JBASS
Journal of Business Administration and Social Studies

ORIGINAL ARTICLE
DOI: 10.5152/JBASS.2024.23034

# Analyzing the Impact of Ethnic Diversity on Terrorism in Africa

## *Afrika'da Etnik Çeşitliliğin Terörizm Üzerindeki Etkisinin Analizi*

Kazeem Bello Ajide

Department of Economics, University of Lagos, Lagos, Nigeria

**Abstract**

The study investigates the intricate interplay between ethnic diversity and terrorism in African countries. Over the period from 1980 to 2012, it employs a two-step system generalized method of moments estimator to analyze domestic, transnational, uncertain, and total terrorism indicators across 53 African nations. Notably, the study reveals the multifaceted impact of ethnic diversity on terrorism: ethnic diversity is explored in terms of fractionalization and polarization, with religion fractionalization found to mitigate domestic, transnational, and total terrorism. Language diversity also plays a role in reducing terrorism levels. However, ethnic polarization is associated with an increase in uncertain terrorism. Furthermore, the research uncovers a persistent trend in all forms of terrorism, indicating that countries with lower terrorism levels are gradually catching up with those experiencing higher levels of terrorism. The study also emphasizes the significance of various covariates, including the inequality-adjusted human development index and military expenditure, in influencing terrorism in African countries. Overall, the research provides valuable insights into the nuanced relationship between ethnic diversity and terrorism in Africa, offering potential policy implications for addressing terrorism in the region.

*Keywords: Africa, ethnic diversity, generalized method of moments (GMM), terrorism*

**ÖZ**

Bu çalışma, Afrika ülkelerinde etnik çeşitlilik ile terörizm arasındaki karmaşık etkileşimi inceler. 1980 ile 2012 yılları arasını kapsayan dönemde, 53 Afrika ülkesindeki yerel, uluslararası, belirsiz ve toplam terörizm göstergelerini analiz etmek için İki Aşamalı Sistem Genelleştirilmiş Momentler Yöntemi (GMM) tahmincisi kullanılmıştır. Çalışma, etnik çeşitliliğin terörizm üzerinde çok yönlü etkisini ortaya koyar: Etnik çeşitlilik, parçalanma ve kutuplaşma terimleri ile incelenmiş, din parçalanmasının yerel, uluslararası ve toplam terörizmi hafiflettiği bulunmuştur. Dil çeşitliliği de terörizm seviyelerini azaltmada rol oynar. Ancak, etnik kutuplaşma belirsiz terörizmde bir artışla ilişkilendirilmiştir. Ayrıca, araştırma, tüm terörizm formlarında, daha düşük terörizm seviyelerine sahip ülkelerin, daha yüksek terörizm seviyeleri yaşayanlarla kademeli olarak yakınlaştığını gösteren sürekli bir eğilim ortaya çıkarmıştır. Çalışma ayrıca, Afrika ülkelerinde terörizmi etkileyen çeşitli kovaryantların, özellikle eşitsizlik düzeltilmiş insan gelişimi endeksi ve askeri harcamaların önemini vurgular. Genel olarak, araştırma, Afrika'da etnik çeşitlilik ile terörizm arasındaki ince ilişkiye değerli içgörüler sağlayarak, bölgede terörizmi ele almak için potansiyel politika sonuçları sunar.

*Anahtar Kelimeler: Afrika, etnik çeşitlilik, genelleştirilmiş momentler yöntemi (GMM), terörizm*

**Cite this article as**: Ajide, K. B. (2023). Analyzing the impact of ethnic diversity on terrorism in Africa. *Journal of Business Administration and Social Studies*, 8(1), 67-80.

**Corresponding Author**: Kazeem Bello AJIDE
**E-mail:** Kazeemajide@gmail.com

Received: November 27, 2023
Revision Requested: January 17, 2024
Last Revision Received: January 18, 2024
Accepted: January 28, 2024
Publication Date: March 6, 2024



## Introduction

Terrorism and its far-reaching consequences have become a prominent global concern, capturing the attention of researchers and policymakers alike (Alfa-Wali et al., 2015; Asongu et al., 2015a, 2018). While terrorism is not a new threat, it gained

worldwide prominence following two major catastrophic events: the 9/11 attacks on the World Trade Center in the United States in 2001 and the series of events known as the Arab Spring, which swept through Tunisia, Egypt, Libya, Syria, and Yemen. These incidents paved the way for a surge in terrorist attacks in various regions worldwide (Norris et al., 2003).

According to data from the Global Terrorism Index (GTI, 2014), Boko Haram in Nigeria holds the grim distinction of being the deadliest terrorist organization, with a recorded death toll of 6644, surpassing even the Islamic State of Iraq and the Levant (ISIL), with 6073 deaths. In addition to Boko Haram, Africa is home to other notable terrorist organizations, including Al-Qaeda in the Islamic Maghreb, Ansar Al-Shariya in Tunisia, and Al-Shabaab in Kenya and Somalia. These groups have been responsible for devastating attacks such as the Westgate shopping mall massacre in 2013, the Garissa University killings in Kenya by Al-Shabaab, the Mali Radisson Blu hotel attack in 2015, and the Sinai Russian plane crash in 2015. These acts of terrorism, along with their significant socioeconomic costs in terms of human lives and property, have spurred extensive empirical research into their root causes.

Numerous factors have been identified in the peace and conflict literature as primary drivers of terrorism. These include economic deprivation, socio-economic and demographic strain, political and institutional factors, political transformation and instability, global economic and political dynamics, the contagion effect, and identity and cultural clashes. This study adds to the existing literature by specifically examining the impact of ethnic diversity on terrorism in Africa, focusing on the potential role of ethnicity as a driving force.

Ethnic diversity has often been associated with negative socioeconomic and political consequences. It has been linked to social conflicts, reduced social trust, challenges in providing public goods and maintaining governance quality, hindered economic development, public health issues, macroeconomic instability, reduced political participation, and challenges in sustaining democracy. This negative perspective on ethnic diversity has led to the concept of the "Ethnic Diversity Debit Thesis."

Moreover, terrorism has been a potent tool for political violence, with many terrorist organizations purportedly advancing the interests of ethnic groups. Ethnic-based organizations may find it easier to recruit, garner resources, strategize, and operate effectively. As such, ethno-national and ethno-religious groups have been responsible for some of the most lethal terrorist attacks.

Africa, in particular, is characterized by significant ethnic diversity, with numerous countries in the sub-Saharan region being ethnically heterogeneous. The diverse ethnic composition, coupled with linguistic and religious variations, has made Africa stand out as a continent with rich cultural diversity. This study considers the influence of ethnic diversity on terrorism, with a focus on its fractionalization and polarization measures.

To unravel the causal link between ethnic diversity and terrorism in Africa, this study employs the system generalized method of moments (GMM) estimation technique. Generalized method of moments is chosen for its ability to account for the continuous structure of the dataset, cross-country variations, persistence in terrorism outcomes, and biases in the estimation process. The study also considers different forms of terrorism, including domestic, transnational, unclear, and total terrorism, to provide a comprehensive analysis.

Overall, this study contributes to the existing literature by highlighting the role of ethnic diversity, specifically focusing on measures of religion, language, and ethnicity. The findings reveal the complex relationship between ethnic diversity and terrorism, shedding light on how different forms of diversity impact various types of terrorism. Additionally, the study underscores the persistence of terrorism and the significant roles of inequality-adjusted human development and military expenditure as covariates.

**Literature Review**

This section elucidates the conceptual foundations of two pivotal variables: terrorism and ethnic diversity. Terrorism, defined as the unlawful use of violence and intimidation for political aims, often by non-state actors, involves intentional violence and fear. Ethnic diversity refers to the presence of distinct ethnic groups with diverse cultural, linguistic, religious, and ancestral backgrounds within a given community.

Examining the empirical aspects of the relationship between ethnic diversity and terrorism, the paper reviews existing studies in chronological order. Walker and Chestnut (2003) delve into the effects of terrorism on Americans, emphasizing ethno-cultural variables in shaping responses. Their research, drawing from diverse sources, underscores the influence of ethnic background, gender, and age on reactions to terrorism. The study highlights the importance of considering ethno-cultural variables in mental health interventions and research to address the diverse backgrounds of those affected by terrorism.

Contributing insights on the covariates of terrorist attacks at the local level, Nemeth, Mauslein, and Stapley (2014) focus on ethnic diversity measured by the number of ethnic groups present. Findings indicate that ethnic diversity serves as a predictor of targeting in democratic countries, suggesting a context-specific nature of ethnic diversity in fostering competition among ethnic groups within democratic settings.

Choi and Piazza (2016) contribute to understanding the link between ethnic exclusion and domestic terrorism. Analyzing data from 130 countries (1981–2005), their findings reveal a significant association between the exclusion of specific

ethnic populations from political power and an increased likelihood of domestic terrorist attacks. Ethnic group political exclusion emerges as a more consistent predictor of domestic terrorist activity than general repression or economic discrimination.

Exploring the connection between ethnic divisions and local-scale terrorist attacks, Python, Brandsch, and Tskhay (2017) propose that terrorists in ethnic contexts may employ distinct provocation strategies. They estimate ethnic division indices at the sub-national level, finding that areas with heightened ethnic polarization witnessed more terrorist attacks, establishing ethnic polarization as a robust predictor.

Choi (2022) delves into the under-examined link between nationalism and terrorist violence by ethnic groups. The study posits that leader nationalism significantly drives ethnic terrorism. Using a sample of 766 ethnic groups (1970–2009), results support the argument that nationalism increases the likelihood of terrorist attacks.

In summary, these studies contribute to an evolving understanding of the ethnicity–terrorism nexus. They explore diverse dimensions, providing valuable insights into the complex interplay between ethnicity and terrorism. The acknowledgment of gaps in existing knowledge underscores the significance of the research, particularly within the African continent and from the perspective of multiple terrorism dimensions.

**Material and Methods**

The research in question delves into the examination of the causal connection between ethnic diversity and terrorism within the time frame of 1980–2012, encompassing data from 53 countries[1]. The study draws upon various sources for its variables, including studies by Alesina et al(2003)[2] and Montalvo and Reynal-Querol (2005), as well as datasets such as the Global Terrorism Database, International Terrorism: Attributes of Terrorist Events, and the World Bank Development Indicators.

Terrorism is defined in this study as the utilization or threat of force by non-state actors to attain political objectives through intimidation. To quantify instances of terrorism, researchers in this investigation adopt an annual count of terrorist incidents within a specific country. To tackle issues related to data containing zeros (indicating no incidents) and distributions that are skewed, the researchers employ a method inspired by Asongu and Biekpe (2017). This method involves adding one to the count and subsequently taking the natural logarithm of this adjusted figure, aligning with contemporary terrorism research. Similar approaches have been utilized in noteworthy studies by Choi and Salehyan (2013), Bandyopadhyay et al. (2014), and Efobi and Asongu (2016). The study categorizes terrorism into four primary groups: Domestic, Transnational, Unclear, and Total[3], facilitating a more nuanced analysis of diverse terrorism aspects.

The study incorporates ethnic diversity as a crucial variable. It is worth noting that the previously devised ethnicity measures by a team of Soviet ethnographers in the early 1960s, published in the Atlas Narodov Mira (1964), faced considerable criticism for several reasons. These concerns encompassed issues related to the underlying data used for the index, the attempt to summarize a nation's ethnic diversity with a single index, and the challenges in applying this measure. In more recent research, Alesina and his colleagues (2003) compiled a comprehensive dataset that encompasses ethnic, linguistic, and religious groups across up to 198 countries. They used the Herfindahl Concentration Index to gauge the likelihood that two randomly chosen individuals from a specific country or region belong to different ethnic groups. A notable advantage of using these measures is that Alesina and his team provided detailed data on various groups and drew from multiple sources.

However, it is important to acknowledge that ethnic diversity is a complex and multifaceted concept, making its precise definition a challenging task. In terms of its potential connection to terrorism, our hypothesis suggests a positive relationship. We propose that marginalized segments of society, particularly along ethnic lines, are more susceptible to mobilization. In extreme cases, this mobilization can lead to violence and the formation of terrorist groups. Prior research has shown that ethnic exclusion and limited political access can serve as motivating factors for civil conflict, and by extension, can contribute to the emergence of terrorism (as seen in Asal & Phillips 2016; Cederman et al. 2010, 2013; Gurr 1994).

In addition to the main factors under consideration, there are several other covariates that may influence the occurrence of terrorism. These include gross domestic product (GDP) growth, internet penetration, inequality, human development index, military expenditure, and political regime. In the following discussion, we outline the theoretical expectations regarding these explanatory variables.

Gross domestic product growth: GDP growth serves as a gauge of a country's economic prosperity. It is reasonable to argue that a thriving economy is likely to reduce instances of social unrest and, consequently, terrorism. This is because a robust economy can allocate resources to prevent and absorb economic shocks that may be associated with terrorist activities.

1 See the appendix for the list of countries.

2 Alesina et al. (2003) sourced data from Encyclopedia Britannica (2000), CIA (2000), Levinson (1998), Minority Rights Group International (1997), and National Censuses.

3 Domestic terrorism involves attacks within a country, targeting its own people. Transnational terrorism spans multiple countries. Unclear terrorism blurs domestic and transnational lines. Total terrorism combines all categories, encompassing all terrorist activities.

This perspective aligns with the views of Gailbulloev and Sandler (2009), and therefore, we hypothesize a negative relationship between GDP growth and terrorism.

Internet penetration: The internet is a major tool used by terrorist organizations for coordination, communication, and recruitment. As a result, we expect a positive relationship between internet penetration and terrorism. Greater internet access provides terrorists with more opportunities to carry out their activities, and this viewpoint is in line with this expectation.

Inequality-Adjusted Human Development Index (IHDI): The relationship between the human development index, adjusted for inequality, and terrorism is expected to be inverse. Inclusive development tends to reduce feelings of alienation among people, and this can mitigate the appeal of terrorist groups. This perspective is supported by the research of Foster (2014), who identified socioeconomic exclusion as a key factor driving the involvement of Western-born and educated youths in organizations like the ISIL.

Military expenditure: The role of military expenditure in combating terrorism is a subject of debate. While some theories suggest a positive relationship between military spending and terrorism reduction, others argue the opposite. The former viewpoint proposes that a well-funded military can effectively combat terrorism, while the latter maintains that military actions may not necessarily quell terrorism but might exacerbate it. In practice, a positive relationship is often posited when addressing this divergence.

Political regime: The type of political regime in a country significantly influences the intensity of terrorist activities. Democratic environments often provide fundamental rights and freedoms, allowing for peaceful conflict resolution. However, to some, this freedom may lead to challenges to the authorities or even the formation of terrorist groups due to easy access to weapons. Autocratic regimes, in contrast, tend to be highly intolerant of opposition and may prevent illegal gatherings. The direction of impact on terrorism is ambiguous, as both democratic and autocratic systems can have varying effects.

Table 1 exhibits descriptive statistics for various variables. Among terrorism types, domestic terrorism stands out with the highest mean value of 42.4, followed closely by transnational terrorism at an average of 0.236, and unclear terrorism with the lowest value. This suggests a higher prevalence of domestic terrorism in the African environment. In terms of variability, domestic terrorism retains the top position, followed by transnational terrorism. Ethnic diversity has an average value of 0.62, while language and religion diversity average at 0.58 and 0.456, respectively.

Moving on to Table 2, it presents the correlation matrix for the same variables. The correlation values for terrorism markers are notably strong, indicating that these terrorism types should be considered separately in modeling, given their distinct associations.

**Table 1.**
*Descriptive Statistics*

| Variable | Mean | Standard Deviation | Minimum | Maximum | Obs |
|---|---|---|---|---|---|
| Domter | 0.424 | 0.915 | 0 | 6.234 | 1749 |
| Transter | 0.236 | 0.554 | 0 | 3.850 | 1749 |
| Unter | 0.123 | 0.451 | 0 | 4.875 | 1749 |
| Totter | 0.565 | 1.031 | 0 | 6.301 | 1749 |
| Ethnic | 0.620 | 0.250 | 0 | 0.930 | 1716 |
| Lang | 0.580 | 0.295 | 0.010 | 0.923 | 1683 |
| Rel | 0.456 | 0.279 | 0.003 | 0.860 | 1749 |
| Polreg | -7.006 | 20.850 | -88.000 | 10.000 | 1659 |
| Gdpg | 3.851 | 8.401 | -62.076 | 149.973 | 1630 |
| Internet | 3.684 | 7.382 | 0 | 55.416 | 1007 |
| Ihdi | 1.218 | 5.800 | 0.123 | 45.325 | 1279 |
| Military | 2.534 | 3.167 | 0.146 | 39.607 | 1048 |

Note: Domter = Domestic terrorism; Ethnic = Ethnic diversity; Gdpg = Growth rate of gross domestic product; Ihdi = Inequality-adjusted human capital development; Internet = Internet penetration; Lang = Language diversity; Military = Military expenditure; Polreg = Democracy; Rel = Religion diversity; Totter = Total; Transter = Transnational terrorism; Unter = Uncertain terrorism.

**Empirical Modeling and Estimation Approaches**

The empirical model applied in this study adheres to the terrorism framework established in previous empirical research. The model specification is specified as follows:

$$TERROR_{i,t} = \theta_0 + \theta_1 ETHDIV_{i,t} + \theta_2 \sum_{i=1}^{5} X_{i,t} + \varepsilon_{i,t} \quad (1)$$

Specifically, the reformulation of Equation (1) as presented in Equation (2) is consistent with this framework.

$$TERROR_{i,t} = \theta_0 + \theta_1 ETHDIV_{i,t} + \theta_2 GDPG_{i,t} + \theta_3 IHDI_{i,t} + \theta_4 MILEXP_{i,t} + \theta_5 INTERN_{i,t} + \theta_6 POLREG_{i,t} + \varepsilon_{i,t} \quad (2)$$

In Equation (2), TERROR is the variable representing terrorism, broken down into domestic, transnational, uncertain, and total categories. The dimension of ethnic diversity, denoted as ETHNICITY, includes factors such as ethnicity, language, and religion. The set of covariates, represented by X, encompasses variables such as GDP growth (GDPG), IHDI, military expenditure (MILEXP), internet penetration (INTERN), and political regime (POLREG). The parameters are denoted as $\theta$, and the error term $\varepsilon$ comprises both observed and unobserved omitted factors. The cross-sectional dimension of countries is indicated by the subscript i, while the time series dimension is denoted by the subscript t. A detailed explanation of the variables is provided in Table 3.

**Table 2.**
*Correlation Matrix*

| | domter | transter | unter | totter | ethnic | lang | rel | polreg | gdpg | internet | ihdi | Military |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Domter | 1 | | | | | | | | | | | |
| Transter | 0.604 | 1 | | | | | | | | | | |
| Unter | 0.627 | 0.509 | 1 | | | | | | | | | |
| Totter | 0.946 | 0.755 | 0.717 | 1 | | | | | | | | |
| Ethnic | -0.046 | 0.051 | -0.009 | -0.011 | 1 | | | | | | | |
| Lang | 0.039 | 0.090 | 0.053 | 0.071 | 0.770 | 1 | | | | | | |
| Rel | -0.051 | -0.031 | -0.012 | -0.055 | 0.397 | 0.456 | 1 | | | | | |
| Polreg | -0.116 | -0.117 | -0.044 | -0.129 | 0.090 | 0.076 | 0.004 | 1 | | | | |
| Gdpg | -0.053 | -0.077 | -0.136 | -0.090 | 0.062 | 0.073 | 0.033 | 0.227 | 1 | | | |
| Internet | 0.050 | 0.006 | -0.027 | 0.022 | -0.216 | -0.166 | -0.154 | 0.034 | 0.015 | 1 | | |
| Ihdi | 0.303 | 0.115 | 0.404 | 0.298 | 0.065 | 0.122 | 0.182 | -0.014 | -0.070 | -0.022 | 1 | |
| Military | 0.190 | 0.123 | 0.143 | 0.210 | -0.286 | -0.211 | -0.247 | -0.182 | -0.214 | -0.080 | 0.000 | 1 |

Note: Domter = Domestic terrorism; Ethnic = Ethnic diversity; Gdpg = Growth rate of gross domestic product; Ihdi = Inequality-adjusted human capital development; Internet = Internet penetration; Lang = Language diversity; Military = Military expenditure; Polreg = Democracy; Rel = Religion diversity; Totter = Total; Transter = Transnational terrorism; Unter = Uncertain terrorism.

**Table 3.**
*Variable Definitions*

| Variables | Signs | Variables | |
|---|---|---|---|
| Domestic terrorism | domter | Number of domestic terrorism (Ln) | Ender *et al*. (2011) and Gailbulloev *et al*. (2012) |
| Transnational terrorism | transter | Number of transnational terrorism (Ln) | Ender *et al*. (2011) and Gailbulloev *et al*. (2012) |
| Uncertain terrorism | unter | Number of uncertain terrorism (Ln) | Ender *et al*. (2011) and Gailbulloev *et al*. (2012) |
| Total terrorism | totter | Number of total terrorism (Ln) | Ender *et al*. (2011) and Gailbulloev *et al*. (2012) |
| Ethnic diversity | ethnic | Ethnic diversity | Encyclopedia Britannica |
| Language diversity | Lang | Language diversity | Encyclopedia Britannica |
| Religion diversity | Rel | Religion diversity | Encyclopedia Britannica |
| Democracy | polreg | Political regimes | Polity IV |
| Gross domestic product growth | gdpg | Growth rate of gross domestic product (%) | WDI(2017) |
| Internet penetration | Internet | Internet penetration (per 100 people) | WDI(2017) |
| Inclusive development | Ihdi | Inequality-adjusted human capital development | WDI(2017) |
| Military expenditure | Military | Total military expenditure as a percentage of GDP | WDI(2017) |

**Note:** Ln = Natural logarithm; UNDP = United Nations Development Program; WDI = World Development Indicators; WGI = World Governance Indicators.

To explore the causal relationship between ethnic diversity and terrorism, the study employs the system of generalized method of moments (SGMM). This choice is motivated by five key reasons. First, SGMM is apt for addressing the challenge of high persistence in the dependent variable, demonstrated by a correlation coefficient of 0.982[4] between terrorism and its first lag value. Second, SGMM is suitable for studies with more countries (N) than years (T), a characteristic of this study ($N$=53, T=33). Third, SGMM enables control over possible endogeneity in all regressors. Fourth, SGMM maintains

4 It is not presented in the text but can be made available upon request.

cross-country variation (see Arellano & Bover, 1995; Blundell & Bond, 1998; Bond, Hoeffler & Temple, 2001) and fifth, the system GMM estimator is deemed more suitable than the difference estimator according to prior research such as Asongu and Tchamyou (2018).

Instead of first differences, the study adopts forward orthogonal deviations based on the approach introduced by Roodman (2009a, b). This extension of Arellano and Bover (1995) is known for controlling cross-country dependence, limiting over-identification, and restricting the proliferation of instruments (Baltagi, 2008; Love & Zicchino, 2006). The two-step approach is employed to control for heteroskedasticity in residuals, as it aligns with heteroskedasticity, unlike the one-step approach.

$$TERROR_{i,t} = \varphi_0 + \varphi_1 TERROR_{i,t-\tau} + \varphi_2 ETHNICITY_{i,t} + \sum_{h=1}^{6} \pi_h X_{h,i,t-\tau} + \eta_i + \xi_t + \mu_{i,t} \quad (3)$$

$$TERROR_{i,t} - TERROR_{i,t-\tau} = \varphi_0 + \varphi_1 (TERROR_{i,t-\tau} - TERROR_{i,t-2\tau}) + \varphi_2 (ETHNICITY_{i,t} - ETHNICITY_{i,t-\tau}) + \sum_{h=1}^{5} \pi_h (X_{h,i,t-\tau} - X_{h,i,t-2\tau}) + (\xi_t - \xi_{t-\tau}) + \mu_{i,t-\tau} \quad (4)$$

Equations (3) and (4) represent the specification in levels and first differences, summarizing the estimation process of a standard system GMM following the baseline model. The parameters in these equations include $\theta$, $\tau$ denoted by $\tau$, country-specific effects represented by $\mu$, time-specific constants denoted by $\delta$, and the stochastic term represented by $\varepsilon$. Other variables remain consistent with the earlier description.

Post-estimation tests are conducted to verify the consistency of the SGMM parameters. These tests include the AR(2) test for second-order serial correlation and the Sargan and Hansen over-identification restriction (OIR) test to ensure instrument validity and the absence of correlation with error terms. The robustness of the Hansen (Sargan) OIR test is noted, although it is weakened by instruments, while the Sargan test is non-robust but not weakened by instruments. Additionally, the study ensures adherence to the rule of thumb requirement for restricting over-identification in each specification, with the number of instruments being less than the corresponding number of countries. Fisher and Wald tests are also applied to test the joint validity of the estimated parameters.

## Results and Discussion

Table 4 provides the results of our analysis on the causal relationship between ethnic diversity and terrorism. The findings may seem counterintuitive as they challenge the common belief that ethnolinguistic and religious heterogeneity often contributes to terrorism. This belief has been supported by prior research by Asal and Rethemeyer (2008) and Masters (2008), suggesting that ethno-national and ethno-religious groups might be responsible for some of the deadliest terrorist attacks. However, our results show a different perspective, especially when it comes to the impact of religious diversity on terrorism in Africa.

Surprisingly, our analysis reveals that religious diversity has a mitigating effect on terrorism in Africa. This effect is statistically significant across various terrorism indicators, except for cases of unclear terrorism. This unexpected outcome can be attributed to the fact that most religious doctrines preach against acts of violence, destruction, and killing of fellow human beings. For example, in Islamic teachings, the Quran (5: 32) states that "Whoever kills a person [unjustly]... it is as though he has killed all mankind. And whoever saves a life, it is as though he had saved all mankind." Similarly, in Christianity, the commandment "Thou shalt not kill" (Exodus 20:13) clearly condemns violence and killing. Therefore, it is evident that both prominent religions do not condone terrorism, which often involves killing as a central element.

Religious fractionalization holds promise in mitigating terrorism through several channels. First, the diversity of beliefs fosters tolerance, countering radicalization by exposing individuals to various perspectives. Second, heightened fractionalization may enhance social cohesion by cultivating a shared identity among diverse religious communities, diminishing the allure of extremist ideologies rooted in division. Third, interfaith dialogue and collaboration are more likely in such societies, building trust and understanding to reduce violent confrontations over religious differences. Last, societies with high religious fractionalization pose challenges for extremist ideologies, as the presence of multiple beliefs dilutes their influence and hinders mobilization.

In practice, terrorism in the African continent appears to transcend ethno-linguistic and religious diversity. Notably, groups like Boko Haram in Nigeria have caused immense harm and destruction, irrespective of the faith of their victims. They have targeted and damaged mosques, churches, and various other institutions. In summary, it appears that religious teachings across faiths are fundamentally against terrorism.

Moving on to other factors, our analysis indicates that both theIHDI and military expenditure have a positive and statistically significant association with terrorism. This suggests that terrorism tends to increase in regions where people face developmental disparities and when there is higher military expenditure. This finding aligns with the work of Asongu and Biekpe (2017), which also pointed to the relationship between underdevelopment and terrorism. Surprisingly, the increased spending on the military is not found to be a solution to ending terrorism but rather appears to amplify it.

Excessive military spending and interventions can inadvertently fuel terrorism through several channels. First, the blowback effect may amplify terrorism, as military actions generate resentment and hostility among affected populations, fostering recruitment by terrorist organizations. Second, the production and sale of weapons associated

**Table 4.**
*Estimation Result of Ethnic Diversity and Terrorism*

| | Domestic | | | Transnational | | | Unclear | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variables | (1) | (2) | (3) | (1) | (2) | (3) | (1) | (2) | (3) | (1) | (2) | (3) |
| **Constant** | 0.440 | 0.593 | 1.108*** | 0.073 | 0.158 | 0.530*** | -0.353** | -0.154 | -0.063 | 0.115 | 0.677* | 1.210*** |
| | (0.526) | (0.507) | (0.344) | (0.177) | (0.161) | (0.095) | (0.152) | (0.098) | (0.093) | (0.449) | (0.394) | (0.260) |
| **L1** | 0.325*** | 0.295*** | 0.341*** | 0.326*** | 0.334*** | 0.325*** | 0.402*** | 0.419*** | 0.417*** | 0.428*** | 0.398*** | 0.426*** |
| | (0.045) | (0.049) | (0.047) | (0.048) | (0.055) | (0.055) | (0.021) | (0.017) | (0.017) | (0.054) | (0.056) | (0.064) |
| **Ethnic** | -0.754 | | | -0.112 | | | 0.407* | | | -0.253 | | |
| | (0.817) | | | (0.250) | | | (0.208) | | | (0.694) | | |
| **Language** | | -1.066 | | | -0.262 | | | 0.113 | | | -1.311** | |
| | | (0.751) | | | (0.225) | | | (0.132) | | | (0.597) | |
| **Religion** | | | -2.267*** | | | -0.958*** | | | 0.004 | | | -2.161*** |
| | | | (0.634) | | | (0.156) | | | (0.131) | | | (0.480) |
| **Democracy** | -0.002 | -0.002 | -0.001 | 0.000 | 0.000 | 0.000 | 0.001** | 0.001*** | 0.001** | -0.001 | -0.001 | -0.000 |
| | (0.001) | (0.002) | (0.001) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.001) | (0.001) | (0.002) |
| **GDP Growth** | 0.007 | 0.006 | 0.008 | -0.009** | -0.012*** | -0.014*** | -0.007*** | -0.007*** | -0.008*** | -0.006 | -0.002 | -0.005 |
| | (0.004) | (0.004) | (0.005) | (0.004) | (0.003) | (0.004) | (0.001) | (0.001) | (0.001) | (0.005) | (0.005) | (0.006) |
| **Internet** | 0.002 | -0.003 | 0.002 | 0.002 | 0.002 | 0.003 | 0.005*** | 0.004*** | 0.003*** | 0.008* | 0.006 | 0.003 |
| | (0.005) | (0.005) | (0.005) | (0.002) | (0.002) | (0.002) | (0.001) | (0.001) | (0.001) | (0.004) | (0.005) | (0.004) |
| **Inequality HDI** | 0.038*** | 0.040*** | 0.039*** | 0.010*** | 0.010*** | 0.012*** | 0.037*** | 0.035*** | 0.035*** | 0.038*** | 0.040*** | 0.037*** |
| | (0.003) | (0.004) | (0.003) | (0.001) | (0.002) | (0.002) | (0.001) | (0.001) | (0.001) | (0.004) | (0.004) | (0.005) |
| **Military Exp.** | 0.126*** | 0.128** | 0.161*** | 0.078*** | 0.080*** | 0.070*** | 0.069*** | 0.067*** | 0.053*** | 0.163*** | 0.213*** | 0.160*** |
| | (0.041) | (0.059) | (0.042) | (0.017) | (0.018) | (0.019) | (0.022) | (0.018) | (0.019) | (0.055) | (0.064) | (0.049) |
| **AR (1)** | 0.000 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.098 | 0.107 | 0.097 | 0.000 | 0.001 | 0.000 |
| **AR (2)** | 0.179 | 0.151 | 0.168 | 0.108 | 0.072 | 0.106 | 0.429 | 0.433 | 0.42 | 0.096 | 0.058 | 0.084 |
| **Sargan OIR** | 0.000 | 0.001 | 0.001 | 0.01 | 0.064 | 0.092 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Hansen OIR** | 0.358 | 0.622 | 0.593 | 0.207 | 0.298 | 0.183 | 0.311 | 0.323 | 0.201 | 0.145 | 0.214 | 0.085 |
| *DHT for instruments (a) levels* | | | | | | | | | | | | |
| **H excluding group** | 0.251 | 0.269 | 0.250 | 0.272 | 0.352 | 0.381 | 0.256 | 0.245 | 0.235 | 0.056 | 0.068 | 0.060 |
| **Diff(null, H=exogenous)** | 0.471 | 0.796 | 0.783 | 0.239 | 0.302 | 0.155 | 0.399 | 0.428 | 0.259 | 0.454 | 0.571 | 0.269 |

(*Continued*)

**Table 4.**
*Estimation Result of Ethnic Diversity and Terrorism (Continued)*

| | Domestic | | | Transnational | | | Unclear | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variables | (1) | (2) | (3) | (1) | (2) | (3) | (1) | (2) | (3) | (1) | (2) | (3) |
| *(b) IV (year, eq(diff))* | | | | | | | | | | | | |
| **H excluding group** | 0.313 | 0.552 | 0.527 | 0.165 | 0.242 | 0.142 | 0.262 | 0.264 | 0.238 | 0.110 | 0.169 | 0.064 |
| **Dif (null, H=exogenous)** | 0.581 | 0.95 | 0.785 | 0.757 | 0.937 | 0.948 | 0.668 | 0.964 | 0.161 | 0.912 | 0.854 | 0.744 |
| **Fisher** | 17436.54 | 57427.04 | 27841.25 | 12105.35 | 11356.17 | 7811.01 | 347208.15 | 506728.33 | 606727.28 | 11187.08 | 20412.81 | 20877.64 |
| **Instruments** | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| **Observations** | 647 | 628 | 647 | 647 | 628 | 647 | 647 | 628 | 647 | 647 | 628 | 647 |
| **Country** | 48 | 46 | 48 | 48 | 46 | 48 | 48 | 46 | 48 | 48 | 46 | 48 |

Note: AR (1) and AR (2) are respectively the first and second order Arellano and Bond autocorrelation tests in difference for the absence of autocorrelation in the residual. Bold Fisher values are significance at 1%.
DHT = Difference in Hansen test for exogeneity of instrument subsets; Military Exp = Military expenditure; OIR = Over-identifying restrictions test.
*Significance level of 10%.
**Significance level of 5%.
***Significance level of 1%.

with high military spending may contribute to arming non-state actors, including terrorists. Third, military interventions can lead to political instability and the breakdown of state institutions, creating power vacuums exploited by extremist groups. Addressing terrorism effectively requires a comprehensive approach beyond military solutions, encompassing diplomatic, economic, and humanitarian efforts. Critics argue that significant military allocations may divert funds from social programs, economic development, and education, exacerbating social and economic inequalities conducive to extremism. This unexpected result is consistent with a body of literature suggesting that military approaches to combating terrorism can inadvertently fuel terrorism further (see Asongu & Biekpe, 2017; Feridun & Shahbaz, 2010; Lum et al., 2006; Sandler, 2005).

The role of GDP growth is found to be significant in transnational and uncertain terror attacks but not in domestic and total terrorism. It suggests that economic growth might have a positive impact in preventing certain types of terrorist attacks, although its effectiveness varies across contexts.

Furthermore, the influence of the political regime is more noticeable in cases of uncertain terrorism, where it tends to promote rather than attenuate terrorism. This is not surprising; as political instability can create fertile ground for terrorism to thrive.

Last, there is a high degree of persistence in all terrorism indicators, as indicated by the lagged values of each type of terrorism. This suggests that countries with lower past experiences of terrorism are gradually catching up with those that have faced higher levels of terrorism. This concept extends beyond income convergence and has recently been applied to other aspects of development outcomes.

Overall, our findings challenge common beliefs about the relationship between ethnic diversity, religion, and terrorism, shedding light on the complex and multifaceted nature of this issue. The results also highlight the importance of factors like economic development, military spending, and political stability in understanding and addressing terrorism in the African context.

**Robustness Checks**

In order to assess the impact of fractionalization and polarization on terrorism, the study presents its findings in Table 5. This is a significant endeavor, as there is an ongoing debate in the academic community regarding the relative importance of fractionalization and polarization in the context of conflict management.

The study cites Montalvo and Reynal-Querol (2005), who argue that ethnic polarization can lead to conflicts, political instability, and even civil wars. They employed the empirical framework introduced by Mankiw et al. in 1992. Additionally, the same authors found that religious polarization is statistically more relevant than religious fractionalization in terms

**Table 5.**
*(A): Ethnic Diversity and Terrorism*

| | Domestic | | | | Transnational | | | |
|---|---|---|---|---|---|---|---|---|
| Variables | (1) | (2) | (3) | (4) | (1) | (2) | (3) | (4) |
| **Constant** | 0.785 | 1.070** | 0.462 | 1.023** | 0.426* | 0.081 | 0.351** | 0.302* |
| | (0.576) | (0.516) | (0.581) | (0.443) | (0.240) | (0.204) | (0.170) | (0.169) |
| **L1** | 0.298*** | 0.310*** | 0.346*** | 0.328*** | 0.312*** | 0.274*** | 0.299*** | 0.286*** |
| | (0.050) | (0.049) | (0.047) | (0.049) | (0.043) | (0.039) | (0.041) | (0.040) |
| **Ethnic polarization** | -1.297 | | | | -0.768* | | | |
| | (1.159) | | | | (0.419) | | | |
| **Ethnic fractionalization** | | -1.879** | | | | -0.001 | | |
| | | (0.868) | | | | (0.323) | | |
| **Religion polarization** | | | -0.696 | | | | -0.391* | |
| | | | (0.792) | | | | (0.214) | |
| **Religion Fractionalization** | | | | -2.373** | | | | -0.526 |
| | | | | (0.977) | | | | (0.354) |
| **Democracy** | -0.002 | -0.004** | -0.002 | -0.002 | 0.001* | 0.000 | -0.000 | -0.000 |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.000) | (0.000) | (0.000) | (0.000) |
| **GDP growth** | 0.003 | 0.011** | 0.009* | 0.010** | -0.014*** | -0.013*** | -0.012*** | -0.012*** |
| | (0.006) | (0.005) | (0.005) | (0.005) | (0.004) | (0.004) | (0.004) | (0.004) |
| **Internet** | 0.008 | 0.006 | 0.003 | 0.002 | 0.005** | 0.002** | -0.001 | -0.000 |
| | (0.008) | (0.005) | (0.004) | (0.004) | (0.002) | (0.001) | (0.001) | (0.001) |
| **Inequality HDI** | 0.045*** | 0.038*** | 0.036*** | 0.037*** | 0.013*** | 0.012*** | 0.010*** | 0.010*** |
| | (0.005) | (0.003) | (0.003) | (0.003) | (0.001) | (0.001) | (0.001) | (0.001) |
| **Military expenditure** | 0.135*** | 0.164*** | 0.158*** | 0.155*** | 0.082*** | 0.067*** | 0.065*** | 0.066*** |
| | (0.043) | (0.037) | (0.031) | (0.031) | (0.014) | (0.012) | (0.016) | (0.016) |
| **AR(1)** | 0.001 | 0.001 | 0.000 | 0.001 | 0.001 | 0.003 | 0.002 | 0.002 |
| **AR(2)** | 0.193 | 0.198 | 0.143 | 0.168 | 0.112 | 0.143 | 0.124 | 0.130 |
| **Sargan OIR** | 0.024 | 0.001 | 0.000 | 0.001 | 0.179 | 0.042 | 0.056 | 0.071 |
| **Hansen OIR** | 0.563 | 0.275 | 0.254 | 0.302 | 0.338 | 0.149 | 0.229 | 0.254 |
| *DHT for instruments (a) levels* | | | | | | | | |
| **H excluding group** | 0.285 | 0.261 | 0.248 | 0.257 | 0.461 | 0.399 | 0.236 | 0.316 |
| **Diff(null, H = exogenous)** | 0.709 | 0.342 | 0.325 | 0.384 | 0.282 | 0.114 | 0.300 | 0.271 |
| *(b) IV (year, eq(diff))* | | | | | | | | |
| **H excluding group** | 0.499 | 0.239 | 0.210 | .247 | 0.287 | 0.115 | 0.186 | 0.210 |
| **Dif(null, H = exogenous)** | 0.753 | 0.537 | 0.674 | 0.833 | 0.664 | 0.832 | 0.735 | 0.680 |
| **Fisher** | **15803.54** | **9673.31** | **15805.74** | **10767.06** | **20950.91** | **14778.55** | **40137.35** | **29422.19** |
| **Instruments** | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| **Observations** | 591 | 591 | 609 | 609 | 591 | 591 | 609 | 609 |
| **Country** | 42 | 42 | 43 | 43 | 42 | 42 | 43 | 43 |

Note: AR(1) and AR(2) are the first and second orders of the Arellano and Bond autocorrelation tests, respectively. Bold Fisher values are significance at 1%.
DHT = Difference in Hansen test for exogeneity of instrument subsets; HDI = Human Development Index; OIR = Over-identifying restrictions test.
*Significance level of 10%.
**Significance level of 5%.
***Significance level of 1%.

**Table 5.**
*B. Ethnic Diversity and Terrorism (Cont'd)*

| | Unclear | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|
| Variables | (1) | (2) | (3) | (4) | (1) | (2) | (3) | (4) |
| **Constant** | -0.451** | -0.375* | -0.180* | -0.163* | 0.878* | -0.012 | 0.568 | 0.650* |
| | (0.174) | (0.198) | (0.096) | (0.092) | (0.507) | (0.359) | (0.445) | (0.380) |
| **L1** | 0.422*** | 0.415*** | 0.404*** | 0.403*** | 0.444*** | 0.435*** | 0.435*** | 0.433*** |
| | (0.020) | (0.020) | (0.019) | (0.021) | (0.058) | (0.054) | (0.062) | (0.062) |
| **Ethic polarization** | 0.843*** | | | | -1.702* | | | |
| | (0.290) | | | | (0.944) | | | |
| **Ethnic fractionalization** | | 0.506 | | | | -0.056 | | |
| | | (0.304) | | | | (0.601) | | |
| **Religion polarization** | | | 0.158 | | | | -0.722 | |
| | | | (0.100) | | | | (0.617) | |
| **Religion fractionalization** | | | | 0.231 | | | | -1.461* |
| | | | | (0.150) | | | | (0.859) |
| **Democracy** | 0.000 | 0.001*** | 0.001*** | 0.001*** | 0.001 | -0.000 | 0.000 | 0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.002) | (0.002) | (0.002) | (0.002) |
| **GDP growth** | -0.011*** | -0.009*** | -0.010*** | -0.010*** | -0.015*** | -0.009 | -0.008 | -0.008 |
| | (0.002) | (0.001) | (0.001) | (0.001) | (0.006) | (0.006) | (0.006) | (0.006) |
| **Internet** | 0.003** | 0.004** | 0.003*** | 0.004*** | 0.017** | 0.015*** | 0.004 | 0.006 |
| | (0.001) | (0.002) | (0.001) | (0.001) | (0.007) | (0.004) | (0.004) | (0.004) |
| **Inequality HDI** | 0.033*** | 0.036*** | 0.036*** | 0.036*** | 0.041*** | 0.039*** | 0.035*** | 0.035*** |
| | (0.002) | (0.001) | (0.001) | (0.001) | (0.006) | (0.004) | (0.005) | (0.005) |
| **Military expenditure** | 0.049*** | 0.071*** | 0.070*** | 0.068*** | 0.212*** | 0.188*** | 0.169*** | 0.184*** |
| | (0.018) | (0.022) | (0.019) | (0.020) | (0.051) | (0.053) | (0.050) | (0.050) |
| **AR(1)** | 0.097 | 0.099 | 0.105 | 0.104 | 0.000 | 0.000 | 0.000 | 0.000 |
| **AR(2)** | 0.418 | 0.421 | 0.432 | 0.430 | 0.070 | 0.079 | 0.074 | 0.073 |
| **Sargan OIR** | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 |
| **Hansen OIR** | 0.191 | 0.458 | 0.366 | 0.315 | 0.238 | 0.147 | 0.142 | 0.147 |
| *DHT for instruments (a) levels* | | | | | | | | |
| **H excluding group** | 0.188 | 0.239 | 0.186 | 0.199 | 0.103 | 0.083 | 0.062 | 0.070 |
| **Diff(null, H = exogenous)** | 0.288 | 0.627 | 0.569 | 0.473 | 0.512 | 0.372 | 0.426 | 0.409 |
| *(b) IV (year, eq(diff))* | | | | | | | | |
| **H excluding group** | 0.203 | 0.464 | 0.304 | 0.268 | 0.196 | 0.113 | 0.110 | 0.115 |
| **Dif(null, H = exogenous)** | 0.230 | 0.294 | 0.876 | 0.642 | 0.669 | 0.895 | 0.775 | 0.734 |
| **Fisher** | **697855.05** | **323251.01** | **591714.07** | **515751.25** | **20294.06** | **11911.7** | **21423.55** | **15842.03** |
| **Instruments** | 25 | 25 | 25 | 25.000 | 25 | 25 | 25 | 25 |
| **Observations** | 591 | 591 | 609 | 609 | 591 | 591 | 609 | 609 |
| **Country** | 42 | 42 | 43 | 43 | 42 | 42 | 43 | 43 |

Note: AR (1) and AR (2) are respectively the first and second order Arellano and Bond autocorrelation tests in difference for the absence of auto-correlation in the residual. Bold Fisher values are significance at 1%.
DHT = Difference in Hansen test for exogeneity of instrument subsets; OIR = Over-identifying restrictions test.
*Significance level of 10%.
**Significance level of 5%.
***Significance level of 1%.

of ethnic diversity, with the latter being deemed statistically insignificant.

Horowitz (1985) contributes to the debate by suggesting that the relationship between ethnic diversity and civil wars is not linear. According to him, societies characterized by both high homogeneity and high heterogeneity experience less violence. More conflicts tend to arise in situations where a significant ethnic minority confronts an ethnic majority. He advocates for the use of polarization measures over fractionalization, which he considers insufficient.

Building upon this discourse, Mauro (1995) supports the adoption of polarization measures over fractionalization. He posits that fractionalization indices may not effectively capture extreme cases of civil wars, whereas polarization indices perform better in this regard.

Table 5 reveals that ethnic and religious fractionalization exerts a significant mitigating influence on domestic and transnational terrorism. The statistical significance is observed at a 5% level for domestic terrorism and a 10% level for transnational terrorism. The plausible explanations for these findings are multifaceted. In ethnically diverse societies, the presence of varied perspectives among different ethnic groups may render them less susceptible to extremist ideologies. This diversity fosters a sense of shared governance, diminishing the appeal of radical movements targeting specific ethnic groups. Additionally, resource competition within ethnically diverse societies may discourage any single group from resorting to terrorism to address grievances, considering the associated costs and risks. Regarding religious fractionalization, diverse religious communities act as a check on radicalization, reducing the allure of extremist ideologies. In religiously diverse societies, multiple religious groups may prompt inclusive government policies, minimizing religious tensions and lowering the likelihood of religiously motivated terrorism. Moreover, groups within such societies may be less inclined to resort to terrorism if they believe their interests can be addressed through non-violent means. Importantly, countries with diverse populations are more likely to engage in international cooperation, fostering interconnectedness and shared interests to address transnational issues like terrorism. These findings align with the arguments put forth by researchers like Mauro and Montalvo and Reynal–Querol, which question the adequacy of fractionalization measures.

Conversely, when it comes to ethnic polarization, the results in Table 5 suggest an amplifying effect on unclear terrorism, which is statistically significant at the 1% level. However, in the case of total terrorism, ethnic polarization is reported to have a mitigating impact, albeit at a lower level of statistical significance. High levels of ethnic polarization within a society can contribute to the emergence and escalation of terrorism through various interconnected factors. First, heightened polarization may trigger a perceived threat to individuals' ethnic identity, fostering feelings of marginalization and discrimination. This, in turn, can drive some individuals towards extremist ideologies and acts of terrorism as a means of asserting or protecting their identity. Second, unresolved ethnic grievances, such as historical injustices or discrimination, fueled by polarization, can provide fertile ground for recruitment by terrorist groups claiming to address these issues through violence. Third, ethnic polarization often cultivates an "us vs. them" mentality, where individuals perceive their ethnic group as superior and others as adversaries. This divisive mindset becomes exploitable by terrorist organizations seeking recruits among those who feel alienated or marginalized. Additionally, terrorist groups may manipulate ethnic polarization to attract individuals who feel disenfranchised, offering an alternative identity and purpose. Finally, high levels of ethnic polarization can lead to social fragmentation, making communities isolated and mistrustful, thereby creating an environment conducive to the covert operations of terrorist groups. Addressing ethnic polarization becomes crucial not only for social cohesion but also for preventing conditions that foster terrorism, emphasizing the importance of inclusive efforts and dialogue to mitigate these risks.

Religious fractionalization, on the other hand, continues to play a role in reducing the spread of terrorism, although its statistical significance is relatively low. Other factors, such as the IHDI and military expenditure, consistently maintain their significance and align with theoretical expectations across various terrorism indicators.

In terms of relevant statistics, first, the null hypothesis of the second-order Arellano and Bond autocorrelation test (AR (2)) in difference for the absence of autocorrelation in the residuals is not rejected as depicted in Tables 4 and 5 respectively. Second, the Sargan and Hansen OIR tests are not significant because their null hypotheses suggest that instruments are valid or not correlated with the error terms. Third, the Difference in Hansen Test for exogeneity of instruments is also employed to assess the validity of results from the Hansen OIR test. Fourth, a Fischer test for the joint validity of estimated coefficients is also provided. Additionally, the third and fourth points above are within the acceptable region of diagnostic tests.

The extensive empirical literature on the negative socio-economic and political consequences of ethnic diversity has introduced the concept of the "Ethnic Diversity Debit Thesis" to the field of ethnic diversity studies. However, a noticeable gap in this literature is the lack of exploration into the connection between ethnic diversity and terrorism. This study aimed to bridge this void by investigating the relationship between ethnic diversity and terrorism using four terrorism indicators across 53 African countries from 1980 to 2012. The analysis employed the two-step system generalized method of moments estimator and revealed several key findings.

First, religion fractionalization emerged as a significant mitigating factor against the spread of terrorism, particularly in the domains of domestic, transnational, and total terrorism. Language diversity also played a prominent role in curbing terrorism, notably at the 5% significance level. Additionally, both ethnic and religion fractionalization were shown to act

as “terror-neutralizers,” particularly in the context of domestic and transnational terrorism. Conversely, ethnic polarization was found to amplify terrorism. The study also highlighted a high level of persistence in all terrorism indicators, indicating that countries with lower prior experiences of terrorism were gradually catching up with those with higher incidence. Furthermore, the analysis underscored the crucial roles of the IHDI and military expenditure across various dimensions of terrorism.

Based on the established findings, several policy implications are recommended: first, promote ethnic diversity while emphasizing its contribution to development. Particularly, utilize religious platforms to address socio-political issues, given the significant role of religion in African society. Second, carefully discourage ethnic polarization, which can hinder national progress. This can be achieved through the establishment of a robust institutional framework to regulate extremist tendencies and boundary-violating behaviors. Third, ensure that development programs and policies are designed with inclusivity in mind to mitigate feelings of marginalization, alienation, and repression, which may contribute to terrorism. Fourth, prioritize peaceful conflict resolution methods to combat terrorism, avoiding the escalation that may result from the use of force. Fifth, address ethnic polarization underlying social, economic, and political issues, as well as promoting inclusive policies that bridge ethnic divides and promote a sense of shared national identity. Last, recognize the substantial negative externalities associated with terrorism and promote a collective approach to address this pressing issue.

This study acknowledges several limitations. First, the definition and measurement of ethnic diversity can be subjective, leading to variations in results and interpretations across different studies. Second, obtaining reliable and comprehensive data on both ethnic diversity and terrorism incidents may pose challenges due to potential biases or gaps in existing datasets. This limitation makes it difficult to draw accurate conclusions. Third, research involving terrorism raises ethical concerns, especially when sensitive data is involved or there is a risk of stigmatizing certain ethnic groups. Ensuring the ethical treatment of participants and responsible data handling is imperative. Additionally, interpreting the relationship between ethnic diversity and terrorism requires a deep understanding of various cultures and their dynamics; a lack of cultural competence may result in misinterpretations. Last, it is essential to recognize that the impact of ethnic diversity on terrorism may vary across different regions, cultures, and historical contexts. Failing to consider these contextual factors can limit the generalizability of study findings.

To further our understanding of the correlation between ethnic diversity and terrorism, future research can explore specific areas. One avenue involves investigating the potential transmission channels through which ethnic diversity influences terrorism within African countries, aiming to uncover underlying mechanisms. Another approach is to conduct a comparative analysis, considering variations and commonalities in the relationship between ethnic diversity and terrorism on a continent-by-continent basis. This comparative method has the potential to enhance our overall knowledge of this subject.

**Peer-review:** Externally peer-reviewed.

**Declaration of Interests:** The author has no conflict of interest to declare.

**Funding:** The author declared that this study has received no financial support.

**Hakem Değerlendirmesi:** Dış bağımsız.

**Çıkar Çatışması:** Yazar çıkar çatışması bildirmemiştir.

**Finansal Destek:** Yazar bu çalışma için finansal destek almadığını beyan etmiştir.

## References

Aghion, P., Alesina, A., & Trebbi, F. (2004). Endogenous Political Institutions. *Quarterly Journal of Economics*, *119*(2), 565–611. [CrossRef]

Ahlerup, P., Olsson, O., & Yanagizawa, D. (2009). Social Capital versus Institutions in the Growth Process. *European Journal of Political Economy*, *25*(1), 1–14. [CrossRef]

Akcinaroglu, S., & Radziszewski, E. (2013). Private military companies, opportunities, and termination of civil wars in Africa. *Journal of Conflict Resolution*, *57*(5), 795–821. [CrossRef]

Alesina, A. F., Devleeschauwer, A., Easterly, W., Kurlat, S., & Wacziarg, R. T. (2003). Fractionalization. NBER Working Paper no. 9411. [CrossRef]

Alesina, A., Baqir, R., & Easterly, W. (1999). Public goods and ethnic divisions. *Quarterly Journal of Economics*, *114*(4), 1243–1284. [CrossRef]

Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., & Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth*, *8*(2), 155–194. [CrossRef]

Alesina, A., & Drazen, A. (1991). Why are stabilization delayed? *Economic Review*, *81*, 1170–1188.

Alesina, A., Glaeser, E., & Sacerdote, B. (2001). *Why doesn't the US have a European style welfare state*? *Brookings Papers on Economic Activity*, *2001*(2), 187–277. [CrossRef]

Alesina, A., & La Ferrara, E. (2000). Participation in heterogeneous communities. *Quarterly Journal of Economics*, *115*(3), 847–904. [CrossRef]

Alesina, A., & La Ferrara, E. (2002). Who trust others? *Journal of Public Economics*, *85*(2), 207–234. [CrossRef]

Alesina, A., & La Ferrara, E. (2005). Ethnic diversity and economic performance. *Journal of Economic Literature*, *43*(3), 762–800. [CrossRef]

Alesina, A., & Zhuravskaya, E. (2011). Segregation and the quality of government in a cross section of countries. *American Economic Review*, *101*(5), 1872–1911. [CrossRef]

Alfa-Wali, M., Sritharan, K., Mehes, M., Abdullah, F., & Rasheed, S. (2015). Terrorism-related trauma in Africa, an increasing problem. *Journal of Epidemiology and Global Health*, *5*(2), 201–203. [CrossRef]

Anderson, C. J., & Paskeviciute, A. (2006). How ethnic and linguistic heterogeneity influence the prospects for civil society: A comparative study of citizenship behavior. *Journal of Politics*, *68*(4), 783–802. [CrossRef]

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*, *58*(2), 277–286. [CrossRef]
Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error components models. *Journal of Econometrics*, *68*(1), 29–51. [CrossRef]
Asal, V., Findley, M. G., Piazza, J. A., & Walsh, J. I. (2016). Political exclusion, oil, and ethnic armed conflict. *Journal of Conflict Resolution*, *60*(8), 1343–1367. [CrossRef]
Asal, V., & Rethemeyer, R. K. (2008). The nature of the beast: Organizational structures and the lethality of terrorist attacks. *Journal of Politics*, *70*(2), 437–449. [CrossRef]
Asongu, S. A. (2014). Financial development dynamic thresholds of financial globalization: Evidence from Africa. *Journal of Economic Studies*, *41*(2), 166–195. [CrossRef]
Asongu, S. A. (2016). Determinants of growth in fast developing countries: Evidence from bundling and unbundling institutions. *Politics and Policy*, *44*(1), 97–134. [CrossRef]
Asongu, S. A., & Biekpe, N. (2017). *Globalization and terror in Africa*. International Economics.
Asongu, S. A., Efobi, U., & Beecroft, I. (2015a). FDI, aid, terrorism: Conditional threshold evidence from developing countries. African Governance and Development Institute working paper no. 15/019, Yaoundé. [CrossRef]
Asongu, S. A., & Nwachukwu, J. C. (2017). The impact of terrorism on governance in African countries. *World Development*, *99*, 253–270. [CrossRef]
Asongu, S. A., & Tchamyou, S. V. (2018). The Role of knowledge Economy in Africa. *Journal of the Knowledge Economy*. [CrossRef]
Asongu, S. A., Tchamyou, V. S., Asongu, N., Asongu, N. P., & Tchamyou, N. P. (2018). Fighting terrorism in Africa: Benchmarking policy harmonization. *Physica. Part A*, *492*, 1931–1957. [CrossRef]
Atlas Narodov, M. (1964). *Moscow: Miklukho-Maklai Ethnological Institute at the Department of Geodesy and cartography of the state geological committee of the Soviet Union*.
Azam, J.-P., & Delacroix, A. (2006). Aid and the delegated fight against terrorism. *Review of Development Economics*, *10*(2), 330–344. [CrossRef]
Azam, J.-P., & Thelen, V. (2008). The roles of foreign aid and education in the war on terror. *Public Choice*, *135*(3–4), 375–397. [CrossRef]
Baltagi, B. H. (2008). Forecasting with panel data. *Journal of Forecasting*, *27*(2), 153–173. [CrossRef]
Bandyopadhyay, S., Sandler, T., & Younas, J. (2014). Foreign direct investment, aid, and terrorism. *Oxford Economic Papers*, *66*(1), 25–50. [CrossRef]
Basuchoudhary, A., & Shughart, W. F. (2010). On ethnic conflict and the origins of transnational terrorism. *Defence and Peace Economics*, *21*(1), 65–87. [CrossRef]
Blomberg, S. B., & Hess, G. D. (2008). The lexus and the olive branch: Globalization, democratization and terrorism. In P. Keefer & N. Loayza (Eds.), *Terrorism, economic development, and political openness* (pp. 116–147). Cambridge University Press.
Blum, M., Behle, D., & Huergo, L. (2011). *On the characteristics of a successful state: Good governance between the 1850s and the 1980s: A data envelopment approach* [Unpublished manuscript]. University of Tubingen.
Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115–143. [CrossRef]
Bond, S., Hoeffler, A., & Tample, J. (2001). *GMM estimation of empirical growth models*. University of Oxford.
Boylan, B. M. (2016). What drives ethnic terrorist campaigns? A view at the group level of analysis. *Conflict Management and Peace Science*, *33*(3), 250–272. [CrossRef]
Burgoon, B. (2006). On welfare and terror: Social welfare policies and political-economic roots of terrorism. *Journal of Conflict Resolution*, *50*(2), 176–203. [CrossRef]
Byman, D. (1998). The logic of ethnic terrorism. *Studies in Conflict and Terrorism*, *21*(2), 149–169. [CrossRef]
Campos, N. F., & Gassebner, M. (2009). *International terrorism, political instability and the escalation effect*. Discussion Paper 4061. IZA.
Cederman, L., Weidmann, N. B., & Gleditsch, K. S. (2011). Horizontal inequalities and ethno-nationalist civil war: A global comparison. *American Political Science Review*, *105*(3), 478–495. [CrossRef]
Cederman, L., Wimmer, A., & Min, B. (2010). Why do ethnic groups rebel? New data and analysis. *World Politics*, *62*(1), 87–119. [CrossRef]
Choi, S. W. (2022). Leader nationalism, ethnic identity, and terrorist violence. *British Journal of Political Science*, *52*(3), 1151–1167. [CrossRef]
Choi, S. W., & Piazza, J. A. (2016). Ethnic groups, political exclusion and domestic terrorism. *Defence and Peace Economics*, *27*(1), 37–63. [CrossRef]
Choi, S.-W., & Salehyan, I. (2013). No good deed goes unpunished: Refugees, humanitarian aid, and terrorism. *Conflict Management and Peace Science*, *30*(1), 53–75. [CrossRef]
Collier,P., & Garg, A. (1999). On kin groups and wages in the Ghanaian labour market. *Oxford Bulletin of Economics and Statistics*, *61*(2), 133–151. [CrossRef]
Collier, P., Hoeffler, A., & Rohner, D. (2009). Beyond greed and grievance: Feasibility and civil war. *Oxford Economic Papers*, *61*(1), 1–27. [CrossRef]
Cunningham, K. G., & Weidmann, N. B. (2010). Shared space: Ethnic groups, state accommodation, and localized conflict. *International Studies Quarterly*, *54*(4), 1035–1054. [CrossRef]
Easterly, W., & Levine, R. (1999). Africa's growth tragedy: Political and ethnic division. *Quarterly Journal of Economics*, *112*, 1202–1250.
Easterly, W., Ritzen, J., & Woolcock, M. (2006). Social cohesion, institution and growth. *Economics and Politics*, *18*(2), 103–120. [CrossRef]
Efobi, U., & Asongu, S. A. (2016). Terrorism and capital flight from Africa. *International Economics*, *148*, 81–94. [CrossRef]
Ewi, M., & Aning, K. (2006). Assessing the role of the African Union in preventing and combating terrorism in Africa. *African Security Review*, *15*(3), 32–46. [CrossRef]
Eyerman, J. (1998). Terrorism and democratic states: Soft targets or accessible systems. *International Interactions*, *24*(2), 151–170. [CrossRef]
Feridun, M., & Shahbaz, M. (2010). Fighting terrorism: Are military measures effective? Empirical evidence for Turkey. *Defence and Peace Economics*, *21*(2), 193–205. [CrossRef]
Foster, P. (2014). *Jihadists from around the world flock to fight with Isil; UN*. The Telegraph. http://www.telegraph.co.uk/news/worldnews/islamic-state/11200701/Jihadists-from-around-the-world-flock-to-fight-with-Isil-UN.html
Freytag, A., Krüger, J. J., Meierrieks, D., & Schneider, F. (2008). The origins of terrorism: Cross-country estimates on socio-economic determinants of terrorism. CIE Working Paper 2009-01, University of Paderborn.
Gaibulloev, K., & Sandler, T. (2009). The impact of terrorism and conflicts on growth in Asia. *Economics and Politics*, *21*(3), 359–383. [CrossRef]
Gurr, T. R. (1994). Peoples against the state: Ethno-political conflict and the changing world system. *International Studies Quarterly*, *38*(3), 347–377. [CrossRef]
Global Terrorism Index (GTI) (2014). *Global terrorism index: Measuring and understanding the impact of terrorism* (pp. 2–90). Institute for Economics and Peace. http://www.visionofhumanity.org/sites/default/files/Global%20Terrorism%20Index%20Report%202014_0.pdf
Hansen,H. E., Nemeth, S. C., & Mauslein, J. A. (2018). Ethnic political exclusion and terrorism: Analyzing the local conditions for violence. *Conflict Management and Peace Science*, *37*(3), 280–300. [CrossRef]
Hoffman, B. (2007). Radicalization, terrorism, and diasporas. In B. Hoffman, W. Rosenau, A. J. Curiel & D. Zimmerman (Eds.), *The radicalization of diasporas and terrorism: A joint conference by the RAND Corporation and the center for security studies* (pp. 1–4). ETH Zurich. RAND Corporation.
Horowitz, D. L. (1985). *Ethnic groups in conflict*. University of California Press.
Jensen, C., & Skaaning, S. -E. (2010). *Democracy, ethnic fractionalization, and the politics of social spending* (Unpublished manuscript). Aarhus University.

Kaniovski, S., & Mueller, D. C. (2006). Community size, heterogeneity and voter turnouts. *Public Choice*, *129*(3–4), 399–415. [CrossRef]
Kaufmann, D., Kraay, A., & Mastruzzi, M. (2008). Governance matters VII: Aggregate and individual governance indicators 1996–2007. Policy Research Working Paper 4654, World Bank. [CrossRef]
Krueger, A. B., & Laitin, D. (2008). Kto kgo? A cross-country study of the origins and targets of terrorism. In P. Keefer & N. Loayza (Eds.), *Terrorism, economic development, and political openness* (pp. 148–173). Cambridge University Press.
Krueger, A. B., & Malečková, J. (2003). Education, poverty and terrorism: There a causal connection? *Journal of Economic Perspectives*, *17*(4), 119–144. [CrossRef]
Kurrild-Klitgaard, P., Justesen, M. K., & Klemmensen, R. (2006). The political economy of freedom, democracy and transnational terrorism. *Public Choice*, *128*(1–2), 289–315. [CrossRef]
Lai, B. (2007). 'Draining the Swamp': An empirical examination of the production of international terrorism, 1968–1998. *Conflict Management and Peace Science*, *24*(4), 297–310. [CrossRef]
Li, Q. (2005). Does democracy promote or reduce transnational terrorist incidents? *Journal of Conflict Resolution*, *49*(2), 278–297. [CrossRef]
Lieberman, E. S. (2009). *Boundaries of contagion: How ethnic politics have shaped government responses to AIDS*. Princeton University Press.
Love, I., & Zicchino, L. (2006). Financial development and dynamic investment behaviour: Evidence from panel VAR. *Quarterly Review of Economics and Finance*, *46*(2), 190–210. [CrossRef]
Lum, C., Kennedy, L. W., & Sherley, A. J. (2006). The effectiveness of counter-terrorism strategies. A Campbell systematic review. *Crime and Justice*, *2*(2), 1–49.
MacEachern, S. (2000). Genes, tribes, and African history. *Current Anthropology*, *41*(3), 357–384. [CrossRef]
Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *Quarterly Journal of Economics*, *107*(2), 407–437. [CrossRef]
Masters, D. (2008). The origin of terrorist threats: Religious, separatist, or something else? *Terrorism and Political Violence*, *20*(3), 396–414. [CrossRef]
Mauro, P. (1995). Corruption and growth. *Quarterly Journal of Economics*, *110*(3), 681–712. [CrossRef]
McAllister, B., & Schmid, A. P. (2011). Theories of terrorism. In *The Routledge handbook of terrorism research* (pp. 201–293). Routledge.
Michalopoulos, S. (2008). *Ethnolinguistic diversity: Origin and implications*. Mimeo, Tufts University.
Montalvo, J. G., & Reynal-Querol, M. (2003). Religious polarization and economic development. *Economics Letters*, *80*(2), 201–210. [CrossRef]
Montalvo, J. G., & Reynal-Querol, M. (2005). Ethnic polarization, potential conflict, and civil wars. *American Economic Review*, *95*(3), 796–816. [CrossRef]
Nemeth, S. C., Mauslein, J. A., & Stapley, C. (2014). The primacy of the local: Identifying terrorist hot spots using geographic information systems. *Journal of Politics*, *76*(2), 304–317. [CrossRef]
Norris, P., Kern, M., & Just, M. R. (Eds.) (2003). *Framing terrorism: The news media, the government, and the public*. Psychology Press.
Piazza, J. A. (2007). Draining the swamp: Democracy promotion, state failure, and terrorism in 19 Middle Eastern states. *Studies in Conflict and Terrorism*, *30*(6), 521–539. [CrossRef]
Plümper, T., & Neumayer, E. (2010). The friend of my enemy is my enemy: International alliances and international terrorism. *European Journal of Political Research*, *49*(1), 75–96. [CrossRef]
Posner, D. N. (2004). Measuring ethnic fractionalization in Africa. *American Journal of Political Science*, *48*, 849–863. [CrossRef]
Putnam, R. D. (2007). E pluribus unum: Diversity and community in the twenty-first century The 2006 Johan Skytte Prize Lecture. *Scandinavian Political Studies*, *30*(2), 137–174. [CrossRef]
Python, A., Brandsch, J., & Tskhay, A. (2017). Provoking local ethnic violence–A global study on ethnic polarization and terrorist targeting. *Political Geography*, *58*, 77–89. [CrossRef]
Roodman, D. (2009a). A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics*, *71*(1), 135–158. [CrossRef]
Roodman, D. (2009b). How to do xtabond2: An introduction to difference and system GMM in Stata. *STATA Journal: Promoting Communications on Statistics and Stata*, *9*(1), 86–136. [CrossRef]
Sambanis, N. (2008.). Terrorism and civil war. In P. Keefer & N. Loayza (Eds.). *Terrorism, economic development, and political openness* (pp. 174–206). Cambridge University Press.
Sandler, T. (2005). Collective versus Unilateral Responses to Terrorism. In *Policy Challenges and Political Responses* (pp. 75–93). Springer. [CrossRef]
Straus, S. (2012). Wars do end. Changing patterns of political violence in sub-Saharan Africa. *African Affairs*, *111*(443), 179–201. [CrossRef]
Tan, C. M. (2010). No one true path: Uncovering the interplay between geography, institutions, and fractionalization in economic development. *Journal of Applied Econometrics*, *25*(7), 1100–1127. [CrossRef]
Tavares, J. (2004). The open society assesses its enemies: Shocks, disasters and terrorist attacks. *Journal of Monetary Economics*, *51*(5), 1039–1070. [CrossRef]
Tequame, M. (2010). HIV, risky behavior and ethno-linguistic heterogeneity (Unpublished working paper). Center for Research in the Economics of Development, University of Namur, Belgium.
Walker, K. L., & Chestnut, D. (2003). The role of ethno-cultural variables in response to terrorism. *Cultural Diversity and Ethnic Minority Psychology*, *9*(3), 251–262. [CrossRef]
Walter, E., & Sander, T. (2005). Transnational terrorism. 1968–2000: Thresholds, persistence, and forecasts. *Southern Economic Journal*, *71*(3), 467–482. [CrossRef]
Wilkinson, S. I. (2009). Riots. *Annual Review of Political Science*, *12*(1), 329–343. [CrossRef]

**Appendix**
*The List of the Sample of African Countries Used*

| Countries in Africa | | | | | |
|---|---|---|---|---|---|
| Algeria | Comoros | Gambia, The | Mali | Seychelles | Zambia |
| Angola | Congo, Dem. Rep. | Ghana | Mauritania | Sierra Leone | Zimbabwe |
| Benin | Congo, Rep. | Guinea | Morocco | Somalia | |
| Botswana | Cote d'Ivoire | Guinea-Bissau | Mozambique | South Africa | |
| Burkina Faso | Djibouti | Kenya | Namibia | Sudan | |
| Burundi | Egypt, Arab Rep. | Lesotho | Niger | Swaziland | |
| Cameroon | Equatorial Guinea | Liberia | Nigeria | Tanzania | |
| Cape Verde | Eritrea | Libya | Rwanda | Togo | |
| Central African Republic | Ethiopia | Madagascar | Sao Tome and Principe | Tunisia | |
| Chad | Gabon | Malawi | Senegal | Uganda | |