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Abstract

We assess the effects of terrorism on capital flight in a panel of 29 African countries for which data is available for the period 1987-2008. The terrorism dynamics entail domestic, transnational, unclear and total terrorisms. The empirical evidence is based on Generalised Method of Moments (GMM) with forward orthogonal deviations and Quantile regressions (QR). The following findings are established. First, for GMM, domestic, unclear and total terrorisms consistently increase capital flight, with the magnitude relative higher from unclear terrorism. Second, for QR: (i) the effect of transnational terrorism is now positively significant in the top quantiles (0.75^{th} and 0.90^{th}) of the capital flight distribution, (ii) domestic and total terrorisms are also significant in the top quantiles and (iii) unclear terrorism is significant in the 0.10^{th} and 0.75^{th} quantiles. Policy implications are discussed.

JEL Classification: C50; D74 ; F23; N40 ; O55
Keywords: Capital flight, terrorism, Africa

1. Introduction

Terrorism is the new face of violence with economic consequences. In the context of a *paradoxical* African setting, where countries in this region are in need of scarce economic resources to foster their development process, and also records almost the highest volume of global capital flight among developing countries, we take interest in understanding its linkage to terrorism. As a foundational definition; capital flight is the outflow of economic resources from respective countries (Ndikumana, Boyce and Ndiaye, 2014; Asongu, 2014). It includes

the outflows of short-term capital as a response to some factors that are peculiar with the respective country, and which may affect the economic value of such capital. Concisely, we ask two important questions: first, what magnitude of the capital flight from Africa can be explained by terrorists' activities? Second, how different is this magnitude when comparing terrorism initiated by the nationals of the respective countries (domestic terrorism) and those initiated across borders or by nationals of other countries (transnational terrorism)?

The answer to the first question has important implications to provide relevant empirical evidence on the cost of the rising terrorism in *resource starved* Africa. Most importantly, by providing relevant statistics on the magnitude of influence of terrorism on capital flight, the reality of the cost of terrorism can be better seen and may spur policy actions. Most countries in Africa are taking steps towards attracting and retaining capital, although part of the effort is to improve security and reduce the risk of investment within the country, however, a new generation of policy may be motivated if the economic value (in terms of capital flight) of a terrorist action is clearly known. The answer to the second question may suggest the relative impact of the two forms of terrorism, and afterwards the direction of policy efforts can be exploited towards tackling the one with higher economic impact. This is important considering that there is a rising campaign for development partners to increase aid flow to African countries (as well as other development countries) in order to augment the resources needed for counter-terrorism efforts (see Bandyopadhyay et al, 2014; Efobi et al, 2015; Asongu et al, 2015).

Empirical studies on the drivers of capital flight can be broadly categorised into two groups: the domestic and external determinants. The domestic drivers include those conditions that are prevalent within the country, which explains the reasons for capital flight. They include the structural features of the economy (in terms of the country being natural resource dependence or otherwise), macroeconomic environment (e.g. economic growth and inflation), risk and returns on investment (e.g. currency depreciation, financial instability, domestic tax rate), the governance structure of the country (such as corruption), and other forms of political factors. Focusing on the political factors, authors have identified the political environment of countries as having a significant influence on capital flight (Collier et al., 2004; Davies, 2008; Ndikumana, Boyce and Ndiaye, 2014). Political instability such as war or civil unrest raises the insurance premium on investment, as well as the risk of loss or

damages to assets. This causes investment capitals to be taken out of the country to countries where the risks of losing such investment are lower.

Terrorism involves the use of violence by individuals or groups against non-combatants in order to foster political or social objectives, and with the intimidation of a larger audience beyond the immediate victims (Bandyopadhyay et al, 2014). Unlike political instability, terrorists are involved in pressuring besieged government to concede to their demands by targeting civilians. Since the occurrences of terrorist actions are non-deterministic and may not be accurately predicted; hence, it raises the risk and cost of retaining capital in the venue country. In most cases, terrorist target central economic locations; with poor anti-terrorism efforts by the government, target countries will witness an increasing outflow of capital due to heightened uncertainties/capital security. On this note, it is important to also consider the distinct impact of the two main forms of terrorism (i.e. domestic and transnational). This is because there are rising incidences of African countries experiencing spill-over from terrorist activities in neighbouring countries. The Somali's Al-Shabaab activities in Kenya and some other East African countries; and the Nigeria's Boko Haram group perpetrating violence in neighbouring country Cameroon, Niger and Chad, are cases in point.

The contrasting effect of domestic and transnational terrorism have spurred research interest that is targeted at understanding its impact on capital movement. The earliest work to carry on this enquiry, especially for developing countries, are Bandyopadhyay and Younas (2014), and Bandyopadhyay et al, (2014, 2015). The authors studied the effect of both domestic and transnational terrorism on movement of foreign investments; they found similar negative impact but at different magnitudes. In the spirit of the debate, we provide the first empirical work on the linkage between terrorism (and its components) and capital flight using an isolated sample of 29 African countries. This sample is unique because of the controversial regimes of capital outflow it records. Interested readers can see Ndikumana, Boyce and Ndiaye (2014) for a more detailed statistics of the trend of capital flight from Africa. However, we make attempt to highlight some: as at the period 1970-90, capital flight from Africa was about 40 percent of the entire private wealth, which was about four times that of Latin America despite the higher private capital per worker of the later. Also, in 2010, unrecorded capital flight from Africa represents 39.5 percent of GDP, compared to 12 percent in the East and South Asia. The implication of this statistics are: first, the region faces a lot of capital constraint compared to other regions and a capital flight of this magnitude will imply

that the available resources required for development will be further depleted. No wonder the huge resource gap recorded in the region (see Asiedu, 2006). Second, as a result of this impoverishment, the damaging effect on human development structures will be further visible as funds needed for social services such as education and health care, among others, will be lacking (see Ndikumana and Boyce, 2011). As a result of these, urgent attention is needed to understand other possible and emerging causes of capital flight as a further step towards resolving it.

This paper is connected to the literature on the determinants of capital flight on one hand, and the economic consequences of the rising rate of global terrorism, on the other hand. The first strand of literature have not considered the dynamic influence of terrorism on capital flight. The second strand of literature is becoming popular following the rising trend of terrorist attacks around the world. More importantly, attention is being drawn to understand the consequences as this will help to shape global policy on acts of terrorism. The contributors to this literature, and their focus has being: terrorism and its consequences on foreign investment (Bandyopadhyay and Younas, 2014; Bandyopadhyay et al, 2014, 2015; Asongu et al, 2015; Efobi et al, 2015); terrorism and the labour force (Berrebi and Ostwald, 2014a); terrorism and economic development (Piazza, 2006); terrorism and the productivity of certain sectors in the country (Berrebi and Klor, 2010; Berrebi and Ostwald, 2013); terrorism and fertility rate (Berrebi and Ostwald, 2014b). This study is the first to relate these two strands of literature by using a sample from the African region for the period 1987 to 2008 as well as a variety of macroeconomic controls. We implement a robust panel analysis to understand the effects of terrorism on capital flight as well as observe the dynamic implications across the different origins of terrorism (i.e. transnational, domestic). We find that terrorism as a whole causes an increase in capital flight in Africa. However, when considering the disaggregated terrorism data, domestic terrorism significantly causes capital flight unlike transnational terrorism. Even unclear terrorism was also found to have a significant impact on capital flight. The effect of the different forms of terrorism on capital flight (considering varying quantiles) was further computed. This is such that the effect is considered at different intensities of terrorism. The result suggest that at 75 percent quantile, both domestic and transnational significantly explains the extent of capital flight from African countries. As for the unclear terrorism and total terrorism, the impact on capital flight was significant across the levels of percentiles apart from 25 and 90 percent quantiles (unclear terrorism), and 10 percent quantile for total terrorism.

The remainder of the paper is outlined as follows: the second section lays out the empirical model, describes the variables and discuss the data. The econometric methodology was introduced and elaborated on in the third section, while the estimation results are presented and discussed in the fourth section. The fifth section concludes the paper.

2. Literature Review

In this section, we present theoretical reasoning showing how the rising wave of terrorism will further impact on the incidences of capital flights. The theoretical explanations in this section does not suggest that anti-terrorism measures are sufficient or relevant for the reduction of the rising capital flight in Africa, as this provides insight to further studies that can be taken up in the future.

The linkage between terrorism and capital flight is understood from the theoretical framework that explains how violence affects the movement of capital from a country. Collier (1999) presents a clear theoretical framework using civil war as a measure of violence, and its economic impact on respective countries. One of the main feature of Collier's theory is that the capital stock of countries tend to reduce as a result of incidences of civil war. Conflict increases the rate of uncertainty with respect to the future returns on assets held within the country. As a result of this, domestic investors relocate their capital abroad. This is termed portfolio substitutions. Some studies that support this proposition include Le and Zak (2001), Ndikumana and Boyce (2002), and Davies (2010).

To properly situate this theoretical framework, it is important to discuss how terrorism differ from other forms of violence like war, domestic conflicts and instabilities. Terrorism and other forms of violence are similar in terms of their resultant effects. Which are mostly loss of life and property. However, a clear distinction between them can be seen in their targets. For terrorism, the targets are often non-combatant individuals (see Bandyopadhyay, Sandler and Younas, 2014), who may be unaware of the ideologies or the objectives of the terrorists. Terrorists aim at non-combatants in order to raise their anxiety levels so that they pressure their government to grant the terrorist's demands (Gaibulloev and Sandler, 2010). This explains the reasons for a unified global effort targeted against terrorist activities: its effect adversely impacts innocent non-combatants. On the other-hand, the targets of other forms of violence are mostly combatants or government forces, and to a large extent, the violence is spurred by one party being disgruntled or having a deep feeling of being cheated (see Collier

and Hoeffler, 2002; Sharma, 2006; Sandlers and Emders, 2008; Bellows and Miguel, 2009; Fearon and Laitin, 2011).

Terrorism can be categorised into two main groups: domestic and transnational terrorism. Domestic terrorism is home grown and home directed and the perpetrators, victims, and audience are from the venue country. This is unlike transnational terrorism with perpetrators, supporters, victims, and audience involving two or more countries (Bandyopahyay, Sandler and Younas, 2011). There are varying impact of these two forms of terrorism on the domestic capital stocks of countries. Gaibulloev and Sandler (2011) examines this effect on the income per capita of African countries for the period 1970-2007. For the entire sample, they found a transnational terrorism as having a significant impact on income per capita: the absence of a domestic terrorism impact was also observed. One identified reason for the differences in the impact of the two forms of terrorism is that transnational terrorism targets foreign citizens, foreign businesses (including personnel and assets), as well as international institutions. This will have a significant effect on capital retention in the country (Sandler and Enders, 2008).

Banyopadhyay, Sandler and Younas (2014) is another closely related study, but with emphasis on a broader sample of 72 developing countries, and focusing on counterterrorism effect of foreign aid. The authors found the both types of terrorism having a depressing effect on foreign investment. Their intuition is: terrorist activities tend to increase the premium on retaining investment in the venue country, and heightens the risk capital and output losses, and other overhead cost like security. As a result of this, investment capital tend to be repatriated from countries that are prone to terrorist activities. As a comment on the issue of violence and capital repatriation, Ndikumana, Boyce and Ndiaye (2014) supports this finding but with a focus on other violent activities apart from terrorism.

What interest us here is how we can apply the portfolio substitutions theory of collier (1999) to explain the relationship being modelled in this study. We expect a positive relationship between terrorism and capital flight, however when considering the components of terrorism (i.e. domestic and transnational terrorism), we will rely on some theoretical explanations. For instance, transnational terrorism targets foreign citizens, foreign businesses and international institutions that are operational within the country, therefore it is expected that its impact will stimulate more capital repatriation from the affected country compared to domestic terrorism. The studies (i.e. Sandler and Enders, 2008; Gaibulloev and Sandler, 2011) that reached this

conclusion was focusing on a different form of capital – foreign investment – unlike the interest of this study. The mechanism is that: since terrorism affect the economic value of capital, capital owners will tend to substitute the location of their capital from the respective country to another location abroad (see Collier, 1999). We are cautious to say that this theoretical explanation applies for only transnational terrorism, especially since we are considering capital flight and not foreign investment, like other studies have focused on. Better clarity will be reached from our empirical analysis.

3. Data and Methodology

3.1 Data

The terrorism data are from Efobi et al. (2015) and Bandyopadhyay et al. (2014). The capital flight data is from Boyce and Ndikumana (2012a). The matching process yields a panel of 29 African countries for the period 1987-2008[1], consisting of three year non-overlapping intervals. The dependent variable is capital flight, whereas the independent variables are dynamics of terrorisms, namely: domestic, transnational, unclear and total terrorisms, with the last measurement being the sum of the first-three. The interest of using a plethora of terrorism indicators is to avail more room for policy implications. Following the empirical literature on capital flight, we apply the direct definition of capital flight as defined by Boyce & Ndikumana (2012ab) as those unrecorded capital flows between a country and the rest of the world, whose measurement begins from the inflows of foreign exchange that are recorded in the country's Balance of Payments (BoP), in which 'missing money' – the difference between recorded inflows and recorded outflows – is reported as 'net errors and omissions. This measure has gained credence in most studies that have examined capital flight from different empirical

It is important to devote some space to discuss the different dimensions of capital flight as contained in the empirical literature. It includes the direct 'hot money' measure of capital flight and the indirect 'residual' measure. The direct measure involves the computation of

[1] The adopted countries include: Algeria, Angola, Botswana, Burkina Faso, Cameroon, Congo Democratic Republic, Congo Republic, Côte d'Ivoire, Egypt, Ethiopia, Gabon, Ghana, Guinea, Guinea Bissau, Kenya, Madagascar, Malawi, Morocco, Mozambique, Nigeria, Sierra Leon, South Africa, Sudan, Tanzania, Togo, Tunisia, Uganda, Zambia and Zimbabwe.

capital flight from the official balance of payment (BOP) data. It is the outflow of short-term capitalfrom respective countries to abroad in response to the prevailing determinants as identified in the literature. As such, it is measured as the summation of the net errors and omissions in the BOP and other short term capitals (see Ndikumana, Boyce and Ndiaye, 2014). The indirect approach computes capital flight as the difference between the recorded inflows and the recorded uses of the foreign exchange.

The control variables include: corruption-control, fuel exports, trade openness and exchange rate. These have been substantially documented in the African capital flight literature (Boyce & Ndikumana, 1998, 2001, 2003, 2008, 2011, 2012ab; Asongu, 2013a, 2014a, 2015; Weeks, 2012). First, capital flight has been documented to increase with poor institutional quality, notably: the absence of corruption-control (Weeks, 2012). The expected sign of this governance indicator depends on whether the distribution of corruption-control is positively or negatively skewed. This is consistent with Asongu and Nwachukwu (2015) who have based their study on bad governance because the governance indicators employed were negatively skewed for the most part. Second, according to Boyce and Ndikumana (2003, 2012b), fuel-exporting countries are generally associated with higher levels of capital flight. Third, in accordance with Asongu (2013a), trade globalization is a natural determinant of capital flight, especially with practices like transfer pricing (Boyce & Ndikumana, 2008, 2011; Asongu, 2015). Fourth, very high deterioration of exchange rate increases capital flight (Asongu, 2014; Boyce & Ndikumana, 2003) because it betrays a negative economic outlook. Accordingly, investors prefer investment strategies that are less economically ambiguous (Le Roux & Kelsey, 2015ab). The definitions of the variables are provided in Table 1 below.

Table 1: Definition and source of variables

Variables	Signs	Definitions	Sources
Capital Flight	capf	Logarithm of real capital flight (million, constant USD)	Boyce & Ndikumana (2012a)
Corruption-control	CC	"*Control of corruption (estimate): captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests*".	WDI (World Bank)
Fuel Export	F_Exp	Fuel Export (as a % of Merchandise Export)	
Exchange rate	logxrate	Logarithm Exchange rate (local currency per USD)	Bandyopadhyay et al. (2014)
Trade Openness	tradeg	Exports plus Imports of Commodities (% of GDP)	
Domestic terrorism	incd	Number of Domestic terrorism incidents	
Transnational terrorism	inct	Number of Transnational terrorism incidents	
Unclear terrorism	incu	Number of terrorism incidents whose category in unclear	
Total terrorism	incdtu	Total number of terrorism incidents (inct + incu + incdtu)	

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

The summary statistics of the variables is presented in Table 2. Some of the indicators are presented in logarithms to enable comparisons in terms of means. We also notice that there is a substantial degree variation in the variables, implying that we can be confident that significant estimated relationships would emerge.

Table 2: Summary statistics

	Mean	S.D	Minimum	Maximum	Obs
Capital Flight (log)	2.843	0.696	-0.221	4.473	171
Corruption-Control	-0.394	0.544	-2.061	1.128	232
Fuel Export	16.745	30.695	0.000	97.896	232
Exchange rate (log)	1.341	2.066	-9.607	9.349	232
Trade Openness	62.979	26.764	12.420	155.957	230
Domestic terrorism	5.344	19.135	0.000	153	232
Transnational terrorism	0.892	2.223	0.000	23.333	232
Unclear terrorism	1.022	5.571	0.000	67.666	232
Total terrorism	7.260	24.578	0.000	180.333	232

S.D: Standard Deviation. Obs: Observations.

Table 3 below presents the summary statistics of the variables. Its purpose is to mitigate potential issues of multicollinearity. We observe that such issues are apparent among terrorism variables which display relatively higher degrees of substitution. We address these issues by using distinct specifications for each terrorism variable.

Table 3: Correlation Matrix (Uniform sample size=170)

Control Variables				Independent Variables (Terrorism Dynamics)				Dep. Vble	
CC	F_Exp	logxrate	tradeg	incd	inct	incu	incdtu	capf	
1.000	-0.157	-0.316	-0.219	0.029	-0.057	0.039	0.026	0.064	CC
	1.000	-0.001	0.105	0.243	0.330	0.090	0.239	0.423	F_Exp
		1.000	0.062	-0.087	-0.085	-0.032	-0.082	-0.170	logxrate
			1.000	-0.085	-0.044	-0.108	-0.094	0.082	tradeg
				1.000	**0.540**	**0.717**	**0.986**	0.256	incd
					1.000	0.286	**0.574**	0.229	inct
						1.000	**0.809**	0.183	incu
							1.000	0.261	incdtu
								1.000	capf

Dep. Vble: Dependent Variable. CC: Corruption-Control. F_Exp: Fuel Exports. logxrate: exchange rate. tradeg: trade openness. incd: domestic terrorism. inct: transnational terrorism. incu: unclear terrorism. Incdtu: total terrorism. capf: capital flight.

3.2 Methodology

3.2.1Generalised Method of Moments (GMM)

In accordance with recent terrorism (Efobi et al., 2015) and capital flight (Asongu, 2014a) literature, we adopt a *two-step* GMM with forward orthogonal deviations instead of differencing as an empirical strategy. This technique is an extension of Arellano and Bover (1995) by Roodman (2009ab) and has the advantage of accounting for cross-sectional dependence and restricting the proliferation of instruments (Love & Zicchino, 2006; Baltagi, 2008).

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

$$CF_{i,t} = \sigma_0 + \sigma_1 CF_{i,t-\tau} + \sum_{j=1}^{4} \sigma_j T_{j,i,t-\tau} + \sum_{h=1}^{4} \delta_h W_{h,i,t-\tau} + \eta_i + \xi_t + \varepsilon_{i,t} \quad (1)$$

$$\begin{aligned} CF_{i,t} - CF_{i,t-\tau} = {} & \sigma_0 + \sigma_1 (CF_{i,t-\tau} - CF_{i,t-2\tau}) + \sum_{j=1}^{4} \sigma_j (T_{j,i,t-\tau} - T_{j,i,t-2\tau}) \\ & + \sum_{h=1}^{4} \delta_h (W_{h,i,t-\tau} - W_{h,i,t-2\tau}) + (\xi_t - \xi_{t-\tau}) + \varepsilon_{i,t-\tau} \end{aligned} \quad (2)$$

Where: $CF_{i,t}$ is capital flight in country i at period t; α is a constant; τ represents tau ; T, entails terrorism dynamics (domestic, transitional, unclear and total) ; W is the vector of control variables (*corruption-control*, *trade openness, exchange rate* and *fuel exports*), 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.

3.2.2 Quantile Regressions

Consistent with the literature on conditional effects (Asongu et al., 2015), in order to investigate if existing levels of capital flight affect the impact of terrorism on capital flight, we employ a quantile regression (QR) approach. It consists of assessing the impact of terrorism throughout the conditional distributions of capital flight (Keonker & Hallock, 2001).

Contrary to Ordinary Least Squares (OLS) that is based on the assumption of normally distributed error terms, the QR technique is not based on the hypothesis that capital flight and error terms are normally distributed. Accordingly, the QR approach enables us to investigate the effect of terrorism with particular emphasis on low- medium- and high-'capital flight' countries. The interest of the technique is based on the intuition that blanket policies from the terrorism-'capital flight' nexus may not be efficient, unless they are contingent on initial capital flight levels and tailored differently across low- medium- and high-'capital flight' countries. In essence, with QR, parameters are estimated at multiple points of the conditional distributions of capital flight (Keonker & Hallock, 2001). This technique is increasingly being employed in development literature, notably in: finance (Asongu, 2014b), corruption (Billger & Goel, 2009; Okada & Samreth, 2012; Asongu, 2013b; Efobi et al., 2014) and health (Asongu, 2014c) studies.

The θ^{th} quantile estimator of terrorism is obtained by solving for the following optimization problem, which is presented without subscripts in Eq. (3) for ease of presentation.

$$\min_{\beta \in R^k} \left[\sum_{i \in \{i: y_i \geq x_{i'}\beta\}} \theta \left| y_i - x_{i'}\beta \right| + \sum_{i \in \{i: y_i \geq x_{i'}\beta\}} (1-\theta) \left| y_i - x_{i'}\beta \right| \right] \quad (3)$$

Where $\theta \in (0,1)$. Contrary to OLS that is fundamentally based on minimizing the sum of squared residuals, with QR, we minimise the weighted sum of absolute deviations. For instance the 10^{th} or 90^{th} quantiles (with θ=0.10 or 0.90 respectively) by approximately weighing the residuals. The conditional quantile of capital flight or y_i given x_i is:

$$Q_y(\theta / x_i) = x_{i'}\beta_\theta \quad (4)$$

where unique slope parameters are modelled for each θ^{th} specific quantile. This formulation is analogous to $E(y / x) = x_{i'}\beta$ in the OLS slope where parameters are examined only at the mean of the conditional distribution of capital flight. For the model in Eq. (4) the dependent

variable y_i is the capital flight indicator while x_i contains a constant term, *corruption-control*, *trade openness, exchange rate* and *fuel exports*. The specifications in Eq. (3) are tailored to avoid the multicollinearity issues between terrorism variables identified in Table 3.

4. Empirical results

4.1 Presentation of results

Table 4 and Table 5 present results corresponding to GMM and QR estimations. We engage them chronologically. Table 4 is presented in four main sets of specifications, notably for: domestic, transnational, unclear and total terrorism. Each set of specification entails three main regressions with incremental control variables. From Efobi et al. (2015), five main information criteria or post-estimation diagnostics are employed to assess the validity of models. First, the null hypothesis of the second-order Arellano and Bond autocorrelation test (*AR2*) in difference should not be rejected because its null hypothesis is the position for the absence of autocorrelation in the residuals. Second, the null hypothesis of the Sargan and Hansen tests for over-identification should also not be rejected because their null hypotheses are the positions that the instruments are valid or not correlated with the error terms. It should be noted that while the Sargan over-identifying restrictions (*OIR*) test is not robust and not weakened by instruments, the Hansen *OIR* test is robust and weakened by instruments. Third**,** the Difference in Hansen Test (*DHT*) for the exogeneity of instruments is further employed to confirm the validity of the Hansen *OIR* results. Fourth, the Fisher test for joint validity of estimated coefficients is also provided. Its null hypothesis is the position that the joint estimated coefficients are not valid; hence should be rejected. Fifth, we ensure that the rule of thumb for restricting over-identification or mitigating the proliferation of instruments is respected with the number of cross-sections higher than the number of instruments. Based on highlighted the information criteria: (i) all models are valid at the 1% and 5% significance levels and (ii) five of the twelve models are valid if the 10% significance level is incorporated.

We consider the former (1% and 5% levels) in establishing the following findings. First, domestic, unclear and total terrorisms consistently increase capital flight, with the magnitude relatively higher from unclear terrorism. Second, most of the significant control variables have the expected signs, notably: (i) corruption-control that is negatively skewed increases capital flight; (ii) trade globalisation is positive related with capital flight and (iii) the sign of

exchange rate is indeterminate while that of 'fuel exports' is unexpected. Fortunately, the signs of fuel exports are consistently positive in the QR findings.

Table 4: Capital Flight and Terrorism (GMM)

	Dependent Variable: Capital Flight (Log)											
	Domestic Terrorism			Transnational Terrorism			Unclear Terrorism			Total Terrorism		
Capital Flight (log)(-1)	**0.275*** **	**0.276*** **	**0.290*** **	0.006	0.094	0.080	**1.506*** **	**1.556*** **	**0.475*** **	**0.288** **	**0.350*** **	**1.414*** **
	(0.005)	**(0.003)**	**(0.007)**	(0.952)	(0.271)	(0.348)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.014)**	**(0.001)**	**(0.001)**
Constant	**1.992*** **	**1.820*** **	**1.704*** **	**2.919*** **	**2.495*** **	**2.377*** **	**0.313*** **	**0.344*** **	**1.167*** **	**1.680*** **	**1.625*** **	**0.400*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.009)**	**(0.002)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.002)**
Domestic Terrorism	**0.004*** **	**0.003*** **	**0.004*** **	---	---	---	---	---	---	---	---	---
	(0.002)	**(0.000)**	**(0.000)**									
Transnational Terrorism	---	---	---	-0.006	-0.004	0.006	---	---	---	---	---	---
				(0.625)	(0.684)	(0.595)						
Unclear Terrorism	---	---	---	---	---	---	**0.016*** **	**0.017*** **	**0.015*** **	---	---	---
							(0.000)	**(0.000)**	**(0.000)**			
Total Terrorism	---	---	---	---	---	---	---	---	---	**0.004*** **	**0.004*** **	**0.004*** **
										(0.004)	**(0.000)**	**(0.000)**
Corruption-Control	**0.404*** **	**0.370*** **	**0.385*** **	**0.245** **	**0.309*** **	**0.238*** **	**0.509*** **	**0.532*** **	**0.518*** **	**0.441*** **	**0.432*** **	**0.447*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.045)**	**(0.000)**	**(0.002)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Trade Openness	0.004	0.001	**0.004** **	0.001	-0.00002	0.002	**0.005***	0.002	**0.006*** **	0.004	0.001	**0.004*** **
	(0.201)	(0.377)	**(0.016)**	(0.428)	(0.988)	(0.170)	**(0.078)**	(0.199)	**(0.000)**	(0.190)	(0.454)	**(0.008)**
Exchange rate(log)	---	-0.001	0.010	---	0.018	**0.022***	---	**-0.027***	-0.011	---	-0.007	0.002
		(0.884)	(0.412)		(0.253)	**(0.063)**		**(0.074)**	(0.377)		(0.568)	(0.844)
Fuel Exports	---	---	-0.0009	---	---	0.001	---	---	**-0.004*** **	---	---	**-0.002***
			(0.434)			(0.492)			**(0.001)**			**(0.053)**
AR(1)	(0.014)	(0.010)	(0.020)	(0.048)	(0.010)	(0.027)	(0.011)	(0.005)	(0.006)	(0.016)	(0.011)	(0.012)
AR(2)	(0.096)	(0.092)	**(0.110)**	**(0.236)**	**(0.162)**	**(0.185)**	(0.085)	(0.065)	(0.060)	**(0.100)**	(0.081)	(0.080)
Sargan OIR	(0.058)	**(0.113)**	(0.098)	**(0.391)**	**(0.351)**	**(0.336)**	**(0.638)**	**(0.404)**	**(0.407)**	(0.087)	**(0.109)**	**(0.120)**
Hansen OIR	**(0.406)**	**(0.447)**	**(0.272)**	**(0.819)**	**(0.666)**	**(0.480)**	**(0.722)**	**(0.564)**	**(0.288)**	**(0.484)**	**(0.413)**	**(0.282)**
DHT for instruments												
(a)Instruments in levels												
H excluding group	**(0.381)**	**(0.522)**	**(0.493)**	**(0.459)**	**(0.601)**	**(0.226)**	**(0.545)**	**(0.651)**	**(0.326)**	**(0.371)**	**(0.516)**	**(0.446)**
Dif(null, H=exogenous)	**(0.391)**	**(0.368)**	**(0.204)**	**(0.849)**	**(0.576)**	**(0.651)**	**(0.672)**	**(0.429)**	**(0.304)**	**(0.497)**	**(0.335)**	**(0.233)**
(b) IV (years, eq(diff))												
H excluding group	(0.076)	**(0.246)**	**(0.138)**	**(0.731)**	**(0.512)**	**(0.250)**	**(0.668)**	**(0.804)**	**(0.341)**	**(0.231)**	**(0.459)**	**(0.191)**
Dif(null, H=exogenous)	**(0.924)**	**(0.688)**	**(0.662)**	**(0.686)**	**(0.663)**	**(0.801)**	**(0.588)**	**(0.255)**	**(0.284)**	**(0.689)**	**(0.346)**	**(0.526)**
Fisher	**17.52*** **	**65.45*** **	**44.55*** **	**6.60*** **	**22.90*** **	**11.67*** **	**26.79*** **	**131.1*** **	**681.5*** **	**6.77*** **	**47.30*** **	**70.27*** **
Instruments	21	25	29	21	25	29	21	25	29	21	25	29
Countries	28	28	28	28	28	28	28	28	28	28	28	28
Observations	118	118	118	118	118	118	118	118	118	118	118	118

*,**,***: significance levels of 10%, 5% and 1% respectively. 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 OIR test.

Table 5 on QR is presented in two main panels, notably Panel A on domestic and transnational terrorisms and Panel B on unclear and total terrorisms. We notice that the OLS findings are consistently different from the QR estimations, which justifies the choice of the estimation technique. It is interesting to note that the findings of Table 4 are based on mean effects of the dependent variable while those of Table 5 are based on conditional quantiles of the dependent variables. The following can be established for Table 5 with 1% and 5% significance levels. First, contrary to Table 4, the effect of transnational terrorism is now significant in the top quantiles (0.75^{th} and 0.90^{th}) of the capital flight distribution. Second, domestic terrorism is also significant in the top quantiles. Third, unclear terrorism is significant in the 0.10^{th} and 0.75^{th} quantiles. Fourth, the effect of total terrorism is also

significant in top quantiles. Fifth, the significant control variable (or 'fuel exports') has the expected sign.

Table 5: Capital Flight and Terrorism (Quantile regression)

	Dependent Variable: Capital Flight (log)											
	Panel A: Domestic Terrorism and Transnational Terrorism											
	Domestic Terrorism						Transnational Terrorism					
	OLS	**Q.10**	**Q.25**	**Q.50**	**Q.75**	**Q.90**	**OLS**	**Q.10**	**Q.25**	**Q.50**	**Q.75**	**Q.90**
Constant	**2.620*** **	**1.989*** **	**2.394*** **	**2.688*** **	**3.009*** **	**3.151*** **	**2.638*** **	**1.942*** **	**2.428*** **	**2.730*** **	**3.019*** **	**3.285*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Domestic Terrorism	**0.005*** **	0.007	0.006	**0.003***	**0.006** **	**0.005*** **	---	---	---	---	---	---
	(0.007)	(0.20)	(0.128)	**(0.091)**	**(0.015)**	**(0.004)**						
Transnational Terrorism	---	---	---	---	---	---	0.026	-0.020	0.030	0.013	**0.041** **	**0.037** **
							(0.160)	(0.613)	(0.333)	(0.454)	**(0.031)**	**(0.049)**
Corruption-Control	0.126	0.093	0.176	0.145	0.085	0.139	0.138	0.075	0.094	0.171	0.113	0.136
	(0.150)	(0.715)	(0.322)	(0.229)	(0.485)	(0..379)	(0.117)	(0.751)	(0.581)	(0.125)	(0.364)	(0.280)
Trade Openness	0.002	0.0003	-0.000	0.001	0.002	0.004	0.001	0.001	-0.001	0.0008	0.002	0.002
	(0.238)	(0.953)	(0.999)	(0.451)	(0.285)	(0.158)	(0.286)	(0.829)	(0.692)	(0.679)	(0.336)	(0.383)
Exchange rate(log)	**-0.041** **	-0.045	-0.061	-0.036	-0.036	-0.003	**-0.042** **	-0.056	-0.043	-0.032	-0.025	-0.002
	(0.030)	(0.539)	(0.164)	(0.206)	(0.088)	(0.854)	**(0.025)**	(0.229)	(0.330)	(0.215)	(0.247)	(0.874)
Fuel Exports	**0.008*** **	0.007	**0.008*** **	**0.009*** **	**0.007*** **	**0.006** **	**0.008*** **	0.008	**0.010*** **	**0.010*** **	**0.008*** **	**0.006*** **
	(0.000)	(0.148)	**(0.002)**	**(0.000)**	**(0.000)**	**(0.017)**	**(0.000)**	(0.060)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.002)**
Pseudo R^2/R^2	0.241	0.071	0.128	0.156	0.172	0.204	0.227	0.078	0.119	0.148	0.169	0.204
Fisher	**9.38*** **						**8.90*** **					
Observations	170	170	170	170	170	170	170	170	170	170	170	170

	Panel B: Unclear Terrorism and Total Terrorism											
	Unclear Terrorism						Total Terrorism					
	OLS	**Q.10**	**Q.25**	**Q.50**	**Q.75**	**Q.90**	**OLS**	**Q.10**	**Q.25**	**Q.50**	**Q.75**	**Q.90**
Constant	**2.622*** **	**1.992*** **	**2.398*** **	**2.734*** **	**2.974*** **	**3.167*** **	**2.613*** **	**1.991*** **	**2.394*** **	**2.703*** **	**2.987*** **	**3.150*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Unclear Terrorism	**0.016*** **	**0.025*** **	0.019	**0.014*** **	**0.009***	0.006	---	---	---	---	---	---
	(0.000)	**(0.000)**	(0.102)	**(0.007)**	**(0.051)**	(0.378)						
Total Terrorism	---	---	---	---	---	---	**0.004*** **	0.005	**0.005***	**0.003***	**0.003** **	**0.005*** **
							(0.003)	(0.164)	**(0.055)**	**(0.099)**	**(0.048)**	**(0.001)**
Corruption-Control	0.126	0.098	0.168	0.152	0.105	0.111	0.127	0.100	0.176	0.153	0.103	0.114
	(0.150)	(0.724)	(0.342)	(0.165)	(0.308)	(0.486)	(0.147)	(0.698)	(0.271)	(0.229)	(0.411)	(0.479)
Trade Openness	0.002	0.0003	-0.00007	0.0007	0.002	0.003	0.002	0.0003	-0.000	0.001	0.002	0.003
	(0.229)	(0.964)	(0.983)	(0.726)	(0.156)	(0.202)	(0.225)	(0.963)	(0.999)	(0.558)	(0.257)	(0.216)
Exchange rate(log)	**-0.044** **	-0.042	-0.061	-0.035	-0.024	-0.004	**-0.041** **	-0.041	-0.061	-0.034	-0.032	-0.004
	(0.017)	(0.425)	(0.159)	(0.174)	(0.299)	(0.825)	**(0.029)**	(0.585)	(0.121)	(0.251)	(0.245)	(0.818)
Fuel Exports	**0.008*** **	0.006	**0.008*** **	**0.010*** **	**0.008*** **	**0.007** **	**0.008*** **	0.006	**0.008*** **	**0.009*** **	**0.008*** **	**0.007** **
	(0.000)	(0.130)	**(0.001)**	**(0.000)**	**(0.000)**	**(0.013)**	**(0.000)**	(0.198)	**(0.001)**	**(0.000)**	**(0.000)**	**(0.014)**
Pseudo R^2/R^2	0.240	0.082	0.127	0.156	0.180	0.198	0.244	0.071	0.127	0.157	0.177	0.205
Fisher	**13.01*** **						**9.61*** **					
Observations	170	170	170	170	170	170	170	170	170	170	170	170

*,**,***: significance levels of 10%, 5% and 1% respectively. OLS: Ordinary Least Squares. R^2 for OLS and Pseudo R^2 for quantile regression. Lower quantiles (e.g., Q 0.1) signify nations where Capital flight is least.

4.3 Further discussion and policy implications

We have broadly established that terrorism negatively affects capital flight. This finding is consistent with the theoretical underpinnings enunciated in the motivation of this line of inquiry. Whereas the effect from transnational terrorism is not significant in GMM specifications, we have found it to be significant in top quantiles of the QR specifications. The direct implication is that the effects based on mean distributions of capital flight are not apparent for transnational terrorism. The position of insignificance based on mean

distributions of capital flight is further confirmed by the insignificance of the transnational terrorism estimation in the corresponding OLS model.

A second fact worth noting from the comparative methodological assessment is that the established positive effects from domestic and total terrorism in GMM specifications are driven by top quantiles of the capital flight distribution. By implication, the positive effect of domestic, transnational and total terrorisms on capital flight are more apparent in countries with high levels of capital flight.

The positive effect of terrorism on capital flight has substantial implications for African business and sustainable development, notably: in the need for investment and importance of inclusive development in the post-2015 development agenda. Accordingly, there is a growing stream of African business literature supporting the need for investment (Rolfe & Woodward, 2004; Bartels et al., 2009; Asiedu & Lien, 2011; Anyanwu, 2012). According to Asiedu et al. (2012), a fundamental factor behind Africa's underdevelopment is the lack of long term investment capital that is essential for sustainable growth. Unfortunately, according to the same authors, the continent is characterised by substantial capital flight levels despite being capital starved. The April 2015 World Bank publication on Millennium Development Goals has recently shown that poverty has been decreasing in all regions of the world with the exception of Sub-Saharan Africa (World Bank, 2015). In line with recent capital flight literature (Boyce & Ndikumana, 2012b), concerns about immiserizing growth and capital flight are most acute in rich countries of the sub-region; a position that is consistent with recent quality of growth (QG) literature from the International Monetary Fund (IMF) (Mlachila et al., 2014, p.27). For example the Republic of Congo and Gabon are among Africa's wealthiest countries with the 15th and 5th ranks and corresponding per capita incomes of $1,253 and $4,176. The QG shows deterioration in the positions of these countries (partly due to capital flight) between 1990 and 2011. Accordingly, from a comparative assessment of 93 developing countries in the periods 1990-1994, 1995-1999, 2000-2004 and 2005-2011, the rankings of these countries has deteriorated: the Congo Republic (59th, 70th, 74th and 84th) and Gabon (58th, 61st, 67th and 69th).

It is also important to devote space the discussing the policy implications relating to capital flight convergence. We notice evidence of catch-up in regressions related to domestic, unclear and total terrorisms. Consistent with the capital flight catch-up literature (Asongu, 2014a), the criterion for evidence of conditional catch-up is when the absolute value of the

lagged capital flight variable is between zero and one. The convergence rates are: (i) 9.16% (0.275/3) per annum (p.a), 9.20% (0.276/3) p.a and 9.66% (0.290/3) p.a for domestic terrorism-related regressions; (ii) 15.83% (0.475/3) p.a for unclear terrorism-oriented specifications and (iii) 9.60% (0.288/3) p.a and 11.66% (0.350/3) p.a for total terrorism-linked estimations[2]. The corresponding timelines to full catch-up are: (i) 32.75 (300%/9.16%) years (yrs), 32.60 (300%/9.20%) yrs and 31.05 (300%/9.66%) yrs for domestic terrorism-related regressions; (ii) 18.95 (300%/15.83%) yrs for unclear terrorism-oriented specifications and (iii) 31.25 (300%/9.60%) yrs and 25.72 (300%/11.66%) yrs for total terrorism-linked estimations. Evidence of catch-up implies that common policies among sampled countries in the fight against capital flight is possible while the presence of full catch-up means that the underlying common policies can be implemented without distinction of nationality or locality within sampled countries. The full catch-up period of between 18.95 and 32.75 years is broadly consistent with the full catch-up variation of between 14.8 and 33.1 years from Asongu (2014a, p.111). It is interesting to note that the comparison is most feasible for the: (i) full sample and (ii) 3 year non-overlapping interval; modelling from the corresponding study.

The harmonization of common policies against capital flight can be enhanced by reducing terrorism-related cross-country differences that are inhibiting the convergence process. Some documented mechanisms to fighting terrorism have included, inter alia: education (Brockhoff et al., 2014), especially in the promotion of bilingualism (Costa et al., 2008); transparency (internal and external) (Bell et al., 2014); press freedom and publicity (Hoffman et al., 2013); military mechanisms (Feridun & Shahbaz, 2010); the assessment of behaviours towards terrorism (Gardner, 2007) and respect of the rule of law (Choi, 2010).

5. Conclusion and future directions

Building on previous literature, we set-out to tackle two main issues notably: (i) the effect of terrorism on capital flight and (ii) how this effect varies from one terrorism dynamic to another. We have investigated the effects of terrorism on capital flight in a panel 29 African countries for which data is available for the period 1987-2008. The terrorism dynamics entail domestic, transnational, unclear and total terrorisms. The empirical evidence is based on Generalised Method of Moments (GMM) with forward orthogonal deviations and Quantile regressions (QR). The latter methodology is based on the intuition that blanket policies may

[2] We are dividing the lagged estimated value by 3 because we have used three-year non-overlapping intervals.

not be effective unless they are contingent on initial capital flight levels and tailored differently across high- and low-'capital flight' countries. The following findings have been established. First, for GMM, domestic, unclear and total terrorisms consistently increase capital flight, with the magnitude relatively higher from unclear terrorism. Second, for QR: (i) the effect of transnational terrorism is now positively significant in the top quantiles (0.75^{th} and 0.90^{th}) of the capital flight distribution, (ii) domestic and total terrorisms are also significant in the top quantiles and (iii) unclear terrorism is significant in the 0.10^{th} and 0.75^{th} quantiles. Policy implications have been discussed. Further research inquiries devoted to extending the line of inquiry can focus on country-specific studies.

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