edition: Investing in Social Protection to Boost Resilience for Economic Growth. Washington D.C.: World Bank Group.
16. Ünsal, Y., & Çınar, İ. T. (2022). Economic Growth and Terrorism in the Middle East: A Heterogeneous Panel Causality Approach. Ekonomik Ve Sosyal Araştırmalar Dergisi, 18(1), 17-27.