A G D I Working Paper

WP/19/023

Natural Resource Exports, Foreign Aid and Terrorism

Forthcoming: International Journal of Development and Conflict

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January 2018

Abstract

Linkages between foreign aid, terrorism and natural resource (fuel and iron ore) exports are investigated in this study. The focus is on 78 developing countries with data for the period 1984 to 2008. The generalised method of moment is employed as empirical strategy. Three main foreign aid variables are used for the analysis, namely: bilateral aid, multilateral aid and total aid. The corresponding terrorism variables employed are: domestic terrorism, transnational terrorism, unclear terrorism and total terrorism. The following findings are established. First, the criteria informing the validity of specifications corresponding to iron ore exports do not hold. Second, there is evidence of convergence in fuel exports. Third, whereas the unconditional impacts of aid dynamics are not significant, the unconditional impacts of terrorism dynamics are consistently positive on fuel exports. Fourth, the interaction between terrorism and aid dynamics consistently display negative signs, with corresponding modifying aid thresholds within respective ranges. Unexpected signs are elicited and policy implications discussed. Given the unexpected results, an extended analysis is performed in which net effects are computed. These net effects are constitutive of the unconditional effect from terrorism and the conditional impacts from the interaction between foreign aid and terrorism dynamics. Based on the extended analysis, bilateral aid and total aid modulate terrorism dynamics to induce net positive effects on fuel exports while multilateral aid moderates terrorism dynamics to engender negative net effects on fuel exports. The research improves extant knowledge on nexuses between resources, terrorism and foreign aid.

JEL Classification: F40; F23; F35; Q34; O40

Keywords: Foreign Aid; Exports; Natural Resources; Terrorism; Economic Development

1. Introduction

The 2015 report on the Global Peace Index (GPI) has shown that approximately thirteen per cent of the world's Gross Domestic Product (GDP) is wasted on expenditures linked to violence (Asongu and Kodila-Tedika 2017a, Anderson 2015). In essence about 14.3 trillion USD corresponding to 13.4% of the world's GDP in 2014 was used to curtail policy syndromes such as violent crime and political strife. The underlying expenditure represents the combined annual wealth or GDP of some major countries, namely: Spain, Canada, France, Brazil, Germany and the United Kingdom. According to the report, most of the documented violence is terrorism-oriented. Moreover, the positive trend is expected to grow in the near future. This is essentially because terrorism networks have been expanding significantly with respect to their scopes of operation, representing approximately 61% more killings in 2014 from a 2008 base year. It is important to note that a significant proportion of terrorists' activities are traceable to developing countries. Moreover, corresponding externalities of poverty have also been growing substantially, particularly because since World War 2, 2014 is the year that registered the record number of internally displaced persons[1].

Against the above background, a significant bulk of the literature has been devoted to understanding the channels by which crimes, conflicts, terrorism and political strife can be mitigated (Asongu and Kodila-Tedika 2017a). To this end, a plethora of instruments have been documented, notably: Bell et al. (2014) articulate the relevance of transparency while Choi (2010) is concerned with the policy channel of the rule of law. Brockhoff *et al.* (2015) provide insights into education instruments, which is consistent with the perspective of Costa et al. (2008) and Asongu and Nwachukwu (2016a) who have respectively focused on bilingualism and lifelong learning. Hoffman *et al.* (2013) is concerned with freedom of the press and publicity whereas Asongu and Kodila-Tedika (2016) conclude that corruption-control is the most relevant weapon in the fight against conflicts/crimes. Gardner (2007) and Feridun and Shahbaz (2010) respectively focus on behavrioural factors and military power.

Asongu and Nwachukwu (2016b) analyse the relevance of harmonizing policy in the prevention of tensions of socio-political nature that fuelled the 2011 Arab Spring while a more contemporary strand of literature has been concerned with governance, military expenditure and inclusive mechanisms by which terrorism can be curtailed (Asongu and

[1] It should be noted that, the mid-April 2015 publication of a report by the World Bank pertaining to World Development Indicators showed that most developing countries did not achieve the Millennium Development Goals (MDGs) extreme poverty target (Caulderwood 2015, World Bank 2015, Asongu and Kodila-Tedika 2017b).

Nwachukwu 2016b; Asongu *et al*. 2017; Asongu and Nwachukwu 2018; Asongu *et al*. 2018a; Asongu *et al*. 2018b, 2018c).

Another strand of the literature has been oriented towards nexuses between violence, political instability, terrorism and macroeconomic outcomes. Abadie and Gardeazabal (2008) have investigated the effect of terrorism on external flows within the framework of foreign direct investment (FDI) while Bandyopadhyay *et al*. (2014) are concerned with the relevance of development assistance in moderating the impact of terrorism on FDI: an analysis which is extended by Efobi *et al*. (2018) and Asongu *et al*. (2015) with respectively, contingencies on corruption-control and existing levels of FDI. Gries et al. (2011), Shahbaz *et al*. (2013) and Shahzad *et al*. (2016) have provided evidence of bi-directional causality between terrorism and economic growth, while Piazza (2006) and Choi, (2015) conclude that the causality direction is from economic growth to terrorism. Conversely, according to Gaibulloev and Sandler (2009), Öcal and Yildirim (2010) and Meierrieks and Gries (2013), the underlying causality runs from terrorism to economic growth. Koh (2007) focus on the nexus between innovation and terrorism whereas Humphreys (2005) is concerned with how natural resources interplay with terrorism. This research complements that attendant literature by focusing on how foreign aid can be used to modulate the potentially unfavourable effect of terrorism on exports of two natural resources, namely: iron ore and fuel.

Following Asongu and Kodila-Tedika (2017a), documented studies pertaining to the terrorism-trade relationship can be engaged along three main strands, namely: the effect of terrorism on trade, causality from trade to terrorism and concerns arising from modelling the underlying nexus. First, with regard to the effect of terrorism on trade: post-9/11[2] security measures, put in place to mitigate the negative incidence of terrorism on world trade have been documented by Richardson (2004). The relevance of welfare and terrorism is assessed by Nitsch and Schumacher (2004) from 1960 to1993 in 200 countries by means of an augmented gravity model. Employing a multitude of indicators on violence, terrorism and bilateral trade, they have concluded that terrorism reduces trade openness. The findings show that doubling terrorism incidents reduces bilateral trade by approximately 4%. (3) The interplay between closeness to the origin of terrorism and corresponding negative spillovers on trade openness has been investigated by De Sousa *et al*. (2009a) to establish the following: (i) the need for a theory that clarifies the nexuses between policies of security, trade and transnational terrorism to be carefully worked-out; (ii) imperative for more robust

[2] 9/11 refers to the September 11th 2001 terrorists attacks in the United States of America (USA).

examinations of terrorism externalities pertaining to neighbouring relationships and incidents. De Sousa *et al*. (2009b) have extended the analysis by assessing the effect of the diffusions of terrorism at the international level on trade and security outcomes. The empirical model is motivated by the assumption that nearness to the origin of terrorism bears a significant nexus with the corresponding externalities of terrorism. The basic idea underpinning the study is that, indicators of security which negatively affect trade influence the country from which terrorism originates and neighbouring countries simultaneously. On the contrary, countries located much further from the country which is the source of terror could positively benefit from trade openness by getting some compensation for the loss in trade by countries close to the origin of terror. The corresponding results show: (i) a direct negative incidence on international trade from transnational terrorism; (ii) an indirect unfavourable effect from terrorism to neighbouring countries of the source of terror and (iii) trade increases with remoteness of terrorism.

Second, with regard to the role of trade openness on terrorism, the sparse literature on the relationship has substantially been oriented towards the commercialisation of illegal commodities. (1) Based on the controversial underpinning that terrorism is fuelled by 'illicit drugs' trade, Piazza (2011) has investigated the nexuses surrounding drugs trade and terrorism dynamics to reach the conclusion that domestic and international terrorism are substantially fuelled by cocaine production, the commercialisation of opiate and cultivation of illicit drugs. Conversely, crop eradication and the ban of drugs have effects that are opposite. Piazza (2011) further extends the findings by assessing the nexus between terrorism and 'opium trade' in Afghanistan, employing binomial regressions and focusing on 24 Afghan provinces using data for the period 1996-2008. The author establishes that provinces with substantial opium production are equally associated with high incidences of attacks and causalities. Hence, the direction of causality is concluded to be flowing from the production of opium to terror incidents.

The third strand on the modelling issues has been clearly documented by Mirza and Verdier (2008) from a survey of the literature. They conclude by presenting four main pitfalls from empirical studies pertaining to the nexus between terrorism and trade openness, notably, the imperative of: (a) accounting for omitted variables which are obviously linked to terrorism and trade; (b) acknowledging that terrorism is persistent over time; (c) distinguishing between the impacts of incidental country-specific cases from the effect of occurrences that relate to the source-country and (d) accounting for endogeneity.

Noticeably, the engaged literature can be improved from at least four main perspectives, namely, the need to: (i) take on board more dimensions of terrorism, (ii) explore the interplay of a foreign policy variable in the nexus between trade openness and terrorism, (iii) engage trade-specific elements in the relationship and (iv) adopt a modelling approach that accounts for endogeneity. First, there is a caution from Choi (2015) on the importance of engaging a multitude of indicators when examining interactions between factors of terrorism and macroeconomic outcomes. Consistent with this literature, a stream of recent studies has considered a multitude of terrorism variables, namely: dynamics of domestic, unclear, transnational and total terrorism (Efobi *et al.* 2015, Asongu *et al.* 2015, Asongu and Kodila-Tedika 2017a). Therefore, this research follows this stream of studies in adopting the underlying terrorism dynamics. Hence, this study departs from the attendant terrorism-trade studies that have focused exclusively on either transnational or domestic terrorism (De Sousa *et al.* 2009a, 2009b; Piazza 2011).

Second, in an effort to improve room for policy implications, we are consistent with a stream of the research that has used development assistance as a moderator of the incidence of terrorism on macroeconomic variables (Bandyopadhyay *et al.* 2014, Efobi *et al.* 2015). Therefore, this research departs from the discussed trade-terrorism studies by engaging an interactive indicator of foreign aid as a policy variable. In addition, motivated by the recommendation of Choi (2015) on the relevance of taking more policy variables on board, this research uses three foreign aid variables, namely: bilateral aid, multilateral aid and total aid. Consistent with the established exploratory insights from Richardson (2014) and empirical constructs from De Sousa *et al.* (2009a, 2009b) which support the evidence that terrorism mitigates trade openness; the intuition for assessing if foreign aid can dampen the hypothetically negative terrorism-trade relationship is sound.

Third, it is important to lay emphasis on specific trade commodities. Hence, contrary to the bulk of engaged literature above and more recently Asongu and Kodila-Tedika (2017a), we narrow the perspective from the broad measurement of trade to natural resource exports, notably: iron ore and fuel exports. Emphasis on natural resources builds on the fundamental role of natural resources in driving economic prosperity in developing countries over the past decaded (Amavilah 2015). Hence, by employing specific export indicators, we are consistent with Piazza (2011, 2012) and not in accordance with Nitsch and Schumacher (2004), Richardson (2004) and De Sousa *et al.* (2009a, 2009b).

Fourth, Mirza and Verdier (2008) in a survey have cautioned that empirical studies should take the concern of endogeneity into account when assessing interactions between dynamics of terrorism and macroeconomic outcomes. In the light of the underpinning caution, this research models the interaction with the Generalized Method of Moments (GMM) which accounts for endogeneity from a multitude of fronts, notably by: controlling for simultaneity using internal instruments and accounting for the unobserved heterogeneity through time-invariant omitted variables (Love and Zicchino 2006, Baltagi 2008, Roodman 2009a, 2009b, Asongu and Kodila-Tedika 2017a, Tchamyou *et al.* 2019).

Knowledgeable of the above background, the present study focuses on investigating if and how development assistance can mitigate the potentially unfavourable incidence of terrorism on the export of natural resources. The temporal and geographical scopes are respectively, 1984 to 2008 and 78 developing countries. The focus of the research on the underlying periodicity and developing countries builds on three main motivations. First, as maintained by Gaibulloev and Sandler (2009), the unappealing macroeconomic impacts from terrorism are comparatively more apparent in developing countries vis-à-vis their developed counterparts because the former countries are lacking in logistical, financial and technological capacities. These capacities are essential in the absorption of the negative externalities associated with terrorists' activities. Second, development assistance flows to developing countries from developed countries. Hence, the objective of employing a foreign aid policy variable is consistent with an analytical scope of developing nations. Third, this research is also motivated by the need to compare the findings of this study with those that have engaged the same dataset and for the same periodicity, notably: Bandyopadhyay *et al.* (2014), Asongu *et al.* (2015) and Efobi *et al.* (2018). As emphasised above, the underlying comparative studies have focused on investigating how development assistance can be relevant in hedging the potentially unfavourable incidence of terrorism on FDI.

Consistent with the underlying literature which has focused on associations between terrorism and macroeconomic outcomes (Asongu *et al.* 2015, Asongu and Kodila-Tedika 2017a, Efobi *et al.* 2018), the theoretical underpinnings underlying the interaction between terrorism and macroeconomic outcomes build on the Conflict Management Model (CMM) of Thomas-Kilmann (1992) and the Social Control Theory (SCT) from Black (1990). Accordingly, the documented theoretical underpinnings by Akinwale (2010: 125) are also in line with research on conflict management (Borg 1992, Volkema and Bergmann 1995). These theoretical postulations are relevant to this research in the perspective that the moderating

proxy of foreign aid can be used to maintain an environment that is conducive to the hedging of terrorism. Accordingly, government expenditure needed for the fight terrorism is boosted by foreign aid (Gaibulloev and Sandler 2009) and development assistance can also be vital in increasing consolidating channels that have documented to limite the unfavourable incidences of political strife and terrorism, notably, the rule of law and education (Heyneman 2002, Beets 2005, Heyneman 2008a, 2008b, Oreopoulos and Salvanes 2009, Asongu and Nwachukwu 2016a).

The remainder of the research is organised in the following manner. The introduction is followed by a Data and Methodology section which clarifies the geographical and temporal scopes of the study as well as the empirical strategy employed to assess the importance of foreign aid in moderating the incidence of terrorism on trade openness. The Empirical results section discloses the findings while the research concludes in the last section with implications and further research directions.

2. Data and Methodology

2.1 Data

Building on the motivation of this study, the geographical and temporal scopes of the research are respectively 78 developing nations and 1984 to 2008. The justifications for these scopes have already been discussed in the preceding section. Moreover, in order to avoid the influence of outliers, not all developing countries are involved in the sample. Accordingly, following Bandyopadhyay *et al.* (2014) and Efobi *et al.* (2018), Palestine, Western Gaza, Iraq and Afghanistan are not involved in the sample[3]. The corresponding data is made up of three year non-overlapping intervals. The purpose of involving data averages is primarily to reduce short term disturbances that may considerably loom.

The two outcome variables employed in the research are fuel and iron ore exports while four terrorism proxies are used, namely: dynamics of domestic, unclear, transnational and total terrorism (Asongu and Kodila-Tedika 2017a). The corresponding three foreign aid

[3] The adopted countries include: Albania, Costa Rica, India, Namibia, Syria, Algeria, Cote d'Ivoire, Indonesia, Nicaragua, Tanzania, Angola, Dominican Republic, Iran, Niger, Thailand, Argentina, Ecuador, Jamaica, Nigeria, Togo, Bahrain, Egypt, Jordan, Pakistan, Trinidad and Tobago, Bangladesh, El Salvador, Kenya, Panama, Tunisia, Bolivia, Ethiopia, Lebanon, Papua New Guinea, Turkey, Botswana, Gabon, Libya, Paraguay, Uganda, Brazil, Gambia, Madagascar, Peru, Uruguay, Burkina Faso, Ghana, Malawi, Philippines, Venezuela, Cameroon, Guatemala, Malaysia, Saudi Arabia, Vietnam, Chile, Guinea, Mali, Senegal, Yemen, China, Guinea-Bissau, Malta, Sierra Leone, Zambia, Colombia, Guyana ,Mexico, South Africa, Zimbabwe, Congo, D. Republic, Haiti, Morocco, Sri Lanka, Congo Republic, Honduras, Mozambique and Sudan.

indicators are: multilateral aid, bilateral aid and total aid. The adopted elements in the conditioning information set are: *internal conflicts, political globalisation, inflation, infrastructure, exchange rate and trade openness*. The choice of these indicators in the conditioning information set is motivated by contemporary terrorism literature (Bandyopadhyay *et al*. 2014, Efobi and Asongu 2016, Asongu and Biekpe 2018, Asongu and Amankwah-Amoah 2018). It is expected that trade openness, better infrastructure and improvements in exchange rate will have a positive incidence on the exports of resources (Akpan 2014, Asongu 2015a). Coversely, civil/internal conflicts and growing prices or inflation should engender opposite incidences on the outcome variables. In essence, Rodrik (2008) documents that a high rate of exchange stimulate exports. Furthermore, chaotic inflation is likely to diminish the volume of trade given that it is associated with more uncertainty in economic activities. In essence, as recently documented by Kelsey and le Roux (2017, 2018), investors prefer engaging with macroeconomic environments that are characterised with reduced ambiguity. It is difficult to establish the expected incidence of political globalisation because its impact is substantially contingent on some influence in 'decision making' at the international level (Asongu 2014a). We provide definitions for the discussed variables in Table 1. Accordingly, in order to address concerns pertaining to the positive skew of the terrorism data, the terrorism indicators are log-normalized in accordance with contemporary literature (Bandyopadhyay *et al*. 2014, Efobi and Asongu 2016, Asongu and Biekpe 2018, Asongu and Amankwah-Amoah 2018).

In the apparent from Table 2 which discloses the summary statistics that, from the perspective of mean values, the engaged variables can be compared. Moreover, in the light of corresponding standard deviations, the research can be confident that significant estimated coefficients will be derived from the empirical analysis. The correlation matrix in Table 3 is designed to tackle issues pertaining to multicollinearity in the independent variables of interest. The resulting concerns in foreign aid variables are addressed by employing the foreign aid dynamics in distinct specifications.

Table 1: Definitions and sources of variables

Variables	Signs	Definitions	Sources
Fuel Export	FuelExp	Ln. Fuel Export (as a % of Merchandise Export)	Bandyopadhyay *et al.* (2014) and Efobi *et al.* (2015)
Iron Ore Export	IOExp	Ln. Iron Ore Export (as a % of Merchandise Export)	
Trade Openness	LnTrade	Ln. of Exports plus Imports of Commodities (% of GDP)	
Infrastructure	LnTel	Ln. of Number of Telephone lines (per 100 people)	
Inflation	LnInflation	Ln. of Consumer Price Index (% of annual)	
Exchange rate	LnXrate	Ln. of Exchange rate (local currency per USD)	
Bilateral Aid	LnBilaid	Ln. of Bilateral aid, net disbursement (million USD)	
Multilateral Aid	LnMulaid	Ln. of Multilateral aid, net disbursement (million USD)	
Total Aid	LnTotaid	Ln. of Total aid, net disbursement (million USD)	
Domestic terrorism	Domter	Number of Domestic terrorism incidents	
Transnational terrorism	Tranater	Number of Transnational terrorism incidents	
Unclear terrorism	Unclter	Number of terrorism incidents whose category in unclear	
Total terrorism	Totter	Total number of terrorism incidents	
Political globalisation	LnPolglob	Ln. of Index of political globalisation	
Internal conflicts	Civcon	Index of internal civil conflicts	

GDP: Gross Domestic Product. WDI: World Development Indicators.

Table 2: Summary statistics

	Mean	S.D	Minimum	Maximum	Obs
Fuel Export (ln)	1.007	2.785	-11.366	4.585	503
Iron Ore Export (ln)	0.698	2.120	-10.495	4.486	511
Trade Openness (ln)	4.118	0.534	2.519	5.546	612
Infrastructure (ln)	1.475	1.017	0.091	4.031	616
Inflation (ln)	2.414	1.384	-3.434	9.136	581
Exchange rate (ln)	2.908	3.870	-22.121	21.529	618
Bilateral Aid (ln)	5.181	1.286	0.765	8.362	602
Multilateral Aid (ln)	4.163	1.518	-1.249	7.105	600
Total Aid (ln)	5.550	1.276	0.800	8.495	608
Domestic terrorism	14.292	45.179	0	419.33	624
Transnational terrorism	2.316	6.127	0	63	624
Unclear terrorism	1.972	7.479	0	86	624
Total terrorism	18.581	55.595	0	477.66	624
Political globalisation (ln)	4.036	0.301	2.861	4.530	624
Internal conflicts	0.965	1.906	0	10	615

S.D: Standard Deviation. Obs: Observations.

Table 3: Correlation Matrix

LnFuelExp	LnIOExp	LnTrade	LnTel	LnInflation	LnXrate	LnBilad	LnMulaid	LnTotaid	Domter	Tranater	Unclter	Totter	LnPolglob	Civcon	
1.000	-0.067	-0.106	0.095	0.016	-0.002	0.230	-0.090	-0.007	0.044	0.066	0.013	0.044	0.207	0.043	LnFuelExp
	1.000	0.103	0.080	-0.001	-0.055	0.126	0.025	0.093	0.049	0.0007	-0.001	0.040	0.109	-0.079	LnIOExp
		1.000	0.296	-0.230	0.043	-0.267	-0.289	-0.282	-0.236	-0.206	-0.240	-0.246	-0.122	-0.299	LnTrade
			1.000	-0.121	-0.191	-0.376	-0.514	-0.450	0.023	0.072	-0.003	0.026	0.268	-0.183	LnTel
				1.000	-0.284	-0.047	-0.023	-0.039	0.171	0.164	0.091	0.169	-0.150	0.185	LnInflation
					1.000	0.114	0.183	0.144	-0.081	-0.001	-0.050	-0.073	0.089	-0.120	LnXrate
						1.000	**0.721**	**0.970**	0.116	0.088	0.093	0.117	0.233	0.259	LnBilaid
							1.000	**0.833**	0.014	-0.039	0.069	0.016	0.167	0.194	LnMulaid
								1.000	0.093	0.059	0.094	0.094	0.227	0.255	LnTotaid
									1.000	**0.743**	**0.733**	**0.993**	0.127	0.428	Domter
										1.000	**0.528**	**0.785**	0.120	0.418	Tranater
											1.000	**0.789**	0.072	0.347	Unclter
												1.000	0.126	0.441	Totter
													1.000	-0.024	LnPolglob
														1.000	Civcon

LnFuelExp: Fuel Export. LnIOExp: Iron Ore Export. LnTrade: Trade Openness. LnTel: Number of Telephone lines. LnXrate: Exchange rate. LnBilaid: Bilateral aid. LnMulaid: Multilateral aid. LnTotaid: Total aid. Domter: Number of Domestic terrorism incidents. Tranater: Number of Transnational terrorism incidents. Unclter: Number of terrorism incidents whose category in unclear. Totter: Total number of terrorism incidents. LnPolglob: Index of political globalisation. Civcon: Index of internal civil conflicts.

2.2 Methodology

Following the underpinning terrorism literature motivating the study (Asongu and Kodila-Tedika 2017a; Efobi *et al.* 2018), a *two-step* GMM empirical strategy is adopted for the study. The corresponding GMM approach which is an extension of Arellano and Bover (1995) by Roodman (2009a, 2009b) has been established to produce comparatively better estimates, relative to less contemporary *difference* and *system* GMM approaches that are not based on forward orthogonal deviations (Love and Zicchino 2006, Baltagi 2008, Tchamyou 2019a, 2019b, Asongu and Nwachukwu 2016c, 2016d). Moreover, there is an option with which to limit instrument proliferation when employing the estimation technique (Tchamyou and Asongu 2017; Boateng *et al.* 2018). This endogeneity-robust empirical strategy is in accordance with the engaged literature in the introduction because exports have also been established to have an incidence on terrorism (Piazza 2011, 2012)[4].

The following equations in levels (1) and first difference (2) summarize the standard system GMM estimation procedure.

$$R_{i,t} = \sigma_0 + \sigma_1 R_{i,t-\tau} + \sigma_2 F_{i,t} + \sigma_3 T_{i,t} + \sigma_4 FT_{i,t} + \sum_{h=1}^{6} \delta_h W_{h,i,t-\tau} + \eta_i + \xi_t + \varepsilon_{i,t} \quad (1)$$

$$\begin{aligned} R_{i,t} - R_{i,t-\tau} = {} & \sigma_1 (R_{i,t-\tau} - R_{i,t-2\tau}) + \sigma_2 (F_{i,t} - F_{i,t-\tau}) + \sigma_3 (T_{i,t} - T_{i,t-\tau}) \\ & + \sigma_4 (FT_{i,t} - FT_{i,t-\tau}) + \sum_{h=1}^{6} \delta_h (W_{h,i,t-\tau} - W_{h,i,t-2\tau}) + (\xi_t - \xi_{t-\tau}) + (\varepsilon_{i,t} - \varepsilon_{i,t-\tau}) \end{aligned} \quad (2)$$

where, $R_{i,t}$ is either 'fuel exports' or 'iron ore exports' of country i in period t; α is a constant; τ represents the coefficient of autoregression which is one in the study; F, represents Foreign aid; Terrorism is denoted with T; FT, reflects the interaction between Terrorism (*T*) and Foreign aid (*F*); the conditioning information set which is represented with W entails the set of control variables (*trade openness, internal conflicts, exchange rate, infrastructure, inflation* and *political globalisation*); η_i is the country-specific effect, ξ_t is the time-specific constant and $\varepsilon_{i,t}$ the error term. In the specification, we prefer the *two-step* to the *one-step* procedure because it is heteroscedasticity-consistent.

Given that the estimation technique involves interactive variables, it is worthwhile for the research to briefly engage some pitfalls documented in Brambor *et al.* (2006). The authors

[4] In addition, the endogeneity issue is also apparent from political cycles of violence and non-violence in political strife (Singh 2001, 2007).

recommend that the specifications should involve all constitutive variables in the specifications. Moreover, for the estimations to have economic meaning and by extension make economic sense, the interactive estimated coefficients should be interpreted in terms of conditional or marginal incidences. In essence, the foreign aid or moderating proxy should be established within the ranges that are disclosed in the summary statistics.

The identification strategy is such that the outcome variables are iron ore and fuel exports, the strictly exogenous variables are years while the endogenous explaining or predetermined variables are the independent variables of interest (i.e. foreign aid and terrorism dynamics) and variables in conditioning information set. This identification strategy which broadly follows insights from contemporary research (Love and Zicchino 2006, Dewan and Ramaprasad 2014, Asongu and De Moor 2017) is also consistent with Roodman (2009b) who has posited that years are arguably relevant strictly exogenous variables because they cannot be endogenous after a first difference.

The criterion used to assess the validity of exclusion restrictions is the Difference in Hansen Test (DHT) of instrument exogeneity whose null hypothesis should not rejected in order for the exclusion restrictions assumption to hold. The corresponding exclusion restriction assumption is that the identified strictly exogenous indicators influence the outcome indicators exclusively via the mechanisms represented by the endogenous explaining variables. This criterion is broadly consistent with less contemporary instrumental variables approaches which require that the null hypothesis of the Sargan/Hansen test should not be rejected in order for the exclusion restrictions to be valid (Beck *et al*. 2003, Asongu and Nwachukwu 2016e).

3. Empirical results

3.1 Conditional and unconditional effects

Tables 4 shows findings on linkages between natural resource exports, bilateral aid and terrorism, the focus of Table 5 is on nexuses between natural resource exports, multilateral aid and terrorism dynamics while Table 6 completes the presentation of results by providing the corresponding findings pertaining to the associations between natural resource exports, total aid and terrorism. Each table is characterised by four specifications, which respectively relate to domestic terrorism, transnational terrorism, unclear terrorism and total terrorism (in this order). Moreover, tables' in left-hand side (LHS) show "fuel exports"-oriented specifications while those in of the right-hand side (RHS) are linked to iron ore exports. In accordance with

the underlying comparative literature, four main information criteria are used to examine the validity of models[5].

The following findings are apparent from Table 4. First, the criteria of information which is relevant in assessing the validity of models do not consistently hold across specifications on the RHS corresponding to the exports of iron ore. This is essentially because the AR(2) in difference is significant, implying the presence of second order autocorrelation in difference. Second, terrorism consistently increases fuel exports, with the following order of increasing relevance in magnitude: total terrorism (0.006), domestic terrorism (0.007), transnational terrorism (0.041) and unclear terrorism (0.042). Third, the effect of aid on fuels exports is consistently not positively significant. Fourth, the interactions between bilateral aid and terrorism consistently display negative marginal effects on fuel exports. Moreover, the modifying thresholds for which the effect becomes negative are within the range (0.765 to 8.362) of bilateral aid provided by the summary statistics, notably: 7.000 (0.007/0.001) for domestic terrorism; 2.000 (0.014/0.007) for transnational terrorism; 5.250 (0.042/0.008) for unclear terrorism and 6.000 (0.006/0.001) for total terrorism. Fifth, some evidence of convergence is apparent in fuel exports. According to the supporting information criterion, the absolute value of the corresponding lagged endogenous variable is between 0 and 1[6]. This implies that countries with low fuel exports are catching-up countries with higher levels of fuel exports.

In Table 5, the following conclusions can be drawn. First, consistent with Table 4, the relevant information criteria for models' validity do not consistently hold across specifications on the RHS corresponding to iron ore exports, notably because the second order autocorrelation test in difference for the absence of autocorrelation is significant. Second, with the exception of unclear terrorism, the effect of terrorism on the dependent variable on the LHS is positive, with the following order of increasing relevance in magnitude: total terrorism (0.001), domestic terrorism (0.002) and transnational terrorism (0.011). It should be

[5] "*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 should not be rejected. Second the Sargan and Hansen over-identification restrictions (OIR) tests should not be significant because their null hypotheses are the positions that instruments are valid or not correlated with the error terms. In essence, while the Sargan OIR test is not robust but not weakened by instruments, the Hansen OIR is robust but weakened by instruments. In order to restrict identification or limit the proliferation of instruments, we have ensured that instruments are lower than the number of cross-sections in most specifications. Third, the Difference in Hansen Test (DHT) 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*" (Asongu& De Moor, 2017, p.200).

[6] We do not elaborate on the criterion of convergence for brevity, lack of space and interest of remaining consistent with the line of inquiry. The interested reader can find more insights into this criterion from recent convergence literature (Asongu 2014b, Asongu and Nwachukwu 2016b).

noted that the order of increasing magnitude is broadly consistent with the findings in Table 4. Third, in line with Table 4, the effect of aid on fuels exports is consistently not positively significant. Fourth, the interactions between terrorism and multilateral aid display negative marginal effects on fuel exports. In addition, the modifying thresholds for which the effect becomes negative are within the range (-1.249 to 7.105) of multilateral aid disclosed in the summary statistics, notably: 2.000 (0.002/0.001) for domestic terrorism; 2.750 (0.011/0.004) for transnational terrorism and 1.111 (0.001/0.0009) for total terrorism. While the interaction of multilateral aid with unclear terrorism is significant, we do not provide the corresponding modifying thresholds because the underlying incidence of unclear terrorism on the export of fuel is insignificant. Fifth, in accordance with Table 4, there is evidence of convergence in fuel exports. Sixth, most of the significant control variables display the expected signs: (i) the positive sign of internal/civil conflicts is consistent with those of terrorism dynamics and (ii) political globalisation positively influences resources exports (Rudra and Jensen 2011).

In Table 6, the following findings are apparent. First, in line with Tables 4-5, the information criteria for the validity of models do not consistently hold across specifications on the RHS. Second, with the exception of transnational terrorism, the effect of terrorism on the dependent variable on the LHS is positive, with the following order of increasing relevance in magnitude: total terrorism (0.007), domestic terrorism (0.008) and unclear terrorism (0.048). It should be noted that, the order of increasing magnitude is broadly consistent with those established in Tables 4-5. Third, consistent with Tables 4-5, the impact of total aid on fuel exports is consistently not positively significant. Fourth, the interactions between terrorism and total aid reveal negative marginal effects on fuel exports. Moreover, the modifying thresholds for which the effects become negative are within the acceptable range of total aid (i.e. 0.800 to 8.495) disclosed in the summary statistics, notably: 8.000 (0.008/0.001) for domestic terrorism; 6.000 (0.048/0.008) for unclear terrorism and 7.000 (0.007/0.001) for total terrorism. Fifth, consistent with Tables 4-5, there is evidence of convergence in fuel exports. Sixth, most of the significant control variables display the expected signs. Moreover, further to the signs of internal conflicts and political globalisation already discussed, the sign of inflation is negative as expected.

Table 4: Resources, Bilateral aid and Terrorism

	Fuel Export (ln)				Iron Ore Export (ln)			
	Domter	Tranater	Unclter	Totter	Domter	Tranater	Unclter	Totter
Constant	-2.026	-4.171	-5.857	-2.631	-2.754	-2.048	-3.759	**-3.381***
	(0.581)	(0.246)	(0.158)	(0.471)	(0.178)	(0.334)	(0.110)	**(0.098)**
Fuel (ln) (-1)	**0.794*** **	**0.797*** **	**0.755*** **	**0.790*** **	---	---	---	---
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**				
Ore & Iron (ln)(-1)	---	---	---	---	**0.926*** **	**0.840*** **	**0.935*** **	**0.931*** **
					(0.000)	**(0.000)**	**(0.000)**	**(0.000)**
Domestic T. (Domter)	**0.007** **	---	---	---	**-0.003***	---	---	---
	(0.015)				**(0.060)**			
Transnational T. (Tranater)	---	**0.041***	---	---	---	-0.030	---	---
		(0.072)				(0.196)		
Unclear T. (Unclter)	---	---	**0.042** **	---	---	---	-0.016	---
			(0.026)				(0.564)	
Total T. (Totter)	---	---	---	**0.006*** **	---	---	---	-0.001
				(0.009)				(0.221)
Bilateral Aid (LnBilaid)	0.022	0.030	0.071	0.033	-0.031	-0.030	-0.003	-0.017
	(0.783)	(0.678)	(0.372)	(0.678)	(0.471)	(0.407)	(0.935)	(0.648)
Domter × LnBilaid	**-0.001*** **	---	---	---	0.0003	---	---	---
	(0.005)				(0.199)			
Tranater × LnBilaid	---	**-0.007***	---	---	---	0.004	---	---
		(0.074)				(0.257)		
Unclter × LnBilaid	---	---	**-0.008*** **	---	---	---	0.001	---
			(0.007)				(0.771)	
Totter × LnBilaid	---	---	---	**-0.001*** **	---	---	---	0.0001
				(0.003)				(0.513)
LnTrade	0.198	0.299	0.481	0.277	-0.043	-0.235	0.015	-0.031
	(0.604)	(0.384)	(0.215)	(0.458)	(0.804)	(0.151)	(0.932)	(0.851)
LnInflation	-0.106	-0.088	-0.086	-0.107	-0.0003	-0.025	-0.012	-0.004
	(0.131)	(0.128)	(0.145)	(0.116)	(0.992)	(0.435)	(0.719)	(0.985)
LnInfrastructure	0.074	0.122	0.149	0.075	-0.069	-0.074	-0.044	-0.060
	(0.479)	(0.274)	(0.180)	(0.475)	(0.106)	(0.189)	(0.373)	(0.164)
LnXrate (Exchange rate)	**-0.076***	-0.043	-0.056	-0.069	-0.0006	0.001	-0.007	-0.0007
	(0.093)	(0.272)	(0.159)	(0.124)	(0.979)	(0.950)	(0.669)	(0.987)
Ln (Political globalisation)	0.432	0.767	0.935	0.475	**0.884** **	**0.919** **	**1.000** **	**0.886** **
	(0.435)	(0.201)	(0.171)	(0.394)	**(0.030)**	**(0.039)**	**(0.041)**	**(0.030)**
Civil Conflicts	0.038	0.065	0.030	0.035	-0.001	0.022	-0.005	0.0007
	(0.304)	(0.106)	(0.498)	(0.374)	(0.930)	(0.409)	(0.822)	(0.975)
Net Effects	0.0018	0.0047	0.0005	0.0008	nsa	nsa	nsa	nsa
AR(1)	(0.031)	(0.032)	(0.038)	(0.031)	(0.008)	(0.007)	(0.007)	(0.008)
AR(2)	**(0.757)**	**(0.744)**	**(0.846)**	**(0.773)**	(0.090)	(0.098)	(0.087)	(0.089)
Sargan OIR	(0.044)	(0.035)	(0.064)	(0.043)	(0.092)	(0.011)	(0.065)	(0.066)
Hansen OIR	**(0.170)**	**(0.274)**	**(0.406)**	**(0.178)**	**(0.432)**	**(0.161)**	**(0.286)**	**(0.398)**
DHT for instruments								
(a)Instruments in levels								
H excluding group	**(0.444)**	**(0.511)**	**(0.736)**	**(0.464)**	**(0.786)**	**(0.818)**	**(0.648)**	**(0.757)**
Dif(null, H=exogenous)	**(0.128)**	**(0.205)**	**(0.234)**	**(0.130)**	**(0.233)**	**(0.050)**	**(0.167)**	**(0.218)**
(b) IV (years, eq(diff))								
H excluding group	**(0.459)**	**(0.442)**	**(0.587)**	**(0.421)**	**(0.270)**	**(0.204)**	**(0.143)**	**(0.265)**
Dif(null, H=exogenous)	(0.043)	**(0.138)**	**(0.163)**	(0.061)	**(0.804)**	**(0.229)**	**(0.852)**	**(0.732)**
Fisher	**70.15*** **	**76.81*** **	**61.58*** **	**66.19*** **	**234.55*** **	**83.80*** **	**231.30*** **	**185.51*** **
Instruments	45	45	45	45	45	45	45	45
Countries	73	73	73	73	73	73	73	73
Observations	376	376	376	376	381	381	381	381

*,**,***: significance levels of 10%, 5% and 1% respectively. Totaid: Total aid. DHT: Difference in Hansen Test for Exogeneity of Instruments' Subsets. Dif: Difference. OIR: Over-identifying Restrictions Test. The significance of bold values is twofold. 1) The significance of estimated coefficients, Hausman test and the Fisher statistics. 2) The failure to reject the null hypotheses of: a) no autocorrelation in the AR (1) and AR(2) tests and; b) the validity of the instruments in the Sargan and Hansen OIR tests. The mean value of bilateral aid is 5.181. nsa: not specifically applicable because the model is invalid.

Table 5: Resources, Multilateral aid and Terrorism

	Fuel Export (ln)				Iron Ore Export (ln)			
	Domter	Tranater	Unclter	Totter	Domter	Tranater	Unclter	Totter
Constant	-4.382	-4.097	**-6.280****	-4.711	**-3.488***	**4.730****	**-3.200***	**-3.162***
	(0.188)	(0.169)	**(0.037)**	(0.107)	**(0.070)**	**(0.041)**	**(0.091)**	**(0.069)**
Fuel (ln) (-1)	**0.840*****	**0.810*****	**0.828*****	**0.836*****	---	---	---	---
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**				
Ore & Iron (ln)(-1)	---	---	---	---	**0.955*****	**0.894*****	**0.975*****	**0.957*****
					(0.000)	**(0.000)**	**(0.000)**	**(0.000)**
Domestic T. (Domter)	**0.002****	---	---	---	-0.0003	---	---	---
	(0.022)				(0.694)			
Transnational T. (Tranater)	---	**0.011***	---	---	---	**-0.016*****	---	---
		(0.055)				**(0.000)**		
Unclear T. (Unclter)	---	---	0.009	---	---	---	-0.011	---
			(0.243)				(0.144)	
Total T. (Totter)	---	---	---	**0.001****	---	---	---	-0.0004
				(0.012)				(0.560)
Multilateral Aid (LnMulaid)	0.032	0.046	0.019	0.039	-0.016	-0.067	-0.021	-0.024
	(0.587)	(0.515)	(0.748)	(0.506)	(0.737)	(0.247)	(0.651)	(0.631)
Domter × LnMulaid	**-0.001*****	---	---	---	-0.00003	---	---	---
	(0.000)				(0.842)			
Tranater × LnMulaid	---	**-0.004*****	---	---	---	**0.002***	---	---
		(0.006)				**(0.097)**		
Unclter × LnMulaid	---	---	**-0.003*****	---	---	---	0.0004	---
			(0.000)				(0.683)	
Totter × LnMulaid	---	---	---	**-0.0009*****	---	---	---	-0.00002
				(0.000)				(0.844)
LnTrade	0.019	-0.019	0.127	0.032	0.054	-0.123	-0.040	0.042
	(0.398)	(0.936)	(0.611)	(0.895)	(0.753)	(0.493)	(0.802)	(0.805)
LnInflation	-0.076	-0.080	-0.059	-0.068	-0.022	-0.050	-0.016	-0.021
	(0.162)	(0.116)	(0.186)	(0.197)	(0.501)	(0.137)	(0.551)	(0.532)
LnInfrastructure	0.049	0.089	0.041	0.047	-0.075	-0.041	-0.016	-0.074
	(0.569)	(0.355)	(0.642)	(0.582)	(0.200)	(0.594)	(0.767)	(0.220)
LnXrate (Exchange rate)	**-0.074***	-0.059	-0.031	-0.064	-0.019	-0.028	-0.015	-0.017
	(0.065)	(0.113)	(0.455)	(0.101)	(0.510)	(0.328)	(0.463)	(0.546)
Ln (Political globalisation)	**1.137***	**1.107***	**1.440*****	**1.156****	**0.938****	**1.478*****	**0.943****	**0.884****
	(0.060)	**(0.061)**	**(0.006)**	**(0.048)**	**(0.016)**	**(0.002)**	**(0.035)**	**(0.020)**
Civil Conflicts	**0.065***	0.037	0.057	**0.068***	-0.027	0.029	0.006	-0.019
	(0.070)	(0.247)	(0.130)	**(0.053)**	(0.358)	(0.376)	(0.799)	(0.526)
Net Effects	-0.0021	-0.0056	na	-0.0027	nsa	nsa	nsa	nsa
AR(1)	(0.033)	(0.030)	(0.036)	(0.034)	(0.007)	(0.006)	(0.005)	(0.007)
AR(2)	**(0.619)**	**(0.621)**	**(0.636)**	**(0.625)**	(0.080)	(0.084)	(0.074)	(0.080)
Sargan OIR	**(0.101)**	(0.074)	**(0.143)**	**(0.100)**	**(0.199)**	**(0.129)**	**(0.188)**	**(0.182)**
Hansen OIR	**(0.209)**	**(0.367)**	**(0.412)**	**(0.238)**	**(0.420)**	**(0.609)**	**(0.520)**	**(0.427)**
DHT for instruments								
(a)Instruments in levels								
H excluding group	**(0.359)**	**(0.383)**	**(0.670)**	**(0.357)**	**(0.580)**	**(0.592)**	**(0.625)**	**(0.453)**
Dif(null, H=exogenous)	**(0.202)**	**(0.376)**	**(0.268)**	**(0.237)**	**(0.320)**	**(0.529)**	**(0.403)**	**(0.402)**
(b) IV (years, eq(diff))								
H excluding group	**(0.260)**	**(0.328)**	**(0.242)**	**(0.235)**	**(0.233)**	**(0.423)**	**(0.466)**	**(0.231)**
Dif(null, H=exogenous)	**(0.242)**	**(0.477)**	**(0.836)**	**(0.365)**	**(0.877)**	**(0.844)**	**(0.534)**	**(0.899)**
Fisher	**62.00*****	**63.44*****	**81.33*****	**61.60*****	**317.18*****	**73.13*****	**153.74*****	**300.65*****
Instruments	45	45	45	45	45	45	45	45
Countries	73	73	73	73	73	73	73	73
Observations	374	374	374	374	379	379	379	379

*,**,***: significance levels of 10%, 5% and 1% respectively. Totaid: Total aid. DHT: Difference in Hansen Test for Exogeneity of Instruments' Subsets. Dif: Difference. OIR: Over-identifying Restrictions Test. The significance of bold values is twofold. 1) The significance of estimated coefficients, Hausman test and the Fisher statistics. 2) The failure to reject the null hypotheses of: a) no autocorrelation in the AR (1) and AR(2) tests and; b) the validity of the instruments in the Sargan and Hansen OIR tests. The mean value of multilateral aid is 4.163. nsa: not specifically applicable because the model is invalid. na: not applicable because at least one estimated coefficient needed for the computation of net effects is not significant.

Table 6: Resources, Total aid and Terrorism

	Fuel Export (ln)				Iron Ore Export (ln)			
	Domter	Tranater	Unclter	Totter	Domter	Tranater	Unclter	Totter
Constant	-5.506	-6.177	**-7.991***	-5.539	-3.552	**-4.148***	**-4.586***	**-3.765***
	(0.221)	(0.110)	**(0.073)**	(0.212)	(0.137)	**(0.059)**	**(0.053)**	**(0.089)**
Fuel (ln) (-1)	**0.793*****	**0.780*****	**0.761*****	**0.788*****	---	---	---	---
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**				
Ore & Iron (ln)(-1)	---	---	---	---	**0.909*****	**0.836*****	**0.931*****	**0.916*****
					(0.000)	**(0.000)**	**(0.000)**	**(0.000)**
Domestic T. (Domter)	**0.008*****	---	---	---	-0.001	---	---	---
	(0.009)				(0.398)			
Transnational T. (Tranater)	---	0.029	---	---	---	**-0.050****	---	---
		(0.205)				**(0.030)**		
Unclear T. (Unclter)	---	---	**0.048****	---	---	---	-0.010	---
			(0.019)				(0.703)	
Total T. (Totter)	---	---	---	**0.007*****	---	---	---	-0.001
				(0.002)				(0.597)
Total Aid (LnTotaid)	0.019	0.009	0.023	0.028	-0.039	-0.069	0.011	-0.029
	(0.842)	(0.922)	(0.777)	(0.772)	(0.460)	(0.247)	(0.817)	(0.558)
Domter × LnTotaid	**-0.001*****	---	---	---	0.0001	---	---	---
	(0.002)				(0.645)			
Tranater × LnTotaid	---	-0.005	---	---	---	**0.007***	---	---
		(0.189)				**(0.053)**		
Unclter × LnTotaid	---	---	**-0.008*****	---	---	---	0.000	---
			(0.002)				(0.929)	
Totter × LnTotaid	---	---	---	**-0.001*****	---	---	---	0.00004
				(0.001)				(0.887)
LnTrade	0.234	0.125	0.378	0.265	-0.065	-0.230	0.061	-0.040
	(0.568)	(0.734)	(0.358)	(0.502)	(0.697)	(0.176)	(0.722)	(0.803)
LnInflation	**-0.130***	-0.102	-0.082	**-0.133***	-0.004	-0.022	-0.004	-0.006
	(0.063)	(0.112)	(0.202)	**(0.055)**	(0.889)	(0.480)	(0.883)	(0.849)
LnInfrastructure	0.038	0.088	0.057	0.035	**-0.071***	-0.064	-0.040	-0.065
	(0.761)	(0.506)	(0.628)	(0.779)	**(0.099)**	(0.302)	(0.413)	(0.131)
LnXrate (Exchange rate)	**-0.102****	**-0.076***	**-0.081***	**-0.101****	0.004	0.017	-0.001	0.004
	(0.034)	**(0.094)**	**(0.076)**	**(0.035)**	(0.858)	(0.543)	(0.935)	(0.869)
Ln (Political globalisation)	**1.253***	**1.550****	**1.683****	**1.222***	**1.093****	**1.372*****	**1.119****	**1.131****
	(0.081)	**(0.017)**	**(0.022)**	**(0.089)**	**(0.016)**	**(0.004)**	**(0.028)**	**(0.016)**
Civil Conflicts	0.046	**0.086****	0.040	0.040	0.002	0.028	-0.007	0.005
	(0.290)	**(0.043)**	(0.313)	(0.389)	(0.926)	(0.274)	(0.732)	(0.835)
Net Effects	0.0024	na	0.0036	0.0014	nsa	nsa	nsa	nsa
AR(1)	(0.032)	(0.033)	(0.040)	(0.032)	(0.006)	(0.004)	(0.005)	(0.005)
AR(2)	**(0.741)**	**(0.724)**	**(0.818)**	**(0.763)**	(0.081)	(0.084)	(0.072)	(0.079)
Sargan OIR	(0.053)	(0.040)	(0.082)	(0.055)	(0.103)	(0.016)	(0.084)	(0.073)
Hansen OIR	**(0.228)**	**(0.335)**	**(0.528)**	**(0.236)**	**(0.433)**	**(0.245)**	**(0.295)**	**(0.396)**
DHT for instruments								
(a)Instruments in levels								
H excluding group	**(0.543)**	**(0.460)**	**(0.734)**	(0.055)	**(0.699)**	**(0.734)**	**(0.696)**	**(0.591)**
Dif(null, H=exogenous)	**(0.153)**	**(0.292)**	**(0.350)**	**(0.236)**	**(0.275)**	**(0.112)**	**(0.158)**	**(0.290)**
(b) IV (years, eq(diff))								
H excluding group	**(0.561)**	**(0.400)**	**(0.586)**	**(0.548)**	**(0.256)**	**(0.304)**	**(0.192)**	**(0.269)**
Dif(null, H=exogenous)	(0.045)	**(0.272)**	**(0.334)**	**(0.156)**	**(0.819)**	**(0.246)**	**(0.679)**	**(0.713)**
Fisher	**65.22*****	**68.66*****	**70.04*****	**62.58*****	**153.79*****	**97.06*****	**271.05*****	**126.57*****
Instruments	45	45	45	45	45	45	45	45
Countries	73	73	73	73	73	73	73	73
Observations	380	380	380	380	385	385	385	385

*,**,***: significance levels of 10%, 5% and 1% respectively. Totaid: Total aid. DHT: Difference in Hansen Test for Exogeneity of Instruments' Subsets. Dif: Difference. OIR: Over-identifying Restrictions Test. The significance of bold values is twofold. 1) The significance of estimated coefficients, Hausman test and the Fisher statistics. 2) The failure to reject the null hypotheses of: a) no autocorrelation in the AR (1) and AR(2) tests and; b) the validity of the instruments in the Sargan and Hansen OIR tests. The mean value of total aid is 5.550. nsa: not specifically applicable because the model is invalid. na: not applicable because at least one estimated coefficient needed for the computation of net effects is not significant.

3.2 Further discussion on conditional and unconditional effects

The first bone of contention in relation to the underpinning literature is the unexpected findings that terrorism increases resource exports. Accordingly, this positive unconditional relationship runs counter to the engaged studies, namely: the underpinnings of De Sousa *et al.* (2009a, 2019b), Richardson (2004) on security measures following the 9/11 terrorists' blow on the United States and Nitsch and Schumacher (2004) on a negative terrorism-trade nexus. In our view, these unanticipated signs could be traceable to at least four factors.

(1) The fact that the sampled periodicity reflects an era during which terrorist activities have been relatively less pronounced compared to more contemporary evidence. Accordingly, whereas the choice of the periodicity (1984-2008) used in this study has been amply justified in the introduction, it is worthwhile noting that according to the Global Terrorism Index (GTI, 2014, p. 13) terrorists activities and their corresponding negative externalities on developing countries have been relatively more substantial in the post -2011 Arab Spring era.

(2) Another very likely explanation eliciting the positive nexus between terrorism and fuel exports could be the weight of more advanced developing countries in the underlying relationship. Accordingly, relatively more advanced-developing oil-rich countries may be endowed with better logistical and financial capacities for absorbing the negative externalities of terrorist activities on fuel exports. This interpretation is in line with justifications of Asongu and Kodila-Tedika (2017a) on the narrative from Gaibulloev and Sandler (2009) which has been verified in an evolving body of literature, namely: Öcal and Yildirim (2010) and Meierrieks and Gries (2013).

(3) Developing countries confronted with terrorism activities may be motivated to enhance export volumes in a bid to increase the incremental government budget needed to combat underlying terrorists' activities. This explanation is based on the fact that countries in the Organisation of the Petroleum Exporting Countries (OPEC) produce far lower than their full capacities (Gault *et al.* 1999).

(4) Terrorists incidents in some countries may increase an investment appetite in the exploration, exploitation and ultimately, the exportation of fuel. The premise for this intuition is that the intention of some investors to engage with the fuel industry of countries associated with terrorism may be more than proportionate to terrorist activities if expected returns outweigh underlying risks. Contemporary examples include: (i) increasing investment from China in Nigeria's Delta region despite growing threats from the Movement for the Emancipation of the Niger Delta (MEND) (Obi, 2008) and (ii) China is still present in South

Sudan in spite of all security risks because South Sudan represents about 5% of crude oil imports by China (Aguirre, 2014). This justification is consistent with the attendant literature on China's oil diplomacy and a long term economic strategy of engaging countries with outlooks of political instability and/or strife (Elu and Price 2010, Asongu and Aminkeng 2013). As a policy implication, blanket policies aimed at employing development assistance to hedge to the potentially unfavourable impact of terrorism on fuel exports should be cautiously taken unless a prior negative terrorism-'fuel export' nexus is established.

Another unexpected finding we have established is the negative incidence pertaining to the interaction between foreign aid and fuel exports. One likely explanation for this unexpected negative marginal effect could be drawn from the political economy of development assistance. Accordingly, foreign aid devoted to fighting a hypothetical negative effect from a scourge may eventually yield the opposite effect. In essence, if the underlying incidence of terrorism on fuel exports is not first grasped by foreign policy, unexpected results should be expected, especially given the recent literature supporting the negative role of foreign aid on political instability and violence (Eubank 2012, Asongu 2015b). The corresponding implication for policy is that, it is recommendable for policy to first of all empirically establish how and by what degree terrorism negatively influences fuel exports prior to adopting development assistance to hedge against the corresponding negative impact that in effect, may not be apparent in the first place.

Consistent with the justifications provided to substantiate the geographical and temporal scopes discussed in the introduction, it is worthwhile to also engage how the findings established in this study complement existing literature that has also been based on the same periodicity and sample. It is worthwhile to articulate that while Bandyopadhyay *et al.* (2014) have focused on the incidence of development assistance in reducing the unfavourable effect of terrorism on FDI, Efobi *et al.* (2018) and Asongu *et al.* (2015) have extended the baseline paper by respectively conditioning the nexus on corruption-control levels and existing FDI levels. Furthermore, the last-two research papers which have respectively used a more robust version of the GMM technique and quantile regressions departs from Bandyopadhyay *et al.* (2014) in the light of the exclusive negative (positive) terrorism-FDI (incidence on FDI resulting from the moderating role of foreign aid on terrorism). This research has extended the stream of literature by: (i) using resource (fuel and iron ore) exports as the outcome indicators; (ii) failing to confirm the results from Bandyopadhyay *et al.* (2014) within perspectives of incidences of terrorism, foreign aid and

their corresponding interactive impacts on macroeconomic outcomes and (iii) only partially validating the findings of Efobi *et al.* (2018) and Asongu *et al.* (2015) in terms of the positive effect of terrorism and the negative effect of interactions. It should be noted that, while we have consistently established positive and negative effects from terrorism and 'interaction between terrorism and aid dynamics' respectively, the findings of Asongu *et al.* (2015) and Efobi *et al.* (2018) are consistent with our findings only with respect to certain specifications.

3.3 Extended analysis with net effects

Given the unexpected results, an extended analysis is performed in which net effects are computed. In accordance with recent literature on interactive regressions (Asongu and Odhiambo 2019a, 2019b, Agoba *et al.*, 2019), these net effects are constitutive of the unconditional effect from terrorism and the conditional impacts from the interaction between foreign aid and terrorism dynamics. Based on the extended analysis, bilateral aid and total aid modulate terrorism dynamics to induce net positive effects on fuel exports while multilateral aid moderates terrorism dynamics to engender negative net effects on fuel exports.

For example, in the second column of Table 1, the net effects from the role of bilateral aid in modulating the incidence of domestic terrorism on fuel exports is 0.0018 ([-0.001× 5.181] + [0.007]). In the calculation, 5.181 is the average value of bilateral aid, -0.001 is the unconditional effect of domestic terrorism while 0.007 is the conditional effect pertaining to the interaction between bilateral aid and domestic terrorism.

4. Concluding implications and further research directions

The motivation for this paper has been to assess the role of foreign aid in mitigating the documented negative evidence of terrorism on resource exports. We have built on evidence from the literature sustaining that terrorism is detrimental for trade exports to complement recent research on the relationship between terrorism proxies and macroeconomic indicators. In summary, the following findings have been established. First, in the light of the information criteria used to assess the validity of specifications, estimations pertaining to iron ore exports are not valid. Second, there is evidence of convergence in fuel exports. Third, while the unconditional effects of aid dynamics are not significant, the unconditional impacts of terrorism dynamics are consistently positive on fuel exports. Fourth, the interaction between terrorism and aid dynamics consistently display negative signs, with corresponding modifying aid thresholds within respective ranges.

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Convergence in fuel exports implies that countries with low-levels in fuel exports are catching-up their counterparts with higher levels. This implies the feasibility of common policies (by fuel-exporting countries) within a framework that would be determined by the timeline to full catch-up. Accordingly, with full catch-up, common or adopted policies can be implemented (by fuel-exporting countries) without distinction of nationality.

In the light of established findings and corresponding policy implications, there is evidently room for future research in: (i) understanding mechanisms by which terrorism positively affects fuel exports, (ii) using a periodicity that articulates a post-2011 Arab Spring tendency and (iii) considering initial fuel export levels in the modelling exercise.

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