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Fighting terrorism in Africa: benchmarking policy harmonization

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Abstract

This study assesses the feasibility of policy harmonization in the fight against terrorism in 53 African countries with data for the period 1980-2012. Four terrorism variables are used, namely: domestic, transnational, unclear and total terrorism dynamics. The empirical evidence is based on absolute beta catch-up and sigma convergence estimation techniques. There is substantial absence of catch-up. The lowest rate of convergence in terrorism is in landlocked countries for regressions pertaining to unclear terrorism (3.43% per annum for 174.9 years) while the highest rate of convergence is in upper-middle-income countries in domestic terrorism regressions (15.33% per annum for 39.13 years). After comparing results from the two estimation techniques, it is apparent that in the contemporary era, countries with low levels of terrorism are not catching-up their counterparts with high levels of terrorism. As a policy implication, whereas some common policies may be feasibly adopted for the fight against terrorism, the findings based on the last periodic phase (2004-2012) are indicative that country-specific policies would better pay-off in the fight against terrorism than blanket common policies. Some suggestions of measures in fighting transnational terrorism have been discussed in the light of an anticipated surge in cross-national terrorism incidences in the coming years.

JEL Classification: C52; D74; F42; K42; O38
Keywords: Terrorism; Common policies; Development

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1. Introduction

The 2014 Global Terrorism Index (GTI, 2014, p. 13) has shown that terrorist activities have increased significantly after the 2011 Arab Spring. An eloquent case for illustration is the powerful Islamic State of Iraq and the Levant (ISIL) which now occupies more than a third and a half of the territories of Iraq and Syria respectively. The wave of terrorism from ISIL is currently being felt across the world, with some notable examples including, the: foiled Verviers-Belgium attacks of January 2015; January 2015 Charlie Hebdo attacks in Paris-France; Sydney-Australian hostage crisis in December 2014; failed February 2015 Australian attacks and November 2015 stream of terrorist attacks in Paris.

The African continent has also been experiencing a surge in terrorist activities in the post- 2011 Arab Spring era (Asongu & Nwachukwu, 2015, 2016a). In the post-Gaddafi era of Libya, a significant portion of the country is controlled by ISIL-affiliated terrorists' organisations. Moreover, there is now some consensus in academic and policy-making circles that the country has become a failed State, characterised with, *inter alia*: total anarchy and societal breakdown, with two rival governments desperately at war with many rebel factions to dictate the law of the land.

The 2015 Garissa University and 2013 Westgate shopping mall killings in Kenya have shown that the Somali Al-Shabab can still inflict substantial damages in the sub-region. In Tunisia, after a stream of political assassinations that has characterized the post- Arab Spring era, the newly elected government is now being confronted with a wave of attacks from ISIL-affiliated Islamic fundamentalists, notably, the: Bardo National Museum and Sousse attacks in March and June 2015 respectively. The Boko Haram of Nigeria has been extending its sphere of terrorism to neighboring countries like Chad, Cameroon and Niger. The November 2015 Radison Blu Hotel attack and Sinai Russian plane crash in Mali and Egypt respectively, are more contemporary examples of the threat terrorism poses as a development challenge to the continent.

The African terrain is also fertile for breeding terrorism because it is characterized by recurrent political strife and instability. Some contemporary cases for illustration include: Burundi, South Sudan and the Central African Republic. In essence, a decision by Pierre Nkurunziza of Burundi to run for a third term in office has cast a shadow of political violence/instability across the country. The South Sudanese civil war and political crisis that began in December 2013 has resulted in hundreds of thousands of citizens displaced across the country and thousands of death. The current situation of the Central African Republic is

similar to the past experiences of socio-political unrests: waves of failed coup d'états between 1996-2003 and the 2004-2007 Bush War.

The highlighted concerns are reminiscent of an atmosphere of political instability that has disrupted development on the continent over the past decades. Seven of the ten cases of substantial societal chaos and breakdown documented in contemporary development literature have been registered in Africa: Afghanistan, Angola, Burundi, Iraq, Liberia, Sierra Leone, Zaire/Congo, Somalia, Sudan, Syria (Asongu & Nwachukwu, 2015). Other important examples of political strife and civil wars include: Nigeria's failed political transitions in 2008 and 2011; the protracted politico-economic crisis in Zimbabwe; Kenyan 2007/2008 post-election crisis; Angola (1975-2002); Burundi (1993-2005); Chad (2005-2010); Côte d'Ivoire (with another crisis that resurfaced in 2011 after the 2002-2007 civil war and 1999 coup d'état); Liberia (1999- 2003); Sierra Leone (1991-2002); Sudan (with carnages in Durfur); the Congo Democratic Republic and Somalia.

There are two main strands in the literature on fighting terrorism. The first focuses on nexuses between macroeconomic variables and terrorism while the second is concerned with the mechanisms by which terrorism can be fought. Some studies in the strand on linkages between terrorism and macroeconomic variables include: the effect of terrorism on foreign direct investment (FDI) (Abadie & Gardeazabal, 2008); linkages between terrorism, economic development and resource-wealth in conflict management (Humphreys, 2005; Meierrieks & Gries, 2013; Choi, 2015); the incidence of terrorism on innovation (Koh, 2007) and the relevance of foreign aid in the effect of terrorism on development outcomes (Bandyopadhyay et al., 2014; Efobi et al., 2015).

The second strand has been focused on investigating mechanisms by which terrorism and political violence can be curbed. Some of the documented channels by which such can be achieved include: education (Brockhoff et al., 2014), especially by means lifelong learning (Asongu & Nwachukwu, 2016b) and bilingualism (Costa et al., 2008); the role of good governance (Asongu & Kodila-Tedika, 2016); publicity and press freedom (Hoffman et al., 2013); military mechanisms (Feridun & Shahbaz, 2010); the relevance of geopolitical fluctuations (Straus, 2012); strategies founded on investigating terrorism behaviour (Gardner, 2007) and transparency (Bell et al., 2014).

To the best of our knowledge, the engaged literature has stopped short of exploring the possibilities of formulating and implementing common policies against terrorism. Moreover, ineffectiveness in the fight against terrorism has been due to the absence of common internationally recognised long-term and comprehensive policies on counterterrorism

(Omand, 2005). This study fills the highlighted gap by assessing the feasibility of and timelines to common policy initiatives against domestic, transnational, unclear and total terrorism. The intuition underlying the assessment builds on recent theoretical underpinnings motivating the prediction of the Arab Spring based on negative economic and institutional signals, *inter alia*: inflation, unemployment and bad governance (Asongu & Nwachukwu, 2016a). In essence, the underpinnings are relevant to this study because terrorism is a negative economic signal. The theoretical underpinning of the analysis is typically in accordance with cross-country convergence literature that has been substantially documented within the framework of neoclassical growth models (Solow, 1956; Swan, 1956; Baumol, 1986; Barro, 1991; Mankiw et al., 1992; Barro & Sala-i-Martin, 1992, 1995; Fung, 2009) and recently extended to other development fields, notably: financial markets (Narayan et al., 2011; Bruno et al., 2012); intellectual property rights (IPRs) harmonization (Asongu, 2013a; Andrés & Asongu, 2013a); common policies in the fight against African capital flight (Asongu, 2014a) and inclusive human development (Mayer-Foulkes, 2010; Asongu, 2014b).

In order to put the above theory into more perspective, it is reasonable to expect that the elimination of cross-country differences in terrorism dynamics would lead to common policy initiatives for two main reasons. First, evidence of convergence in terrorism implies that countries with lower levels of terrorism are catching-up their counterparts with higher levels of terrorism. This implies that common policy initiatives against terrorism are feasible. Second, with complete catch-up in terrorism, cross-country differences in terrorism are no longer apparent such that, the underlying feasible common policy initiatives can be implemented without distinction of nationality, with the timeline to complete harmonization contingent on the 'time to full catch-up' (see Asongu, 2013b; Andrés & Asongu, 2013).

We strongly believe that inquiries should not be exclusively limited to acceptance or refutation of existing theories. Hence, the positioning of this inquiry is also within the framework of theory-building because we are substantiating recent methodological innovations based on reversed Solow-Swan. In essence, whereas the theoretical underpinnings of convergence have exclusively been limited to catch-up in positive signals, this study extends a new stream of literature on catch-up in negative signals (Asongu & Nwachukwu, 2016a; Asongu, 2014a). We argue that, while cross-country policy harmonization based on positive signals has been substantially documented, it is more relevant to initiate common policies based on negative signals because these are policy syndromes by conception and definition. Therefore, this study is also in accordance with Costantini and Lupi (2005, p. 2), Narayan et al. (2011, p. 2772) and Asongu (2014a, p. 336), by arguing that theory-building

and reporting of facts based on sound intuition are not useless scientific activities because room for improvements in scholarship would be substantially limited if studies were exclusively limited to either accepting or refuting exiting theories.

As documented by Islam (1995, 2003) and Narayan et al. (2011), it is not very likely to find convergence within a heterogeneous set of countries. The richness of our data (1980-2012) enables us to disaggregate the dataset into fundamental characteristics of African development, notably: income levels, regional proximity, legal origins, religious domination, resource wealth, landlockedness and political stability. The choice of these fundamental characteristics is consistent with studies on common policy initiatives on the continent (Asongu, 2013b, 2014a). Moreover, we present a statistical justification for the fundamental characteristics before engaging them in the empirical section.

Two methodologies are adopted, namely: the *beta* catch-up and *sigma* convergence approaches. Beta catch-up is the reduction in cross-country dispersions within a panel of countries whereas; sigma convergence refers to cross-sectional reduction in dispersions across years. Beta catch-up is a necessary but not a sufficient condition for sigma convergence due to concerns about multiple equilibria and initial endowments. For simplicity, we use the terms catch-up and convergence interchangeably throughout the study. The motivation for employing both empirical strategies is to ensure robustness on the one hand and provide room for more policy implications on the other hand.

In the light of the above, this study has a twofold contribution to the literature. First, by employing recent methodological innovations on reverse Solow-Swan, it contributes to theory-building in policy harmonization based on negative macroeconomic and institutional signals. Second, it contributes to the literature on fighting African conflicts by assessing the feasibility and harmonization of common policies initiatives against terrorism.

The rest of the study is structured as follows. Section 2 presents and links the theoretical underpinnings to existing conflict resolution theories. The data and methodology are covered in Section 3. Section 4 discusses the empirical results while Section 5 concludes.

2. Intuitions for the empirics and linkage with conflict resolution

2.1 Theoretical underpinnings

Consistent with the underlying literature on policy harmonization (Asongu & Nwachukwu, 2017a), in the post-Keynesian era, the initial economic growth theories that gained prominence with the resurfacing of the neoclassical revolution have created favourable conditions for convergence in development outcomes among countries. According to Mayer-

Foulkes (2010), extension of market equilibrium concepts formed the bases for new economic growth theories that estimated absolute convergence. Within this framework, convergence among countries resulted from policies conducive to 'free-market competition' that articulated catch-up processes. Seminal literature on convergence established the absence of catch-up (or absolute divergence) in per capita income (Barro, 1991). Pritchett (1997) confirmed the absence of convergence among countries. The bulk of studies within this strand of the literature is consistent with the view that irrespective of differences in initial income levels, convergence in income levels is apparent at a common state or each country's long run equilibrium, within the framework of a neoclassical (or exogenous) model of growth. On the other hand, consistent with the endogenous theory of growth, there are at least two justifications for the unfeasibility of income convergence, notably: the possibility of multiple equilibria and differences in initial endowments.

With the above in mind, the intuition for this study is consistent with the income catch-up strand of the literature that has been recently extended to other fields of economic development. In essence, studies using theoretical foundations of convergence have been substantially documented within the context of neoclassical growth studies that were originally framed by the seminal works of Barro (1991), Barro and Sala-i-Martin (1992, 1995), Mankiw et al. (1992) and Baumol (1986). Moreover, a recent stream of the literature has been devoted to extending the theoretical underpinnings of income convergence (Swan, 1956, Solow, 1956) to other economic development fields. Accordingly, whereas a consensus on an income convergence theory has been reached in scholarly circles, extension of the theoretical underpinnings of income catch-up to other development outcomes is a relatively new area of scholarship. The development of this new stream of literature is fundamentally motivated by at least two main arguments. First, catch-up should be beyond income convergence (Mayer-Foulkes, 2010; Asongu, 2014b). Second, catch-up should not be exclusively limited to positive development outcomes (Asongu & Nwachukwu, 2016a). It follows from common sense that catch-up should be assessed both from positive and negative signals. Moreover, it can also be applied to other indicators of human development. In essence, the policy and scholarly challenge of accounting for the above perspectives is both consistent with: empirical analysis for theory-building and assessment of the validity of existing theories within the frameworks of other development outcomes.

The highlighted challenge has motivated an evolving stream of literature, devoted to extending the theoretical underpinnings of catch-up literature to other development outcomes, *inter alia* in: (i) financial markets (Narayan et al., 2011; Bruno et al., 2012; Asongu, 2013b),

illicit capital flight (Asongu, 2014a), IPRs harmonization (Andrés & Asongu, 2013a; Asongu, 2013a) and negative development signals like chaotic inflation, unemployment and bad governance (Asongu & Nwachukwu, 2016a). The present study is closest to the last stream on catch-up in negative economic and institutional signals. How it extends the underlying stream within the framework of terrorism has already been discussed in the introduction. But prior to engaging the empirical framework, it is relevant to articulate how the discussed theoretical underpinnings align with existing theories on conflict resolution.

2.2 Linkage between theoretical underpinnings and existing conflict resolution theories

In accordance with Asongu and Nwachukwu (2017a), the nexus between convergence in terrorism and the theoretical underpinnings of conflict resolution is based fundamentally on the intuition that with diminishing cross-country differences in terrorism, sampled countries can easily adopt common initiatives towards the resolution of conflicts because the threat of terrorism is becoming similar across countries. Some channels by which conflicts can be resolved are articulated by the Conflict Management Model (CMM) of Thomas-Kilman and the Social Control Theory (SCT) of Black. The highlighted theoretical underpinnings which have been substantially documented by Akinwale (2010, p. 125) have recently provided the theoretical basis for a stream of conflict management literature, notably: in the fight against terrorism (Asongu et al., 2015) in developing countries and political instability/violence (Asongu & Nwachukwu, 2016b) in Africa.

The CMM articulates that intentions of strategic nature that are most likely to revolve around assertiveness and cooperation, yield five conflict management styles, namely: avoidance, accommodation, competition, compromise and collaboration. On the other hand, the SCT postulates that linkages among organisations, groups and individuals substantially influence the exercise of one of the five principal instruments of social control, namely: tolerance, settlement, self-help, negotiation and avoidance. This narrative is in accordance with the conflict management literature (see Black, 1990; Borg, 1992; Thomas, 1992; Volkema & Bergmann, 1995).

The engaged theoretical underpinnings align with the present inquiry in the perspective that favourable conditions like cooperation and collaboration are more likely to be apparent in the face of decreasing cross-country differences in terrorism dynamics. In other words, with diminishing cross-country dispersions in terrorism dynamics, sampled countries are more likely to adopt common policies in the fight against terrorism because the

phenomenon is becoming indifferent across countries. This is essentially because countries with low levels of terrorism are catching-up their counterparts with higher levels.

2.3 Clarification of concepts

2.3.1 Convergence

As documented in mainstream convergence literature (Islam, 2003; Asongu, 2014b), catch-up can be understood from various facets, notably: convergence across countries versus (vs) convergence within an economy; convergence in income vs. convergence in terms of growth; sigma-convergence vs. beta-convergence; absolute (unconditional) vs. conditional convergence; club or local convergence vs. global convergence; total factor productivity (TFP) convergence vs. income convergence and stochastic-convergence vs. deterministic-convergence. According to the account, some linkages also exist between the plethora of definitions and adopted methodologies. However, this correspondence is not unique given that: (i) formal and informal cross-section techniques; (ii) time series and panel-based approaches (in part) have all assessed *beta*-convergence from either conditional or unconditional perspectives. Moreover, the techniques have for the most part, emphasised cross-country convergence on the one hand and per capita income convergence on the other hand. Furthermore, the panel technique and cross-section approach have been employed to investigate TFP and club-convergences. In essence, the cross-section technique has also been employed within the framework of sigma-convergence. Conversely, the time series technique has been employed to assess convergence across economies and within an economy. Lastly, the distribution technique has evolved beyond investigating sigma-convergence to engaging and assessing the entire shape of distributions.

The beta-convergence approach is required to assess catch-up in both income levels and growth rates. This is motivated by the assumption that decreasing returns are articulated by higher marginal capital productivity in less developed or capital-poor nations. According to the narrative, with identical rates of savings, poorer economies are bound to experience more growth because of higher marginal productivity in capital. Within this framework, a negative correlation is expected between initial levels of income and growth rates. This catch-up scenario is known as *beta*-convergence. A disadvantage of the approach however is that reduction in dispersions cannot necessarily be concluded from an initial growth regression that reveals a negative beta. This empirical inconvenience has led to the rise of an alternative concept known as sigma-convergence, where sigma represents the decreasing cross-country standard deviations across years. In spite of the highlighted draw-back, beta-convergence is a

necessary but not a sufficient condition for *sigma*-convergence. Hence, researchers have focused more on the concept of *sigma*-convergence in order to address the underlying issues in *beta*-convergence (Asongu, 2014b). Nonetheless some researchers have also continued to employ the beta-convergence technique because it discloses information about structural parameters of growth, which is not provided by the distribution approach. In light of the above, both the sigma and beta catch-up approaches have been employed in recent literature in order to provide more room for robustness (Asongu, 2017a).

2.3.2 Absolute convergence versus conditional convergence

It is relevant to clearly articulate the concepts of absolute and conditional convergences. Consistent with the underlying literature (Asongu, 2013a; Narayan et al., 2011; Asongu & Nwachukwu, 2017a), absolute convergence (AC) is fundamentally premised on common initiatives, policies and factors which include, *inter alia*: common monetary areas and economic communities. However, the framework of this inquiry extends beyond common economic/monetary areas to common policies against terrorism across countries. Hence, AC is an indication that nations share some common fundamental features in terrorism occurrences such that, disparities across nations are only apparent with respect to initial terrorism levels. Hence, the absence of AC could be traceable to disparities in initial levels. On the other hand, evidence of terrorism implies that common fundamental characteristics existing among countries are facilitating the convergence process.

Conversely, conditional convergence (CC) shows the type of catch-up in which the nation's steady state or long-term equilibrium is contingent on structural and institutional features that are fundamental to economic/currency unions. Therefore, CC is likely to occur when there are cross-country differences in factors that determine the underlying dependent variable (terrorism). It follows that if sampled nations differ in institutional and structural features that are exogenous to terrorism, catch-up may be apparent.

3. Data and methodology

3.1 Data

We examine a panel of 53 African countries for the period 1980-2012 with data from the Global Terrorism Database, African Development indicators (ADI) of the World Bank and terrorism incidents from Enders et al. (2011), Gailbulloev et al. (2012) and Asongu et al. (2017). The periodicity ends in the year 2012 because of constraints in data availability in,

notably: (i) macroeconomic and institutional indicators from the ADI of the World Bank on the one hand and (ii) terrorism variables from Enders et al. (2011) and Gailbulloev et al. (2012) on the other hand[1]. Four different but related terrorism dependent variables are employed, namely: domestic, transnational, unclear and total terrorism dynamics. The dependent variable records the number of yearly terrorism incidents a country experiences. In order to avoid mathematical issues of log-transforming zeros and correct for the positive skew in the data, we are consistent with the underlying literature (Choi & Salehyan, 2013; Bandyopadhyay et al., 2014; Efobi & Asongu, 2016) in taking the natural logarithm of terrorism incidents and adding one to the base.

Terrorism is defined in this study as the actual and threatened use of force by subnational actors with the purpose of employing intimation to meet political objectives (Enders & Sandler, 2006). Terrorism-specific definitions are from Efobi et al. (2015, p. 6). Domestic terrorism "*includes all incidences of terrorist activities that involves the nationals of the venue country: implying that the perpetrators, the victims, the targets and supporters are all from the venue country*" (p.6). Transnational terrorism is " *terrorism including those acts of terrorism that concerns at least two countries. This implies that the perpetrator, supporters and incidence may be from/in one country, but the victim and target is from another*". Unclear terrorism is that, "*which constitutes incidences of terrorism that can neither be defined as domestic nor transnational terrorism*" (p.6). Total terrorism is the sum of domestic, transnational and unclear terrorism.

No independent variables are employed because adopted estimation techniques are sigma convergence and unconditional beta convergence. In essence, the conditional beta convergence approach which is contingent on structural and institutional control variables is not adopted because of issues associated with the estimation technique, notably: differences initial endowments and multiple equilibria.

Given that the Generalised Method of Moments (GMM) estimation technique is adopted for the absolute beta convergence approach, we are faced with three major constraints. First, a basic condition for the employing of the GMM approach is that the number of years in the time series (T) should be higher than the number of countries (N).

[1] The data for the paper was collected in the year 2015. During this year, the stylized facts were built on the GTI (2014). At the time of the study, the terrorism data from Enders et al. (2011) and Gailbulloev et al. (2012) were only available up to the year 2012. It is important to note that the Global Terrorism Database does not reflect dynamics in domestic, transnational, unclear and total terrorism. These dynamics are only computed by Enders and co-authors.

Hence, T<N. Second, a minimum of 5 periods is required for the employment of GMM. Therefore, T≥5. Third, the sub-sample with the lowest number of countries is North Africa with six countries (N=6). We address the three constraints by narrowing the sample to period 1983-2012 and employing 6 year data averages or non-overlapping intervals such that, the number of periods is equal to 5 year (T=5). Hence adopted T is less than N in North Africa (N>T for the North African sample). The use of data averages is also motivated by that fact that it is unlikely to model catch-up using annual data because of short-run or business cycle disturbances that may loom substantially (Islam, 1995, p. 323). Conversely, the computation of sigma convergence does not require the employment of non-overlapping intervals (NOI) because the time series properties need to be exploited as much as possible for a comprehensive representation of standard deviations across time.

3.2 Determination of fundamental characteristics

This section provides the criteria used in selecting fundamental characteristics of African development, based on: legal origins (English common law vs. French civil law), political stability (conflict-affected vs. politically stable), resource-wealth (resource-rich vs. resource-poor), income levels (low- vs. middle-income), regional proximity (SSA vs. North Africa), openness to sea (landlocked and coastal) and religious domination (Islam vs. Christianity). These fundamental features are consistent with Asongu (2014ab, 2017ab).

First, the premise of legal origin in distinguishing African countries has been substantially documented in contemporary development literature, notably on: (i) the quality of institutions (La Porta et al., 1998, 1999); (ii) adaptation to evolving economic conditions (Beck et al., 2003) and (iii) education, openness and economic growth (Agbor, 2015). The institutional advantage English common law countries may have over their French civil law counterparts (La Porta et al., 1998, 1999) has been confirmed in more contemporary African literature (Asongu, 2012ab). The advantage in financial development established by Beck et al. (2013) has been confirmed within the frameworks educational performance and economic growth by Agbor (2015). In essence, the logic underpinning this classification is that, the institutional web of formal rules, informal norms and enforcement characteristics within a legal system influence how terrorism is fought by means of institutional regimes and government quality (Li, 2005; Choi, 2010; Lee et al., 2013). Classification of countries within this category is based on information from La Porta et al. (2008, p. 289).

Second, with regard to the classification of countries that are affected by conflicts, some practical concerns emerge in terms of assigning a country to this category in a non-

arbitrary and exclusive manner. In essence, since it is difficult for a country to be completely free from conflict, it is relevant to distinguish countries by focusing on the significance and periodicity of political instability. In this light, two strands merit emphasis: 'civil war' and 'political strife' groups. The groups on civil war consists of: Angola (1975-2002); Burundi (1993-2005); Chad (2005-2010); the Central African Republic (with the 2004-2007 Bush War and waves of aborted coup d'états between 1996- 2003); the Democratic Republic of Congo; Côte d'Ivoire (1999 coup d'état, 2002-2007 civil war, rekindled in 2011); Liberia (1999-2003); Sierra Leone (1991-2002); Sudan and Somalia. With regard to the second group, though formal features of civil war may not be apparent, Nigeria and Zimbabwe are included in the study because of the magnitude of their internal strife. From common sense and logic, civil conflicts and political strife harbor favorable conditions for the proliferation of terrorism.

Third in the resource-wealth category, two concerns arise in selecting petroleum-exporting nations. On the one hand, a nation could qualify for this category only for a small fraction of the sampled period, either due to a recent discovery of oil reserves or a decline in production. On the other hand, some nations also display macroeconomic features that are similar to those of petroleum-exporting nations. These include countries that substantially depend on mineral-intensive industries (e.g. Botswana). In order to address this concern, we exclusively select nations for which exports have dominated by petroleum for at least a decade of the sampled periodicity. Hence, the study takes a minimalistic approach by selecting exclusively petroleum-exporting countries that meet the criteria, namely: Angola, Algeria, Chad, Cameroon, Congo Republic, Gabon, Equatorial Guinea, Nigeria, Libya and Sudan.

The fourth strand on wealth-effects has a twofold motivation. On the one hand, high-income countries have been documented to have more resources in dealing with the negative effects of terrorism without engendering substantial negative externalities (see Gaibulloev & Sandler, 2009). On the other hand, the wealth of nations in Africa has also been documented to be exogenous to government quality (Asongu, 2012c), which is needed in the fight against terrorism. The classification of income-levels is in accordance with the Financial Development and Structure Database of the World Bank. These include: low-, middle-, 'lower middle'- and 'upper middle'-income countries.

Regional proximity is categorized in terms of SSA and North Africa for two main reasons. First, North African countries exclusively consist of Islamic states from which Islamic fundamentalism (which is a significant cause of terrorism) is likely to emerge. Second, consistent with Boyce and Ndikumana (2008), this distinction (which is in

accordance with World Bank's regional classification) provides room for more policy implications.

In the sixth stand, unlike landlocked countries, nations that are open to the sea may provide more networking and movement opportunities for terrorism. Moreover, landlocked countries have been documented to be associated with lower institutional quality levels (Arvis et al., 2007) and hence could be more linked to political strife and civil wars that breed conditions for terrorism.

The classification of religious dominations is based on the Central Intelligence Agency (CIA) World Fact book (CIA, 2011). As shown in Appendix 1, African countries may qualify for more than one category. Contrary to Weeks (2012), we are consistent with Asongu (2017a) in not imposing any constraints on categorical priority. Hence, a country may appear in more than one category as long as the country complies with the relevant categorical characteristics.

3.3 Statistical validity of fundamental characteristics

It is not enough to select fundamental characteristics exclusively with intuition and justification from existing literature. This is essentially because the validity of fundamental characteristics may be contingent on the dependent variables on which they are motivated. Hence, we substantiate the choice of fundamental features by providing their statistical validities. For this purpose, we first present the validity of distinguishing African countries in terms of the discussed categories and then analyse the relevance of distinguishing terrorism variables within categories. Whereas Appendix 2 addresses the first concern, the second is tackled in Appendix 3. The corresponding 'difference in means' tests overwhelmingly show that the fundamental characteristics are different on the one hand and on the other hand, the terrorism variables within categories are also statistically different.

3.4 Estimation technique

3.4.1 Beta convergence

In accordance with Narayan et al. (2011) and Asongu and Nwachukwu (2017a), beta convergence can be estimated with the GMM approach to establish catch-up in selected dependent variables. Moreover, the estimation strategy is in line with the bulk of cross-country evidence on income catch-up that has been investigated by pioneering papers with neoclassical growth models (Barro & Sala-i-Martin, 1992, 1995; Mankiw et al., 1992; Baumol, 1986).

As documented by Fung (2009), the two equations below are standard procedures for examining conditional beta catch-up if $W_{i,t}$ exhibits strict exogeneity.

$$\ln(T_{i,t}) - \ln(T_{i,t-\tau}) = \beta \ln(T_{i,t-\tau}) + \delta W_{i,t-\tau} + \eta_i + \xi_t + \varepsilon_{i,t} \quad (1)$$

$$\ln(T_{i,t}) = a \ln(T_{i,t-\tau}) + \delta W_{i,t-\tau} + \eta_i + \xi_t + \varepsilon_{i,t} \quad (2)$$

where, a = 1+ β, $T_{i,t}$ is the measure of a terrorism dynamic (domestic, transnational, unclear or total) in country *i* at period *t*. τ is tau, $W_{i,t}$ is a vector of determinants of terrorism, η_i is a country-specific effect, ξ_t is a time- specific constant and $\varepsilon_{i,t}$ an error term. Owing to decreasing marginal returns from the neoclassical growth model, a negative and statistically significant *beta* coefficient in Eq. (1) implies that countries relatively close to their steady state in terrorism activities will experience a slowdown in terrorism activities known as conditional convergence (Narayan et al., 2011, p. 2773; Asongu & Nwachukwu, 2016a). In the same light, as sustained by Fung (2009, p. 59), if $0 < |a| < 1$ in Eq. (2), then $T_{i,t}$ is dynamically stable around the path with a trend growth rate similar to that of W_t and with a height relative to the level of W_t. Indicators contained in $W_{i,t-\tau}$ and the individual effects η_i are proxies for the long-term level *terrorism* is converging towards. In essence, the country-specific effect η_i measures other factors determining a country's steady state that are not captured by $W_{i,t-\tau}$.

The underlying literature maintains that conditions for catch-up are valid if and only if $W_{i,t}$ is characterised by strict exogeneity. Unfortunately, this is not the case in reality because where components of $W_{i,t}$ influence terrorism, the reverse effect is also possible. Within this framework, there is a possibility of reverse causality because terrorism also affects macroeconomic and institutional outcomes. In essence, we have seen from the engaged literature that terrorism has substantial macroeconomic consequences. Therefore, the study is confronted with a concern of endogeneity because the error term ($\varepsilon_{i,t}$) is correlated with components of $W_{i,t}$. This is the case with conditional beta catch-up that requires a conditioning information set (or control variables) for the modelling exercise. Within the framework of unconditional or absolute beta catch-up where $W_{i,t}$ is not required, the concern about endogeneity is still apparent between the errors are correlated with country-specific effects (η_i). Moreover, the time- and country-specific effects are likely to be correlated with other variables in the equation. This is probable to be most apparent when lagged dependent

variables are involved in the equations. A mechanism by which the underlying issues could be addressed consists of eliminating country-specific effects by taking first differences. Therefore, Eq. (2) becomes:

$$\ln(T_{i,t}) - \ln(T_{i,t-\tau}) = a(\ln(T_{i,t-\tau}) - \ln(T_{i,t-2\tau})) + \delta(W_{i,t-\tau} - W_{i,t-2\tau}) + (\xi_t - \xi_{t-\tau}) + (\varepsilon_{i,t} - \varepsilon_{i,t-\tau}) \qquad (3)$$

Unfortunately, the Eq. (3) can be still not be estimated by Ordinary Least Squares (OLS) because it would result in biased estimators because of possible correlations between the error terms of lagged terrorism variables. Arellano and Bond (1991) have proposed the GMM technique in order to deal with the underlying correlation between the error term and lagged dependent variable. The procedure consists of employing lagged levels of the regressors as instruments in exploiting orthogonal conditions between the lagged dependent variable and error term.

Given sample-bias concerns associated with the difference GMM approach, the system estimator has been developed by Arellano and Bover (1995) and Blundell and Bond (1998) in order to correct the problem. The system estimation procedure employ Equations 2 and 3 simultaneously by using lagged levels of the variables as instruments in the differenced equation and lagged differences of the variables as instruments in the level equation, thus exploiting all the orthogonal or parallel conditions between the error term and the lagged terrorism variables. Hence, for the above reason we employ both the difference and system estimators but give preference to the system estimator in event of conflict of interests in the results. This preference is in accordance with Bond et al. (2001, pp. 3-4)[2].

It is important to note that the system GMM approach builds on some restrictions on the dynamic process because according to Blundell and Bond (1998, pp. 115-116), the *difference* estimator is associated with: large finite sample bias and poor precision in simulation studies. Therefore, restrictions on the initial conditions process are employed in the *system* approach to enhance properties of the *difference* estimator. The first restriction justifies the employment of lagged differences as instruments in the level equation, in addition to lagged levels as instruments in the difference equation. "*The second type of restriction validates the use of the error components GLS estimator on an extended model that conditions on the observed initial values*" (Blundell & Bond, 1998, pp. 116).

[2] "*We also demonstrate that more plausible results can be achieved using a system GMM estimator suggested by Arellano & Bover (1995) and Blundell & Bond (1998). The system estimator exploits an assumption about the initial conditions to obtain moment conditions that remain informative even for persistent series and it has been shown to perform well in simulations. The necessary restrictions on the initial conditions are potentially consistent with standard growth frameworks and appear to be both valid and highly informative in our empirical application. Hence we recommend this system GMM estimator for consideration in subsequent empirical growth research*". (Bond et al., 2001, pp. 3-4).

While we are aware of fact that the Roodman (2009ab) GMM extension of Arellano and Bover (1995) may have better estimation properties, we do not use the xtabond2 Stata command for the purpose of these empirics for two main reasons. First, the estimation procedure we are employing is an innovation of the GMM technique that has not been properly worked-out with the use of forward orthogonal deviations as employed by Roodman (2009ab). Second, the Roodman approach is tailored to restricting identification or limiting instrument proliferation by, *inter alia*, the collapse of instruments in the procedure. Hence, the procedure is not specifically based on employing data averages or non-overlapping, which are essential in the: (i) mitigation of short-run or business cycle disturbances and (ii) computation of the implied rate of catch-up (see Islam, 1995, p.323).

In the light of the above, the adopted system GMM approach in this study combines Eq. (2) and (3). In the specification, we choose the *two-step* GMM procedure to account for heteroscedasticity in the residuals. Accordingly, the *one-step* process is homoscedasticity-consistent. In line with Tchamyou and Asongu (2017), the hypothesis of the absence of autocorrelation in the residuals is very crucial because lagged regressors are to be used as instruments. Therefore, the estimation validity depends substantially on the hypothesis that lags of other independent regressors and the dependent variable are valid instruments in the regressions. In essence, we expect the first-order autocorrelation (AR [1]) test of the residuals to be significant while the second-order correlation (AR [2]) test to be insignificant. Only the latter test which is more relevant is reported because it assesses the presence of autocorrelation in difference. The Sargan overidentifying restrictions (OIR) test is employed to investigate the validity of instruments.

In the light of the above, there at least four advantages associated with the system GMM estimation. It: is appropriate when N>T; controls for endogeneity in all regressors; corrects for small sample biases in the difference estimator and does not eliminate cross-country differences.

As established by Islam (1995, p. 323), yearly periodicities are not appropriate for assessing convergence. As we have alluded to earlier, the author maintains that in such brief time spans, short-run disturbances may loom substantially. Hence, considering the 30 year periodicity, we use 6 year non-overlapping intervals (NOI)[3]. Justifications for the choice of the six year NOI have been provided in the data section.

[3] Accordingly, we have five six-year non-overlapping intervals: 1983-1988; 1989-1994; 1995-2000; 2001-2006; 2007-2012.

In order to assess the decreasing cross-country variations in dynamics of terrorism, the implied rate of convergence is computed by calculating *a*/6. Therefore, we divide the estimated lagged terrorism variable by 6 because six-year NOI have been used to reduce short-term disturbances. Hence, τ is equal to 6. It is interesting to note that the criterion used to examine evidence of catch-up is '$0 < |a| < 1$', which means that the absolute value of the estimated lagged terrorism indicator is less than one but greater than zero. This implies that past variations have less proportionate effect on future differences. In other words, the left-hand-side of Eq. (3) is moving toward equilibrium or decreasing over time across countries.

We devote space to eliciting the adopted convergence criteria. Accordingly, in the standard GMM approach, the estimated lagged value is a from which 1 is subtracted to obtain β (β= *a*-1). In the same vein, $\beta < 0$ could also be employed as information criterion for *beta*-convergence. Within the framework of this study, for the purpose of simplicity and clarity, *a* could be reported instead of β and the first information criterion '$0 < |a| < 1$' used to assess evidence of catch-up. This latter interpretation is consistent with recent convergence literature (Prochniak & Witkowski, 2012a, p. 20; Prochniak & Witkowski, 2012b, p. 23; Asongu & Nwachukwu, 2016a, 2017a).

In the choice between absolute beta and conditional beta convergence, the study adopts the former method because of shortcomings in the latter methodology already discussed in Section 2. Accordingly, beside the concern about multiple equilibria, conditional convergence depends on variables in the conditioning information set. Hence, the model depends on the choice of control variables employed in the modelling exercise. Moreover, the beta catch-up is a necessary but not a sufficient condition for the occurrence of sigma convergence.

3.4.2 Sigma convergence

Similar to the case of absolute beta catch-up, sigma convergence is estimated without a conditioning information set. It represents yearly decreasing dispersions in terrorism dynamics. In other words, sigma convergence can be inferred when yearly cross-country differences in terrorism activities are decreasing over time. Hence, contrary to the beta approach, non-overlapping intervals or data averages are not employed for sigma convergence modeling.

Sigma or cross-sectional convergence is represented by Eq. (4) below.

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(T_i - \mu)^2} \qquad (4)$$

where $\mu = \frac{1}{N}\sum_{i=1}^{N} T_i$

where, σ is a standard deviation, N is the number countries in a given year, T_i is a terrorism indicator for country i, μ is the mean for a given year. The procedure for estimating *sigma* convergence denoted by Eq. (4) consists of observing the evolution in standard deviations across time. A decreasing tendency implies convergence.

4. Presentation of results

4.1 Beta convergence

Three concerns are investigated in this section, notably: (i) examination of evidence of catch-up or decreasing dispersions in terrorism dynamics (domestic, transnational, unclear and total); (ii) computation of the implied rate of catch-up or degree of reduction in dispersions and (iii) calculation of the time required for full catch-up or a complete elimination of cross-country differences in the underlying terrorism dynamics. Tackling the first concern provides insights into the feasibility of common policies based on similar cross-country tendencies in the terrorism indicators. Addressing the second concern provides information on the degree of similarity in the underlying terrorism tendencies. Investigating the third concern informs the study about the time needed for completeness in underlying common tendencies or full elimination of cross-country dissimilarities. Put in other terms, whereas evidence of catch-up means that common cross-country policies against terrorism are feasible, full catch-up implies that underlying feasible policies can be enforced among sampled countries within a fundamental characteristic without distinction of locality or nationality.

Table 1 which summarizes the results presented in Table 2 provides information on how the three underlying issues in this section are addressed. As we have alluded to earlier, the absolute catch-up results in Table 2 are estimated exclusively with the lagged terrorism indicator as independent variable (with control for time effects). Panel A of Table 1 discloses findings of difference GMM whereas Panel B shows results of the system GMM. Both panels are further sub-divided to disclose specific findings corresponding to domestic terrorism (A1 or B1), transnational terrorism (A2 or B2), unclear terrorism (A3 or B3) and total terrorism

(A4 or B4). The same chronology applies with Table 2 which discloses full results on which the summary in Table 1 is established. Consistent with the discourse in the methodology on apparent advantages of the system estimator compared to the difference estimator, preference is given to the system GMM estimator when conflicting results are apparent.

In order to examine the validity of estimated models and three catch-up concerns discussed above, three tests are performed, namely: (i) the Arellano and Bond autocorrelation test that investigates the null hypothesis of the absence of autocorrelation; (ii) the Sargan over-identifying restrictions (OIR) test which assesses the validity of instruments and (iii) the Wald test for the joint significance of estimated coefficients which investigates the overall significance of estimated models. In the light of these criteria, for an estimated model to be valid, the: (i) null hypothesis of the second order Arellano and Bond autocorrelation test (AR(2)) in difference for the absence of autocorrelation in residuals should not be rejected; (ii) alternative hypothesis of the Sargan OIR should be rejected because it is the position that the instruments are not valid or correlated with the error term and (iii) null hypothesis of the Wald test for the joint validity of estimated coefficients should be rejected because it argues for the position that estimated coefficients are not jointly significant. We do not control for time effects in 10 of the 136 regressions because of issues in degrees of freedom. Moreover, unclear terrorism is not modelled in the North African sub-sample due to constraints in degrees of freedom.

From the findings in Table 2, most of the estimated models are overwhelmingly significant with: (i) on the one hand, rejection of null hypotheses of the AR(2) and Sargan OIR tests and (ii) on the other hand, failure to reject the null hypothesis of the Wald test. Moreover, we have also ensured that for most of the estimated models, the rule of thumb needed to restrict over-identification or instrument proliferation is respected: notably, the number of instruments is less than the number of associated countries, for the most part.

We devote space to providing insights into the computation of catch-up rates and time to full catch-up in Table 1. Given an estimated coefficient for an initial lagged terrorism value of 0.706 that is significant with no autocorrelation in the residuals and has valid instruments: (i) the catch-up rate is 11.70% ([0.706/6]×100) and (ii) the length of time needed for full catch-up is 51.28 years (600%/11.70%). Therefore 51 years and approximately 102 days are needed to achieve 100% catch-up for an estimated initial value of 0.706 that is consistent with the convergence information criterion: $0 < |a| < 1$.

The following findings can be established. First, system GMM estimates are more significant compared to corresponding difference GMM estimators. Hence, as emphasised in the methodology section, in the presence of conflicting results, preference is given *system* estimators relative to *difference* estimators. Second, in domestic terrorism regressions, the following significant findings are apparent: Low income countries, with a catch-up rate of 8.75% per annum (pa) and time to full convergence of 68.57 years (yrs); (ii) corresponding values for lower-middle-income countries are 7.78% p.a and 77.12 yrs; (iii) upper-middle-income countries (15.33% pa for 39.13 yrs); (iv) French civil law countries (13.23% pa for 45.35 yrs); (v) Landlocked countries (11.90% pa for 50.42 yrs) and (vi) conflict-affected countries (14.10% pa for 42.55 yrs). Third, for transnational terrorism, the following catch-up rates and periods needed to achieve full catch-up are apparent: (i) Low income countries (5.98% pa for 100.3 yrs); (ii) low-middle income countries (10.91% pa for 54.99 yrs); (iii) upper-middle income countries (11.73% pa for 72.20 yrs); (iv) French civil law countries (7.66% pa for 78.32 yrs); (v) conflict-affected countries (7.30% pa in 82.19 yrs) and (vi) Islam-oriented countries (6.85% pa in 87.59 yrs). Fourth, for unclear terrorism, catch-up rates and periods needed to achieve full catch-up are: (i) middle-income countries (11.93% pa for 50.29 yrs); (ii) upper-middle income countries (11.73% pa for 51.15 yrs); (iii) Landlocked countries (3.43% pa for 174.9 yrs); (iv) Sub-Saharan Africa (8.65% pa for 69.36 yrs) and (v) Islam-dominated countries (9.70% pa for 61.85 yrs). Fifth for total terrorism, the following catch-up rates and periods needed to achieve full catch-up are established: (i) lower-middle income (9.50% pa for 63.15 yrs); (ii) Landlocked countries (9.35% pa for 64.17 yrs); (ii) conflicted-affected countries (12.23% pa for 49.05 yrs) and (iv) North Africa (14.85% pa for 40.40 yrs).

The lowest rates of terrorism is in landlocked countries for regressions pertaining to unclear terrorism (3.43% pa for 174.9 yrs) while the highest rate of convergence is in upper-middle-income countries for domestic terrorism regressions (15.33% pa for 39.13 yrs). Whereas no fundamental characteristic consistently exhibits catch-up across terrorism dynamics, the following sub-samples are not consistently significant: English common law, Oil-rich, Oil-poor, Not-landlocked, Christian-dominated and African samples.

Table 1: Summary of results

Panel A: Difference GMM

Panel A1: Domestic Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Catch-up(C)	No	No	No	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No
Rate of C (%)	---	---	---	11.76	---	8.90	---	---	---	---	---	---	---	---	---	---	---
Time to FC (Yrs)	---	---	---	51.28	---	67.41	---	---	---	---	---	---	---	---	---	---	---

Panel A2: Transnational Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Catch-up(C)	No	No	No	Yes	No	No	Yes	No	No	No	No	No	No	No	No	No	No
Rate of C (%)	---	---	---	7.05	---	---	10.03	---	---	---	---	---	---	---	---	---	---
Time to FC (Yrs)	---	---	---	85.10	---	---	59.82	---	---	---	---	---	---	---	---	---	---

Panel A3: Unclear Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Catch-up(C)	No	Yes	No	Yes	No	No	No	No	No	No	No	No	No	na	Yes	No	No
Rate of C (%)	---	11.70	---	10.11	---	---	---	---	---	---	---	---	---	na	10.33	---	---
Time to FC (Yrs)	---	51.28	---	59.34	---	---	---	---	---	---	---	---	---	na	50.08	---	---

Panel A4: Total Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Catch-up(C)	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Rate of C (%)	---	---	9.15	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Time to FC (Yrs)	---	---	65.57	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Panel B: System GMM

Panel B1: Domestic Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Catch-up(C)	Yes	No	Yes	Yes	No	Yes	No	No	Yes	No	Yes	No	No	No	No	No	No
Rate of C (%)	8.75	---	7.78	15.33	---	13.23	---	---	11.90	---	14.10	---	---	---	---	---	---

Time to FC (Yrs)	68.57	---	77.12	39.13	---	45.35	---	---	50.42	---	42.55	---	---	---	---	---	---

Panel B2: Transnational Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Catch-up(C)	Yes	No	Yes	Yes	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	No
Rate of C (%)	5.98	---	10.91	8.31	---	7.66	---	---	---	---	7.30	---	---	---	---	6.85	---
Time to FC (Yrs)	100.3	---	54.99	72.20	---	78.32	---	---	---	---	82.19	---	---	---	---	87.59	---

Panel B3: Unclear Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Catch-up(C)	No	Yes	No	Yes	No	No	No	No	Yes	No	No	No	Yes	na	No	Yes	No
Rate of C (%)	---	11.93	---	11.73	---	---	---	---	3.43	---	---	---	8.65	na	---	9.70	---
Time to FC (Yrs)	---	50.29	---	51.15	---	---	---	---	174.9	---	---	---	69.36	na	---	61.85	---

Panel B4: Total Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Catch-up(C)	No	No	Yes	No	No	No	No	No	Yes	No	Yes	No	No	Yes	No	No	No
Rate of C (%)	---	---	9.50	---	---	---	---	---	9.35	---	12.23	---	---	14.85	---	---	---
Time to FC (Yrs)	---	---	63.15	---	---	---	---	---	64.17	---	49.05	---	---	40.40	---	---	---

Low: Low Income countries. Mid: Middle Income countries. LMid: Lower Middle Income countries. UMid: Upper Middle Income countries. English: English Common law countries. French: French Civil law countries. Oil: Petroleum Exporting countries. NOil: Non-petroleum Exporting countries. Closed: Landlocked countries. Open: Countries open to the sea. Conf: Conflict Affected countries. NConf: Countries not Affected by Conflicts. SSA: Sub-Saharan Africa. NA: North Africa. Chrit: Christian dominated countries. Islam: Muslim dominated countries. C: Catch-up. FC: Full Catch-up. Yrs: Years. na: not applicable because of issues in degrees of freedom.

Table 2: Absolute Beta Catch-Up

Panel A: Difference GMM

Panel A1: Domestic Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Initial	0.276	**0.752***	0.248	**0.706***	**0.637**	**0.534***	0.632	**0.618***	−0.161	**0.628***	0.628	**0.779***	**0.649***	0.389	**0.827***	−0.020	**0.714***
	(0.306)	**(0.000)**	(0.319)	**(0.000)**	**(0.011)**	**(0.000)**	(0.280)	**(0.000)**	(0.658)	**(0.000)**	(0.203)	**(0.000)**	**(0.002)**	(0.424)	**(0.000)**	(0.950)	**(0.000)**
Time. effects	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(2)	**(0.284)**	**(0.119)**	**(0.323)**	**(0.373)**	**(0.075)**	**(0.332)**	**(0.870)**	**(0.065)**	**(0.216)**	**(0.139)**	**(0.705)**	(0.072)	(0.071)	(0.405)	(0.073)	**(0.441)**	(0.065)
Sargan OIR	**(0.481)**	(0.009)	**(0.323)**	**(0.307)**	(0.055)	**(0.300)**	**(0.445)**	**(0.327)**	**(0.541)**	(0.047)	**(0.273)**	**(0.471)**	**(0.124)**	**(0.657)**	**(0.329)**	(0.021)	**(0.229)**
Wald (joint)	(0.306)	**(0.000)**	(0.319)	**(0.000)**	**(0.010)**	**(0.059)**	(0.280)	**(0.001)**	(0.658)	**(0.000)**	(0.203)	**(0.000)**	**(0.002)**	(0.424)	**(0.000)**	(0.950)	**(0.000)**
Wald (time)	**(0.045)**	**(0.013)**	**(0.046)**	na	(0.598)	**(0.038)**	**(0.015)**	**(0.016)**	(0.247)	**(0.038)**	**(0.006)**	**(0.000)**	**(0.010)**	(0.343)	**(0.018)**	(0.191)	**(0.004)**
Instruments	9	9	9	6	9	9	9	9	9	9	9	9	9	9	9	9	9
Countries	31	22	12	10	20	33	10	43	15	38	12	41	47	6	33	20	53
Observations	93	66	36	30	60	99	30	129	45	114	36	123	141	18	99	60	159

Panel A2: Transnational Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Initial	0.182	0.302	0.468	**0.423***	0.271	0.254	**0.602***	0.344	0.327	0.10.7	−0.139	**0.514***	0.186	−0.257	**0.571***	−0.164	0.250
	(0.552)	(0.325)	(0.199)	**(0.066)**	(0.661)	(0.132)	**(0.055)**	(0.141)	(0.473)	(0.743)	(0.750)	**(0.016)**	(0.535)	(0.846)	**(0.092)**	(0.682)	(0.383)
Time. effects	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(2)	**(0.231)**	**(0.855)**	**(0.364)**	**(0.306)**	**(0.496)**	**(0.227)**	**(0.771)**	**(0.269)**	**(0.184)**	**(0.585)**	**(0.543)**	**(0.128)**	**(0.351)**	**(0.052)**	**(0.744)**	**(0.799)**	**(0.327)**
Sargan OIR	**(0.376)**	(0.091)	**(0.361)**	**(0.843)**	**(0.190)**	**(0.207)**	**(0.192)**	**(0.150)**	(0.063)	(0.022)	**(0.112)**	(0.088)	(0.066)	**(0.666)**	(0.053)	**(0.235)**	(0.021)
Wald (joint)	(0.552)	(0.325)	(0.109)	**(0.066)**	(0.661)	(0.132)	**(0.055)**	(0.141)	(0.473)	(0.743)	(0.750)	**(0.016)**	(0.535)	(0.846)	**(0.029)**	(0.682)	(0.383)
Wald (time)	(0.109)	(0.526)	(0.429)	na	**(0.075)**	**(0.080)**	(0.245)	**(0.044)**	(0.167)	(0.451)	(0.435)	**(0.062)**	(0.118)	(0.223)	(0.214)	(0.126)	**(0.066)**
Instruments	9	9	9	6	9	9	9	9	9	9	9	9	9	9	9	9	9
Countries	31	22	12	10	20	33	10	43	15	38	12	41	47	6	33	20	53
Observations	93	66	36	30	60	99	30	129	45	114	36	123	141	18	99	60	159

Panel A3: Unclear Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Initial	0.201	**0.702***	0.226	**0.607***	**0.527***	**0.284***	0.309	**0.591***	0.242	**0.646***	0.107	**0.619***	**0.603***	na	**0.620***	0.134	0.623
	(0.339)	**(0.000)**	(0.203)	**(0.000)**	**(0.000)**	**(0.072)**	(0.673)	**(0.000)**	(0.238)	**(0.000)**	(0.426)	**(0.000)**	**(0.000)**		**(0.000)**	(0.362)	(0.000)
Time. effects	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	na	Yes	Yes	Yes
AR(2)	**(0.615)**	**(0.615)**	**(0.193)**	**(0.454)**	**(0.336)**	**(0.349)**	**(0.554)**	**(0.648)**	**(0.613)**	**(0.663)**	**(0.194)**	**(0.407)**	**(0.847)**	na	**(0.781)**	**(0.563)**	**(0.994)**
Sargan OIR	(0.075)	**(0.240)**	**(0.361)**	**(0.546)**	(0.025)	(0.081)	**(0.791)**	(0.071)	(0.061)	(0.094)	**(0.435)**	(0.041)	(0.095)	na	**(0.357)**	**(0.572)**	(0.037)
Wald (joint)	(0.339)	**(0.000)**	(0.203)	**(0.000)**	**(0.000)**	**(0.072)**	(0.673)	**(0.000)**	(0.238)	**(0.000)**	(0.426)	**(0.000)**	**(0.000)**	na	**(0.000)**	(0.362)	**(0.000)**
Wald (time)	(0.212)	(0.252)	(0.678)	na	(0.182)	(0.113)	(0.435)	(0.139)	**(0.027)**	(0.558)	(0.447)	(0.432)	(0.206)	na	(0.144)	**(0.011)**	(0.187)

Instruments	9	9	9	6	13	9	9	9	9	9	9	9	9	na	9	9	9
Countries	31	22	12	10	20	33	10	43	15	38	12	41	47	na	33	20	53
Observations	93	66	36	30	80	99	30	129	45	114	36	123	141	na	99	60	159

Panel A4: Total Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Initial	0.224	**0.660**	**0.549**	**1.059**	0.603	0.440	0.288	**0.630**	0.128	**0.494**	0.245	**0.805**	**0.589**	−0.142	**0.898***	−0.235	**0.662**
		***	*	***				**		*		***	*		**		***
	(0.539)	**(0.000)**	**(0.067)**	**(0.000)**	(0.106)	(0.108)	(0.670)	**(0.012)**	(0.791)	**(0.077)**	(0.699)	**(0.000)**	**(0.080)**	(0.246)	**(0.000)**	(0.719)	**(0.000)**
Time. effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
AR(2)	(0.071)	**(0.272)**	**(0.841)**	**(0.127)**	**(0.137)**	**(0.150)**	**(0.142)**	(0.021)	**(0.201)**	**(0.166)**	**(0.644)**	(0.010)	(0.059)	**(0.221)**	(0.078)	**(0.452)**	(0.038)
Sargan OIR	**(0.138)**	(0.032)	**(0.130)**	**(0.358)**	(0.048)	**(0.148)**	**(0.192)**	(0.062)	(0.093)	(0.029)	**(0.114)**	(0.061)	**(0.132)**	**(0.331)**	**(0.215)**	(0.036)	(0.051)
Wald (joint)	(0.539)	**(0.000)**	**(0.067)**	**(0.000)**	(0.106)	(0.108)	(0.670)	**(0.012)**	(0.791)	**(0.077)**	(0.699)	**(0.000)**	**(0.080)**	(0.246)	**(0.000)**	(0.719)	**(0.023)**
Wald (time)	(0.118)	(0.244)	(0.214)	**(0.097)**	(0.516)	**(0.092)**	(0.475)	**(0.027)**	**(0.006)**	(0.110)	(0.283)	**(0.019)**	**(0.033)**	na	**(0.010)**	**(0.094)**	**(0.014)**
Instruments	9	9	9	13	9	9	9	9	9	9	9	9	9	6	13	9	9
Countries	31	22	12	10	20	33	10	43	15	38	12	41	47	6	33	20	53
Observations	93	66	36	40	60	99	30	129	45	114	36	123	141	18	99	60	159

Panel B: System GMM

Panel B1: Domestic Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Initial	**0.525**	**0.764**	**0.467**	**0.920**	**0.776**	**0.794**	0.281	**0.679**	**0.714**	**0.794**	**0.846**	**0.859**	**0.717**	1.102	**0.819***	**0.858*****	**0.849**
	***	***	***	***	***	***		***	***	***	***	***	***		**		***
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.709)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.305)	**(0.000)**	**(0.000)**	**(0.000)**
Time. effects	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(2)	**(0.280)**	(0.097)	**(0.298)**	**(0.334)**	**(0.055)**	**(0.303)**	**(0.997)**	**(0.068)**	**(0.407)**	**(0.120)**	**(0.586)**	(0.074)	(0.073)	**(0.287)**	(0.095)	**(0.256)**	(0.061)
Sargan OIR	**(0.596)**	(0.036)	**(0.400)**	**(0.727)**	**(0.105)**	**(0.283)**	**(0.806)**	**(0.330)**	**(0.324)**	(0.007)	**(0.358)**	(0.011)	(0.059)	**(0.937)**	(0.097)	(0.072)	(0.087)
Wald (joint)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.709)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.305)	**(0.000)**	**(0.000)**	**(0.000)**
Wald (time)	**(0.000)**	**(0.000)**	**(0.020)**	na	(0.125)	**(0.011)**	**(0.027)**	**(0.007)**	**(0.001)**	**(0.001)**	**(0.000)**	**(0.027)**	**(0.006)**	(0.124)	**(0.063)**	**(0.004)**	**(0.026)**
Instruments	13	13	13	9	13	13	13	13	13	13	13	13	13	13	13	13	13
Countries	31	22	12	10	20	33	10	43	15	38	12	41	47	6	33	20	53
Observations	124	88	48	40	80	132	40	172	60	152	48	164	188	24	132	80	212

Panel B2: Transnational Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Initial	**0.359**	**0.561**	**0.655**	**0.499**	**0.495**	**0.460****	0.418	**0.430**	**0.503**	**0.504**	**0.438**	**0.516**	**0.442**	−1.147	**0.590***	**0.411*****	**0.493**
	***	***	***	***	***	*		***	*	***	*	***	***		**		***
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.414)	**(0.000)**	**(0.052)**	**(0.000)**	**(0.056)**	**(0.000)**	**(0.000)**	(0.188)	**(0.000)**	**(0.000)**	**(0.000)**
Time. effects	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(2)	**(0.260)**	**(0.841)**	**(0.421)**	**(0.300)**	**(0.410)**	**(0.211)**	**(0.767)**	**(0.280)**	(0.099)	**(0.386)**	**(0.472)**	**(0.153)**	**(0.348)**	**(0.498)**	**(0.799)**	**(0.357)**	**(0.286)**
Sargan OIR	**(0.169)**	(0.019)	**(0.251)**	**(0.980)**	(0.025)	**(0.287)**	**(0.475)**	(0.088)	(0.096)	(0.017)	**(0.187)**	(0.031)	(0.031)	**(1.000)**	(0.091)	**(0.318)**	(0.013)
Wald (joint)	**(0.000)**	**(0.000)**	(0.251)	**(0.000)**	**(0.000)**	**(0.000)**	(0.414)	**(0.000)**	**(0.052)**	**(0.000)**	**(0.056)**	**(0.000)**	**(0.000)**	(0.188)	**(0.000)**	**(0.000)**	**(0.000)**

Wald (time)	**(0.032)**	(0.494)	**(0.000)**	na	**(0.008)**	**(0.006)**	(0.101)	**(0.005)**	**(0.000)**	**(0.044)**	**(0.043)**	**(0.049)**	**(0.035)**	**(0.000)**	(0.120)	**(0.000)**	**(0.036)**
Instruments	13	13	13	9	13	13	13	13	13	13	13	13	13	13	13	13	13
Countries	31	22	12	10	20	33	10	43	15	38	12	41	47	6	33	20	53
Observations	124	88	48	40	80	132	40	172	60	152	48	164	188	24	132	80	212

Panel B3: Unclear Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Initial	**0.271** ***	**0.716** ***	0.196	**0.704** ***	**0.527** ***	**0.385** ***	−0.790	**0.563** ***	**0.206** **	**0.640** ***	0.118	**0.685** ***	**0.519** ***	na	**0.536*** **	**0.582*****	**0.653** ***
	(0.000)	**(0.000)**	(0.494)	**(0.000)**	**(0.000)**	**(0.000)**	(0.114)	**(0.000)**	**(0.034)**	**(0.000)**	(0.330)	**(0.000)**	**(0.000)**		**(0.000)**	**(0.000)**	**(0.000)**
Time. effects	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	na	Yes	No	Yes
AR(2)	**(0.447)**	**(0.639)**	**(0.203)**	**(0.439)**	**(0.336)**	**(0.171)**	(0.000)	**(0.685)**	**(0.652)**	**(0.689)**	**(0.164)**	**(0.403)**	**(0.963)**		**(0.810)**	**(0.390)**	**(0.964)**
Sargan OIR	(0.077)	**(0.414)**	**(0.855)**	**(0.976)**	(0.025)	(0.003)	**(1.000)**	(0.025)	**(0.149)**	(0.012)	**(0.347)**	(0.002)	**(0.218)**	na	**(0.428)**	**(0.361)**	(0.053)
Wald (joint)	**(0.001)**	**(0.000)**	(0.494)	**(0.000)**	**(0.000)**	**(0.005)**	(0.114)	**(0.000)**	**(0.034)**	**(0.000)**	(0.330)	**(0.000)**	**(0.000)**	na	**(0.000)**	**(0.000)**	**(0.000)**
Wald (time)	**(0.001)**	na	**(0.000)**	na	(0.182)	**(0.021)**	**(0.070)**	**(0.089)**	**(0.000)**	(0.359)	**(0.001)**	(0.656)	**(0.012)**	na	(0.193)	na	(0.142)
Instruments	13	9	13	9	13	13	13	13	13	13	13	13	13	na	13	9	13
Countries	31	22	12	10	20	33	10	43	15	38	12	41	47	na	33	20	53
Observations	124	88	48	40	80	132	40	172	60	152	48	164	188	na	132	80	212

Panel B4: Total Terrorism

	Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		Africa
	Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
Initial	**0.534** ***	**0.929** ***	**0.570** ***	**1.059** ***	**0.794** ***	**0.843** ***	0.643	**0.792** ***	**0.561** ***	**0.798** ***	**0.734** ***	**0.961** ***	**0.683** ***	**0.891** ***	**0.930*** **	**0.784*****	**0.821** ***
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.142)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Time. effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
AR(2)	(0.078)	(0.049)	**(0.805)**	**(0.127)**	**(0.100)**	(0.080)	**(0.314)**	(0.017)	**(0.148)**	(0.082)	**(0.459)**	(0.009)	(0.051)	**(0.252)**	(0.093)	(0.096)	(0.027)
Sargan OIR	**(0.127)**	(0.020)	**(0.283)**	**(0.358)**	(0.066)	**(0.135)**	**(0.630)**	(0.061)	**(0.210)**	(0.008)	**(0.251)**	(0.017)	**(0.130)**	**(0.797)**	(0.087)	**(0.235)**	(0.055)
Wald (joint)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.142)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.001)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Wald (time)	**(0.000)**	**(0.003)**	**(0.000)**	**(0.097)**	(0.447)	**(0.010)**	**(0.007)**	**(0.003)**	**(0.004)**	**(0.060)**	**(0.019)**	(0.135)	**(0.000)**	na	**(0.075)**	**(0.023)**	**(0.011)**
Instruments	13	13	13	13	13	13	13	13	13	13	13	13	13	9	13	13	13
Countries	31	22	12	10	20	33	10	43	15	38	12	41	47	6	33	20	53
Observations	124	88	48	40	80	132	40	172	60	152	48	164	188	24	132	80	212

*,**,**: significance levels of 10%, 5% and 1% respectively. Initial: Lagged dependent variable. AR(2): Second-order Autocorrelation test. Sargan: Sargan Overidentifying Restrictions (OIR) test. T.effects: Time effects. W (joint): Wald test for joint significance of estimated coefficients. W(time): Wald test for joint significance of time effects. Instr: number of instruments. C'tries: number of countries. Obs: number of observations. The significance of bold values is twofold. 1) The significance of estimated coefficients and the Wald statistics. 2) The failure to reject the null hypotheses of: a) no autocorrelation in the AR(2) tests and; b) the validity of the instruments in the Sargan OIR test. P-values in brackets. Low: Low Income countries. Mid: Middle Income countries. LMid: Lower Middle Income countries. UMid: Upper Middle Income countries. English: English Common law countries. French: French Civil law countries. Oil: Petroleum Exporting countries. NOil: Non-petroleum Exporting countries. Closed: Landlocked countries. Open: Countries open to the sea. Conf: Conflict Affected countries. NConf: Countries not Affected by Conflicts. SSA: Sub-Saharan Africa. NA: North Africa. Chrit: Christian dominated countries. Islam: Muslim dominated countries. na: not applicable because of issues in degrees of freedom. Highlights in blue imply that time effects are not exceptionally used because of issues in degrees of freedom.

Consistent with the conceptual clarifications in the preceding sections, some important caveats are note worthy. Accordingly, employing econometrics beyond the empirical exercise of either accepting or refuting the validity of existing theories has some shortcomings. Fortunately, there is an evolving stream of literature supporting the empirical relevance of extending the theoretical underpinnings of income catch-up to other development fields. Within the framework of absolute beta convergence, corresponding literature (see Miller & Upadhyay, 2002; Apergis et al., 2010) is accords with the view that differences in initial conditions could lead to divergence or absence of absolute beta convergence. Hence, cases with lack of convergence could be traceable to cross-country disparities in initial levels of terrorism within sub-samples. Conversely, the presence of convergence is an indication that even beyond the constraint of differences in initial conditions between countries within a fundamental characteristic; the common fundamental features on which the sub-sampling is based are relevant in enabling nations with lower levels of terrorism to catch-up their counterparts with higher levels.

Given the apparent shortcomings in the absolute beta convergence approach, we are consistent with Asongu (2014b) in complementing the beta technique with the sigma convergence methodology. In essence, the absolute beta catch-up is a necessary but not a sufficient condition for sigma convergence.

4.2 Sigma convergence

This section presents tabular and graphical findings of sigma convergence computations. Values in Table 3 correspond to yearly standard deviations in domestic (Panel A), transnational (Panel B), unclear (Panel C) and total (Panel D) terrorism dynamics. The criterion for assessing sigma convergence is from evidence of decreasing standard deviations in terrorism dynamics across years. The standard deviations or dispersions are computed with the help of Eq. (4). Given the difficulty of observing changes in these dispersions across time for each fundamental characteristic in corresponding terrorism dynamics, the study complements the tabular representations with graphical presentations.

Table 3: Tabular representations of Sigma convergence in terrorism dynamics

Panel A: Domestic terrorism

Year	LMI	MI	UMI	LI	Eng.	Frch.	Chr.	Islam	LL	NLL	Oil	NOil	Con	NCon	SSA	NA	Africa
1983	0.775	0.971	1.211	0.487	1.073	0.266	0.877	0.339	0.823	0.693	0.585	0.765	0.690	0.740	0.768	0.000	0.729
1984	0.508	0.909	1.260	0.602	0.945	0.588	0.850	0.526	0.608	0.792	0.718	0.745	0.693	0.740	0.762	0.580	0.739
1985	0.200	0.954	1.409	0.402	1.015	0.352	0.848	0.000	0.324	0.780	0.219	0.748	0.270	0.762	0.720	0.000	0.680
1986	0.538	1.095	1.549	0.330	1.135	0.350	0.904	0.384	0.244	0.872	0.589	0.785	0.549	0.803	0.793	0.000	0.750
1987	0.698	1.108	1.503	0.511	1.133	0.529	0.937	0.550	0.566	0.896	0.219	0.889	0.615	0.866	0.798	0.924	0.811
1988	0.951	1.306	1.695	0.632	1.292	0.704	1.128	0.657	0.609	1.084	0.895	0.998	0.821	1.017	0.999	0.788	0.971
1989	0.862	1.174	1.516	0.867	1.227	0.785	1.180	0.535	0.836	1.069	0.841	1.043	0.770	1.068	1.035	0.731	1.001
1990	1.651	1.544	1.477	0.745	1.178	1.151	1.325	0.807	0.731	1.286	1.653	1.026	1.562	1.019	1.181	0.963	1.151
1991	0.897	1.198	1.526	0.816	1.086	0.938	1.039	0.890	0.664	1.094	0.980	0.992	0.707	1.058	0.961	1.226	0.989
1992	1.385	1.693	2.072	1.047	1.288	1.389	1.269	1.483	0.866	1.478	1.600	1.284	0.858	1.463	1.156	2.470	1.342
1993	0.921	0.891	0.900	0.124	0.515	0.651	0.428	0.813	0.179	0.696	0.630	0.598	0.200	0.672	0.360	1.379	0.599
1994	1.329	1.599	1.947	0.861	1.144	1.266	1.027	1.460	0.926	1.310	1.464	1.148	0.786	1.303	0.961	2.446	1.211
1995	1.259	1.433	1.689	0.755	0.732	1.278	0.875	1.391	0.984	1.151	1.516	0.982	0.955	1.126	0.775	2.356	1.099
1996	1.160	1.322	1.554	0.820	0.948	1.121	0.860	1.323	1.047	1.063	1.333	0.966	0.833	1.097	0.827	1.914	1.049
1997	0.732	0.714	0.728	0.786	0.821	0.705	0.831	0.612	1.041	0.606	0.219	0.820	0.508	0.812	0.790	0.000	0.750
1998	0.734	1.069	1.410	0.688	0.764	0.930	0.744	1.052	0.860	0.874	1.507	0.638	0.857	0.870	0.679	1.760	0.864
1999	0.633	0.957	1.283	0.628	0.725	0.817	0.698	0.910	0.796	0.780	1.224	0.611	0.807	0.765	0.652	1.514	0.781
2000	0.687	1.044	1.383	0.588	0.781	0.826	0.743	0.913	0.764	0.831	1.345	0.613	0.797	0.807	0.664	1.605	0.806
2001	1.039	1.104	1.231	0.671	0.601	1.008	0.818	0.977	0.904	0.874	1.491	0.627	1.165	0.739	0.758	1.589	0.874
2002	0.400	0.814	0.421	0.685	0.667	0.783	0.679	0.836	0.839	0.688	1.123	0.607	0.776	0.718	0.611	1.440	0.734
2003	0.317	0.649	0.914	0.554	0.662	0.549	0.538	0.679	0.757	0.506	0.934	0.468	0.447	0.628	0.477	1.180	0.589
2004	0.431	0.552	0.695	0.444	0.532	0.466	0.421	0.584	0.559	0.463	0.775	0.382	0.502	0.486	0.411	0.885	0.487
2005	0.317	0.467	0.615	0.643	0.564	0.604	0.519	0.673	0.690	0.542	0.672	0.570	0.545	0.601	0.560	0.788	0.584
2006	0.907	0.891	0.856	0.649	0.779	0.755	0.592	0.950	0.755	0.764	1.175	0.596	0.906	0.605	0.703	1.137	0.757
2007	0.863	0.849	0.868	0.970	1.214	0.678	0.590	1.220	0.515	1.029	1.167	0.831	1.397	0.590	0.907	1.022	0.913
2008	1.037	0.952	0.856	0.737	1.105	0.589	0.420	1.187	0.505	0.928	1.284	0.674	1.275	0.534	0.793	1.107	0.826
2009	0.799	0.882	1.005	0.936	1.052	0.820	0.628	1.175	0.477	1.029	1.202	0.813	1.429	0.558	0.862	1.271	0.905
2010	1.061	0.973	0.877	1.034	1.201	0.878	0.816	1.263	0.970	1.025	1.282	0.928	1.490	0.608	1.000	1.110	1.001
2011	1.467	1.169	0.390	1.085	1.605	0.653	0.728	1.511	0.654	1.242	1.574	0.965	1.813	0.580	1.162	0.542	1.111
2012	1.998	1.742	1.427	1.276	1.957	1.133	0.948	1.979	0.818	1.667	2.253	1.216	2.072	1.155	1.417	1.785	1.486

Panel B: Transnational terrorism

Year	LMI	MI	UMI	LI	Eng.	Frch.	Chr.	Islam	LL	NLL	Oil	NOil	Con	NCon	SSA	NA	Africa
1983	0.431	0.424	0.438	0.296	0.455	0.266	0.377	0.310	0.354	0.355	0.438	0.335	0.431	0.331	0.372	0.000	0.352
1984	0.625	0.642	0.695	0.208	0.577	0.348	0.495	0.363	0.179	0.512	0.676	0.362	0.629	0.357	0.471	0.000	0.446
1985	0.545	0.494	0.438	0.230	0.385	0.365	0.351	0.404	0.324	0.389	0.390	0.368	0.359	0.376	0.310	0.648	0.369
1986	0.543	0.506	0.438	0.278	0.431	0.377	0.363	0.453	0.376	0.408	0.219	0.425	0.313	0.420	0.322	0.663	0.396
1987	0.270	0.243	0.219	0.539	0.283	0.513	0.537	0.155	0.662	0.315	0.219	0.476	0.359	0.463	0.457	0.283	0.439
1988	0.547	0.501	0.438	0.402	0.573	0.321	0.447	0.453	0.547	0.399	0.528	0.430	0.487	0.438	0.450	0.449	0.445
1989	0.545	0.521	0.509	0.464	0.544	0.450	0.533	0.404	0.411	0.516	0.528	0.480	0.487	0.490	0.494	0.449	0.485
1990	0.550	0.522	0.509	0.631	0.674	0.514	0.655	0.439	0.607	0.584	0.584	0.591	0.775	0.489	0.612	0.283	0.585
1991	0.629	0.665	0.737	0.586	0.519	0.663	0.537	0.730	0.510	0.657	0.872	0.551	0.737	0.541	0.557	0.996	0.614
1992	0.932	0.894	0.815	0.757	0.816	0.816	0.766	0.884	0.705	0.849	1.153	0.682	1.078	0.651	0.797	0.948	0.810
1993	0.753	0.726	0.728	0.421	0.453	0.627	0.230	0.830	0.324	0.632	0.737	0.524	0.550	0.573	0.360	1.201	0.563
1994	0.705	0.983	1.278	0.903	1.002	0.896	0.716	1.191	0.791	0.987	1.206	0.862	1.100	0.886	0.808	1.530	0.929
1995	0.513	0.713	0.924	0.802	0.724	0.792	0.689	0.878	0.834	0.739	0.900	0.733	1.020	0.599	0.719	1.097	0.760
1996	0.629	0.665	0.737	0.661	0.727	0.621	0.543	0.811	0.500	0.708	0.848	0.605	0.918	0.526	0.604	0.882	0.656
1997	0.458	0.588	0.742	0.668	0.569	0.675	0.594	0.702	0.698	0.613	0.735	0.604	0.725	0.580	0.595	0.919	0.632
1998	0.582	0.521	0.468	0.347	0.419	0.436	0.445	0.404	0.458	0.418	0.695	0.298	0.590	0.365	0.412	0.566	0.426
1999	0.691	0.532	0.219	0.398	0.526	0.392	0.454	0.462	0.354	0.491	0.749	0.356	0.771	0.263	0.477	0.000	0.453
2000	0.359	0.346	0.347	0.457	0.572	0.223	0.351	0.493	0.441	0.406	0.390	0.421	0.616	0.290	0.433	0.000	0.412
2001	0.388	0.300	0.000	0.372	0.404	0.305	0.388	0.254	0.459	0.288	0.415	0.323	0.413	0.304	0.359	0.000	0.342
2002	0.000	0.234	0.372	0.330	0.283	0.305	0.305	0.283	0.284	0.302	0.390	0.271	0.458	0.201	0.274	0.449	0.295
2003	0.663	0.513	0.219	0.315	0.487	0.348	0.306	0.535	0.358	0.426	0.531	0.376	0.505	0.374	0.343	0.730	0.406
2004	0.317	0.234	0.000	0.124	0.000	0.223	0.121	0.246	0.000	0.208	0.000	0.196	0.200	0.172	0.101	0.449	0.177
2005	0.447	0.346	0.000	0.208	0.313	0.249	0.202	0.361	0.244	0.286	0.390	0.240	0.388	0.225	0.247	0.449	0.273
2006	1.110	0.881	0.347	0.425	0.801	0.567	0.493	0.836	0.358	0.740	0.981	0.505	1.114	0.225	0.682	0.480	0.659
2007	1.038	0.840	0.509	0.616	0.968	0.510	0.266	1.020	0.578	0.765	1.150	0.518	1.179	0.416	0.717	0.718	0.712
2008	0.720	0.566	0.292	0.605	0.843	0.341	0.289	0.822	0.398	0.647	0.744	0.527	0.970	0.292	0.607	0.380	0.584
2009	0.808	0.680	0.509	0.653	0.856	0.517	0.249	0.924	0.477	0.724	0.945	0.543	1.019	0.405	0.638	0.831	0.659
2010	0.839	0.679	0.219	0.443	0.742	0.403	0.417	0.726	0.424	0.600	0.875	0.394	0.837	0.292	0.577	0.283	0.552
2011	0.840	0.712	0.531	0.594	0.870	0.466	0.302	0.881	0.354	0.726	0.954	0.523	1.096	0.363	0.642	0.594	0.643
2012	1.029	0.942	0.835	0.669	0.984	0.660	0.377	1.116	0.470	0.886	1.236	0.630	1.171	0.561	0.730	1.175	0.789

Panel C : Unclear terrorism

Year	LMI	MI	UMI	LI	Eng.	Frch.	Chr.	Islam	LL	NLL	Oil	NOil	Con	NCon	SSA	NA	Africa
1983	0.634	0.611	0.615	0.000	0.435	0.382	0.503	0.000	0.000	0.470	0.695	0.297	0.634	0.304	0.423	0.000	0.399
1984	0.400	0.515	0.634	0.230	0.462	0.321	0.467	0.000	0.179	0.430	0.438	0.367	0.400	0.376	0.399	0.000	0.377
1985	0.317	0.613	0.856	0.256	0.649	0.223	0.545	0.000	0.324	0.479	0.347	0.460	0.317	0.470	0.463	0.000	0.438
1986	0.388	0.651	0.896	0.197	0.644	0.287	0.550	0.213	0.000	0.528	0.390	0.468	0.359	0.479	0.471	0.283	0.452
1987	0.200	0.564	0.791	0.256	0.616	0.168	0.495	0.213	0.324	0.446	0.219	0.446	0.359	0.431	0.436	0.000	0.412
1988	0.200	0.579	0.815	0.361	0.632	0.302	0.564	0.155	0.354	0.502	0.000	0.507	0.000	0.518	0.482	0.283	0.462
1989	0.000	0.628	0.931	0.528	0.808	0.312	0.702	0.000	0.605	0.552	0.000	0.624	0.317	0.622	0.599	0.000	0.566
1990	0.562	0.844	1.112	0.444	0.838	0.473	0.777	0.213	0.411	0.709	0.630	0.644	0.579	0.658	0.668	0.283	0.635
1991	0.270	0.808	1.170	0.315	0.845	0.306	0.698	0.254	0.287	0.653	0.219	0.625	0.270	0.635	0.604	0.000	0.571
1992	0.000	1.055	1.542	0.278	1.093	0.305	0.865	0.313	0.317	0.814	0.347	0.768	0.000	0.796	0.736	0.449	0.706
1993	0.400	0.296	0.000	0.000	0.000	0.241	0.000	0.310	0.000	0.225	0.000	0.211	0.000	0.217	0.000	0.566	0.190
1994	0.400	1.121	1.580	0.575	0.983	0.742	0.817	0.883	0.661	0.903	1.054	0.791	0.694	0.880	0.751	1.365	0.836

1995	0.502	0.811	1.090	0.695	0.643	0.791	0.759	0.720	0.911	0.660	0.924	0.700	0.815	0.722	0.668	1.182	0.737
1996	0.447	1.022	1.441	0.671	0.892	0.801	0.859	0.796	0.889	0.814	1.083	0.769	0.851	0.825	0.741	1.371	0.828
1997	0.804	1.135	1.483	0.559	0.596	0.979	0.641	1.120	0.734	0.899	1.409	0.651	0.662	0.898	0.656	1.832	0.849
1998	0.000	0.148	0.219	0.124	0.155	0.121	0.121	0.155	0.000	0.157	0.219	0.106	0.000	0.151	0.101	0.283	0.133
1999	0.400	0.296	0.000	0.124	0.000	0.266	0.266	0.000	0.000	0.249	0.438	0.106	0.431	0.000	0.224	0.000	0.211
2000	0.200	0.204	0.219	0.230	0.283	0.168	0.223	0.213	0.324	0.157	0.292	0.196	0.270	0.201	0.210	0.283	0.217
2001	0.200	0.271	0.347	0.124	0.213	0.191	0.121	0.283	0.000	0.233	0.390	0.106	0.200	0.201	0.141	0.449	0.199
2002	0.270	0.347	0.690	0.124	0.155	0.288	0.168	0.339	0.179	0.269	0.468	0.148	0.270	0.240	0.171	0.566	0.246
2003	0.200	0.204	0.219	0.249	0.339	0.121	0.241	0.213	0.358	0.157	0.292	0.211	0.200	0.240	0.224	0.283	0.229
2004	0.000	0.000	0.000	0.124	0.000	0.121	0.000	0.155	0.000	0.112	0.000	0.106	0.000	0.108	0.101	0.000	0.095
2005	0.200	0.148	0.000	0.124	0.213	0.000	0.121	0.155	0.179	0.112	0.219	0.106	0.200	0.108	0.141	0.000	0.133
2006	0.447	0.365	0.219	0.000	0.338	0.168	0.000	0.379	0.000	0.286	0.478	0.106	0.428	0.151	0.224	0.358	0.245
2007	0.465	0.343	0.000	0.173	0.360	0.168	0.000	0.404	0.244	0.261	0.509	0.148	0.465	0.151	0.270	0.000	0.255
2008	0.538	0.423	0.219	0.173	0.454	0.121	0.168	0.441	0.179	0.342	0.589	0.148	0.549	0.151	0.309	0.283	0.304
2009	0.000	0.000	0.000	0.208	0.155	0.168	0.121	0.213	0.179	0.157	0.000	0.179	0.270	0.108	0.171	0.000	0.162
2010	0.000	0.148	0.219	0.197	0.246	0.121	0.000	0.283	0.000	0.208	0.219	0.168	0.317	0.108	0.160	0.283	0.177
2011	0.505	0.387	0.000	0.249	0.476	0.121	0.000	0.487	0.000	0.366	0.531	0.234	0.592	0.108	0.320	0.283	0.314
2012	0.940	0.754	0.438	0.448	0.835	0.366	0.320	0.846	0.179	0.681	1.016	0.431	0.961	0.386	0.601	0.566	0.592

Panel D : Total terrorism

Year	LMI	MI	UMI	LI	Eng.	Frch.	Chr.	Islam	LL	NLL	Oil	NOil	Con	NCon	SSA	NA	Africa
1983	0.980	1.098	1.267	0.565	1.122	0.517	0.988	0.443	0.868	0.824	0.898	0.822	0.909	0.798	0.874	0.000	0.832
1984	0.835	1.074	1.344	0.661	1.047	0.716	0.970	0.638	0.630	0.937	0.998	0.816	0.925	0.811	0.888	0.580	0.855
1985	0.662	1.074	1.466	0.521	1.102	0.542	0.952	0.404	0.544	0.879	0.584	0.840	0.550	0.858	0.815	0.648	0.794
1986	0.766	1.183	1.591	0.459	1.183	0.573	0.977	0.615	0.398	0.980	0.749	0.882	0.686	0.900	0.868	0.720	0.852
1987	0.745	1.131	1.513	0.738	1.170	0.727	1.066	0.589	0.851	0.952	0.390	0.997	0.759	0.967	0.919	0.964	0.917
1988	1.001	1.333	1.707	0.774	1.345	0.787	1.195	0.770	0.818	1.136	0.974	1.075	0.873	1.102	1.071	0.926	1.048
1989	0.992	1.252	1.565	0.986	1.341	0.857	1.279	0.652	0.987	1.144	0.967	1.134	0.916	1.154	1.130	0.849	1.097
1990	1.649	1.582	1.571	0.961	1.314	1.217	1.438	0.875	0.945	1.363	1.662	1.158	1.621	1.126	1.286	1.010	1.250
1991	0.809	1.267	1.689	0.947	1.174	1.047	1.142	0.966	0.781	1.193	1.153	1.082	0.684	1.154	1.067	1.244	1.087
1992	1.462	1.808	2.214	1.159	1.486	1.452	1.425	1.515	1.024	1.576	1.673	1.398	1.119	1.535	1.322	2.341	1.451
1993	1.071	1.048	1.076	0.429	0.651	0.819	0.477	1.045	0.354	0.859	0.906	0.725	0.590	0.802	0.496	1.620	0.754
1994	1.278	1.696	2.155	1.087	1.433	1.333	1.188	1.586	1.151	1.443	1.543	1.323	1.022	1.422	1.163	2.463	1.358
1995	1.271	1.501	1.806	1.006	0.996	1.355	1.069	1.453	1.165	1.261	1.572	1.147	1.219	1.198	1.001	2.340	1.225
1996	1.256	1.491	1.803	1.011	1.243	1.226	1.108	1.409	1.232	1.233	1.432	1.159	1.086	1.219	1.061	1.915	1.221
1997	1.003	1.287	1.623	1.032	1.044	1.201	1.049	1.285	1.242	1.104	1.442	1.057	0.992	1.163	1.040	1.831	1.134
1998	0.836	1.121	1.440	0.734	0.814	0.976	0.820	1.064	0.919	0.918	1.527	0.682	0.907	0.908	0.748	1.779	0.911
1999	0.899	1.072	1.300	0.716	0.857	0.890	0.813	0.989	0.858	0.893	1.364	0.688	0.978	0.801	0.782	1.514	0.876
2000	0.767	1.082	1.412	0.751	0.941	0.863	0.818	1.012	0.893	0.911	1.347	0.743	0.954	0.852	0.790	1.613	0.899
2001	1.078	1.134	1.243	0.753	0.712	1.040	0.877	1.017	0.984	0.913	1.463	0.701	1.184	0.792	0.823	1.605	0.924
2002	0.451	0.843	0.383	0.739	0.702	0.831	0.732	0.866	0.886	0.738	1.147	0.656	0.775	0.745	0.659	1.496	0.778
2003	0.756	0.827	0.947	0.616	0.817	0.635	0.600	0.863	0.830	0.657	1.078	0.583	0.651	0.720	0.583	1.293	0.704
2004	0.502	0.582	0.695	0.476	0.532	0.517	0.444	0.612	0.559	0.509	0.775	0.436	0.550	0.513	0.435	0.879	0.518
2005	0.590	0.589	0.615	0.675	0.671	0.631	0.566	0.725	0.755	0.598	0.783	0.611	0.649	0.641	0.619	0.793	0.640
2006	1.330	1.194	0.914	0.750	1.050	0.920	0.741	1.214	0.814	1.023	1.426	0.763	1.269	0.649	0.928	1.258	0.961
2007	1.216	1.089	0.941	1.058	1.389	0.817	0.633	1.428	0.778	1.162	1.502	0.908	1.566	0.714	1.057	1.152	1.060
2008	1.175	1.054	0.898	0.850	1.246	0.666	0.536	1.274	0.615	1.034	1.383	0.774	1.407	0.597	0.918	1.047	0.931
2009	1.029	1.026	1.054	1.037	1.211	0.912	0.662	1.300	0.661	1.143	1.359	0.903	1.530	0.662	0.984	1.333	1.024
2010	1.230	1.113	0.914	1.070	1.314	0.927	0.882	1.355	0.995	1.120	1.397	0.969	1.510	0.671	1.080	1.157	1.078
2011	1.534	1.267	0.672	1.113	1.671	0.737	0.760	1.545	0.658	1.320	1.680	1.000	1.898	0.659	1.209	0.572	1.170
2012	2.049	1.812	1.514	1.325	2.008	1.208	1.007	2.023	0.904	1.725	2.337	1.271	2.126	1.212	1.471	1.889	1.542

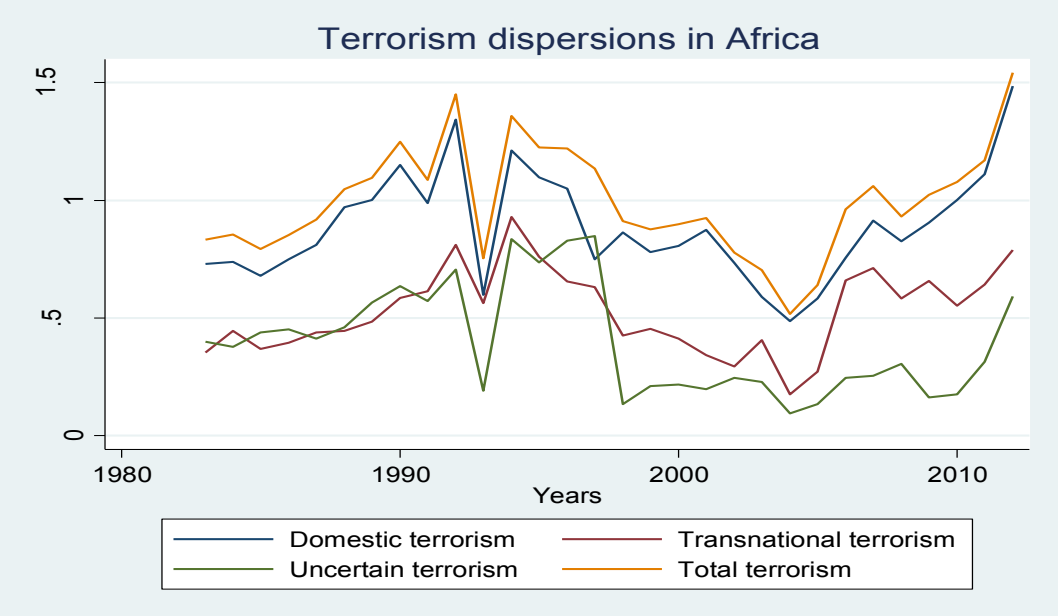
LMI.: Low Middle Income countries. MI: Middle Income countries. UMI.: Upper Middle Income countries. LI: Low Income countries. Eng: English Common law countries. Frch: French Civil law countries. Chr.: Christian dominated countries. Islam: Muslim dominated countries. Oil: petroleum exporting countries. NOil: Non-petroleum exporting countries. LL: Landlocked countries. NLL: Not Landlocked countries. Con: Conflict affected countries. NCon: Non conflict affected countries. SSA: Sub-Saharan Africa. NA: North Africa.

Figure 1 below shows terrorism dispersions for the full African sample. The y-axis denotes cross-country differences in terrorism dynamics whereas the x-axis shows the period in terms of years. We first notice that dispersions in domestic and total terrorism are comparatively higher than those of transnational and unclear terrorism. Second, overall dispersions in terrorism dynamics broadly display almost a similar tendency throughout the sampled periodicity, notably: increasing differences in terrorism occurrences up to the early 1990s when there is sharp fall, followed by sharp rise and a drop before a final phase of growth in the dispersions. The highest dispersions of each terrorism variable are apparent in 2012. These increasing dispersions from 2004 are consistent with the broad absence of absolute beta catch-up in Tables 1-2.

It is important to note that no significant evidence of beta catch-up was apparent in all terrorism variables. Hence, whereas the beta approach provides insights into the absence of reductions in cross-country differences in terrorism variables, the sigma approach informs the study about what periods are responsible for this absence of convergence. In essence from Figure 1, the absence of convergence in traceable to two main phases, namely: 1983-1991 and 2004- 2012.

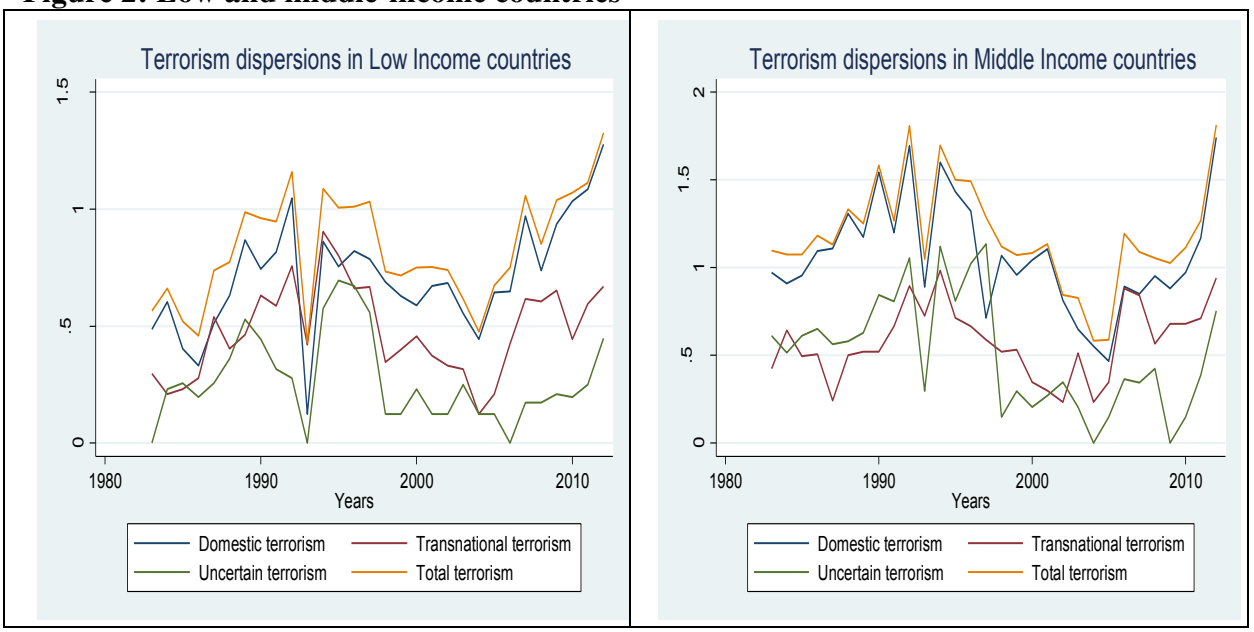
From the perspective of principal phases of increasing dispersions, the discourse in Figure 1 can be broadly extended to low- and middle-income (Figure 2), lower-middle and upper-middle income (Figure 3), English common law and French civil law (Figure 4), Christian-dominated and Islam-oriented (Figure 5), landlocked and Not landlocked (Figure 6), Resource-rich and resource-poor (Figure 7), conflict-affected and conflict-free (Figure 8) and Sub-Saharan African and North African (Figure 9) countries. Conversely, the established evidence of beta catch-up within specific fundamental characteristics for particular terrorism dynamics in Tables 1-2 is traceable to specific phases of decreasing terrorism dispersions in respective Figures. We consistently notice that for fundamental characteristics for which we establish a consistent absence of catch-up (see English common law, Oil-rich, Oil-poor, Not-landlocked and Christian-dominated countries), with the exception of Petroleum-exporting countries for which high dispersions are not apparent in the starting phase (1983-1991), the high dispersions are consistently observable at the starting (1983-1991) and ending (2004-2012) phases.

Figure 1: Terrorism dispersions in Africa



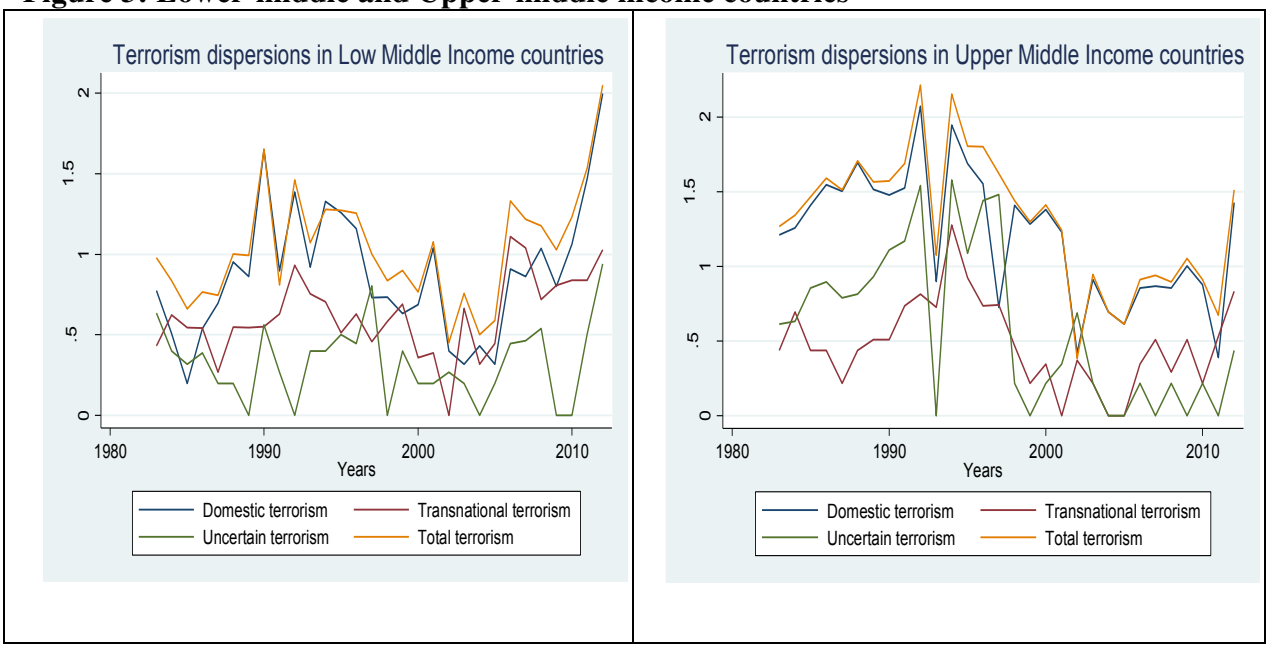
Source: Authors

Figure 2: Low and middle-income countries



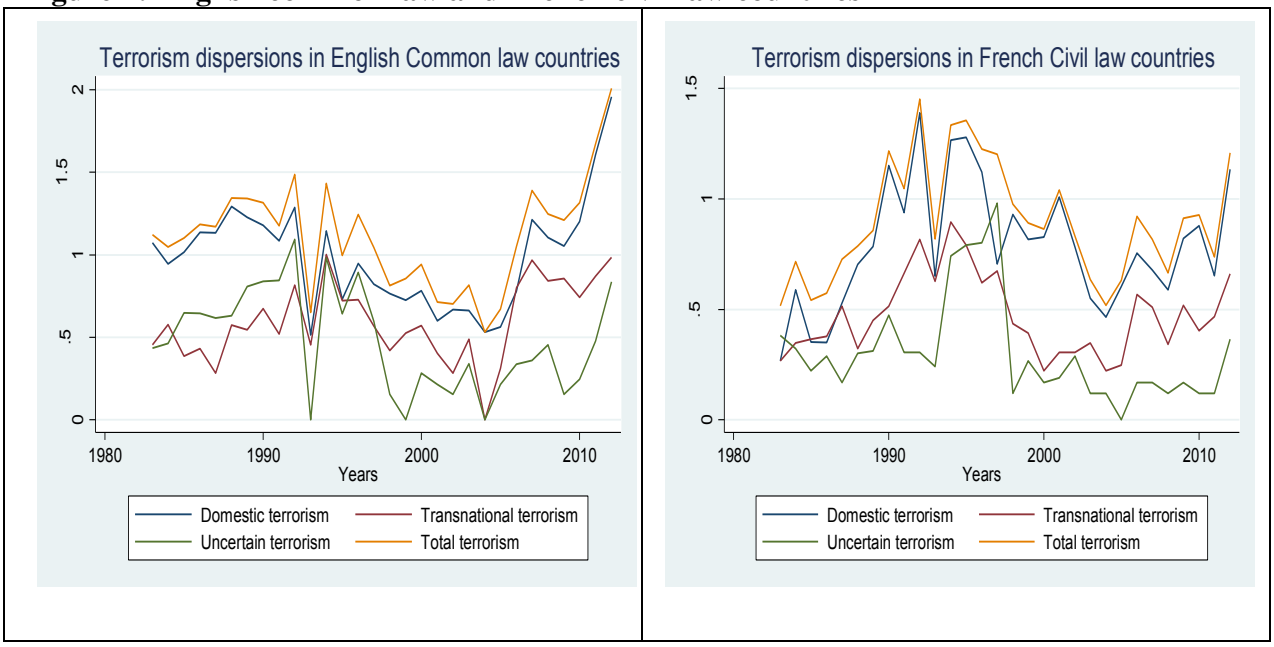
Source: Authors

Figure 3: Lower-middle and Upper-middle income countries



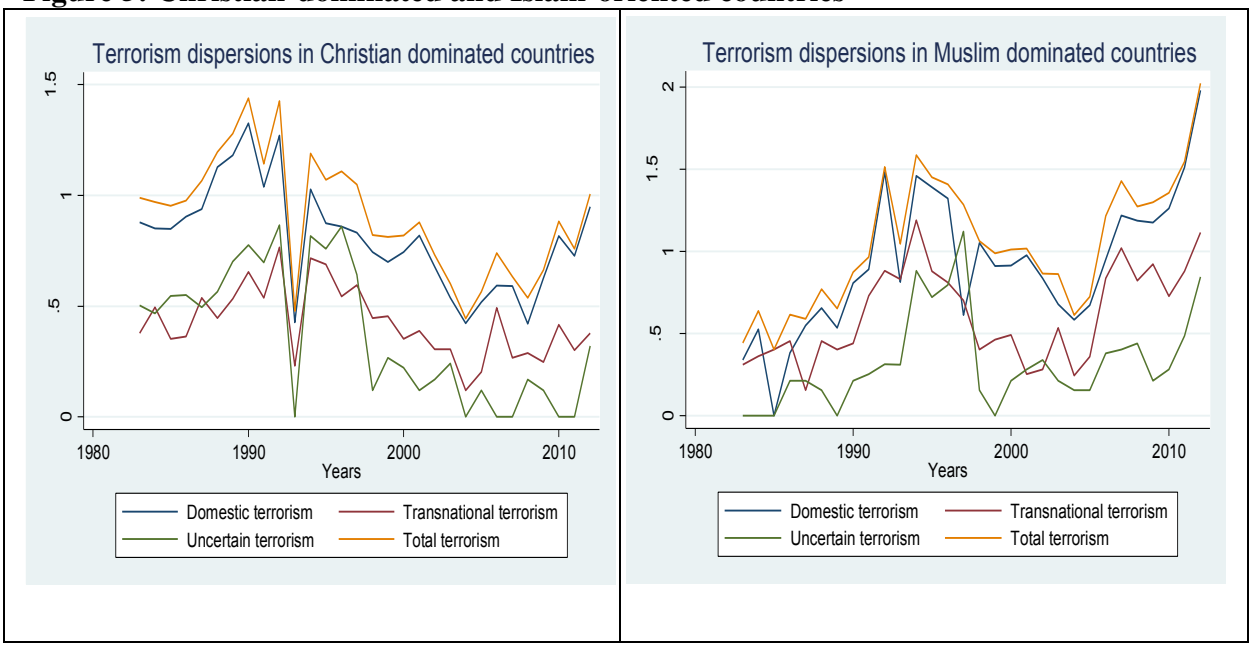
Source: Authors

Figure 4: English common law and French civil law countries



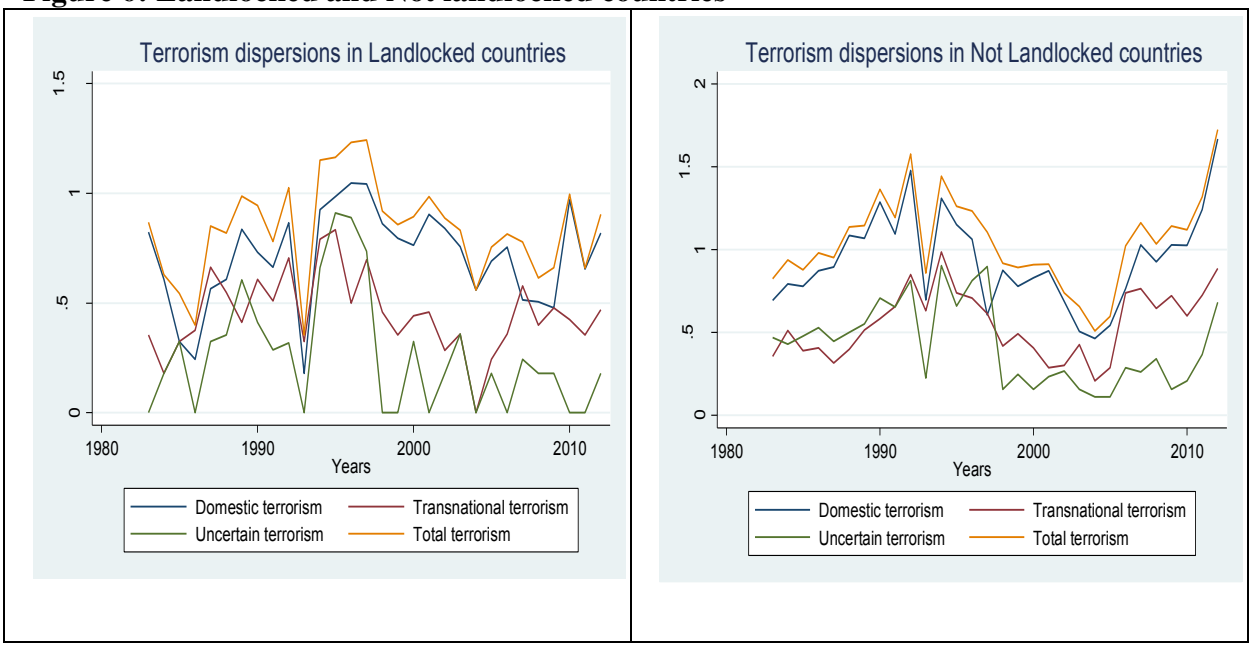
Source: Authors

Figure 5: Christian-dominated and Islam-oriented countries



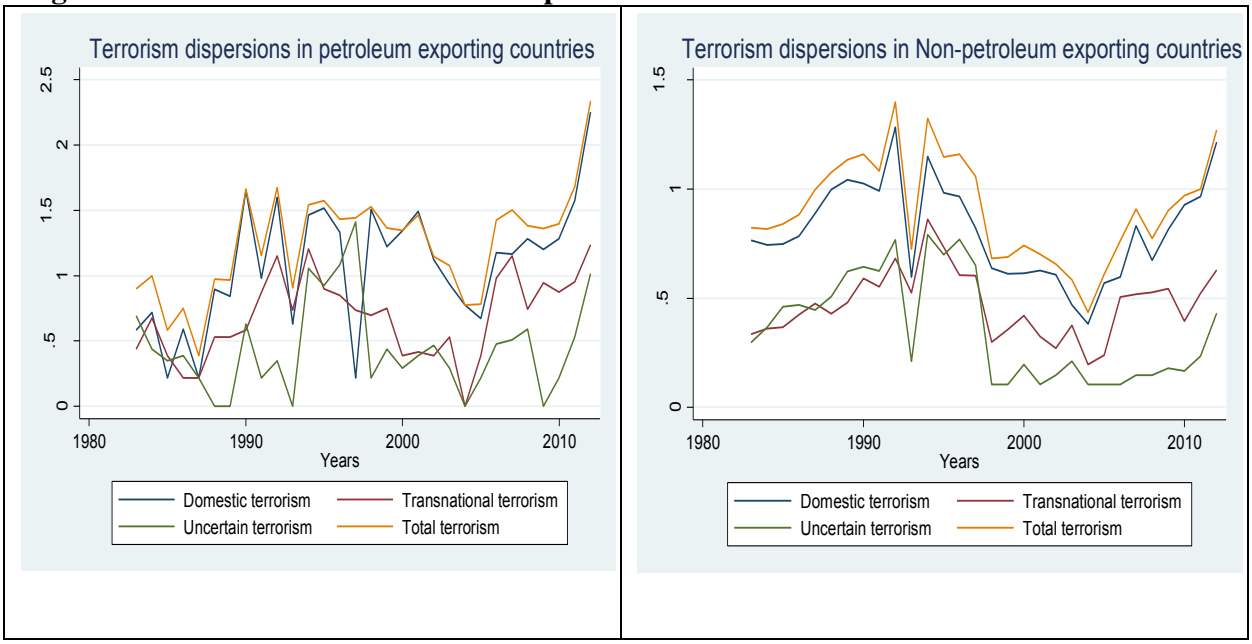
Source: Authors

Figure 6: Landlocked and Not landlocked countries



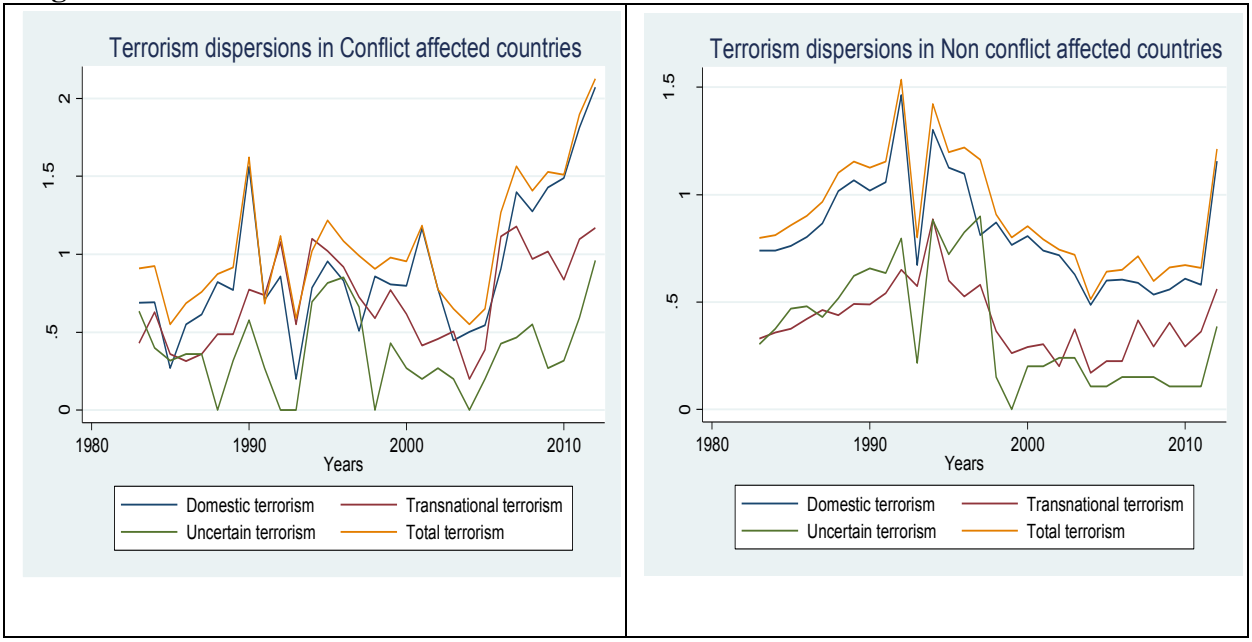
Source: Authors

Figure 7: Resource-rich and resource-poor countries



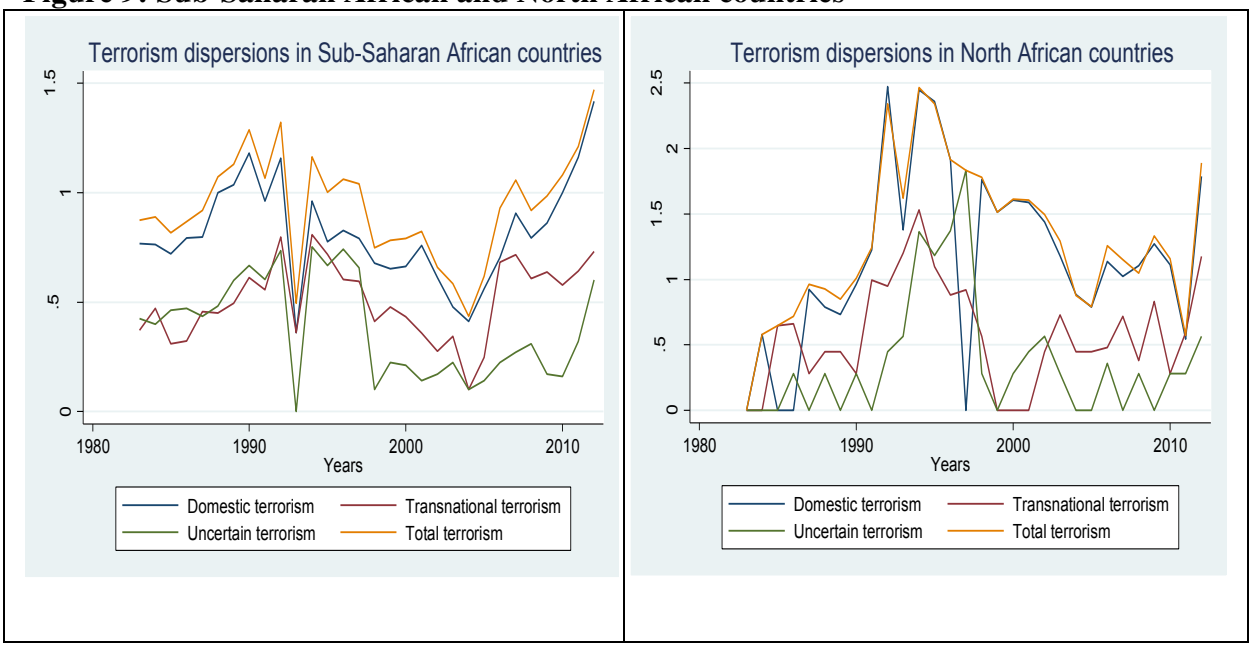
Source: Authors

Figure 8: Conflict affected and Non conflict affected countries



Source: Authors

Figure 9: Sub-Saharan African and North African countries



Source: Authors

4.4 Further discussion of results, implications and caveats

For reasons we have already outlined in the methodology section, it is more reasonable to build policy implications from the sigma convergence results. In spite of concerns about initial endowments and multiple equilibria that are associated with system GMM estimations, some researchers are increasingly distrustful of findings from system GMM that are partly based on a difference equation (see Roodman, 2007, 2008, 2009a; Bazzi & Clemens, 2010; Clemens et al., 2012). Unfortunately, the Roodman (2009ab) GMM extension that employs forward orthogonal deviations in place of fist differences has not been properly worked-out for the computation of the implied catch-up rate and time to full catch-up. Moreover, the estimation technique is not based on the use of non-overlapping intervals as means to limiting instrument proliferation because instruments are automatically collapsed in the modelling exercise.

In the light of this clarification, whereas policy implications would essentially build on the sigma convergence findings, it is important to note that the absolute beta convergence results have been useful in providing an overall perspective of the catch-up pattern, whereas the sigma approach has provided more insights into possible reasons for the presence or absence of catch-up. Hence, both methods are complementary because one informs the researcher on whether catch-up is significant whereas the other provides insights into specific periodic intervals that could elicit the established evidence of catch-up. Accordingly, we have observed from the sigma convergence results that the absence of significant catch-up from beta convergence results can be substantially explained by the 2004-2012 phase in terrorism dispersions which is consistently characterised by increasing cross-country differences in terrorist activities. It follows that in the contemporary era countries with low levels of terrorism are not catching-up their counterparts with high levels of terrorism. As a policy implication, whereas some common policies may be feasibly adopted for the fight against terrorism, the findings based on the last periodic phase (2004-2012) are indicative that country-specific policies would better pay-off in the fight than blanket common policies.

The above recommendations on the need for more emphasis on country-specific policies are consistent with the time to full catch-up required for policy harmonization in the corresponding absolute beta catch-up findings, which ranges from 39.13 to 174.90 years. This is in accordance with the European Union's position that the fight against terrorism is first and foremost an issue of national competence (European Commission, 2015). Analysing suggested country-specific factors would consist of probing-into idiosyncratic factors that are

fundamentally the root causes of terrorism in some countries. In essence, substantial evidence of divergence is an indication that such fundamental factors are not similar across sampled countries and homogenous panels. While, this recommendation is more aligned with domestic terrorism, transnational terrorism can be fought with better cross-country policy harmonisation or coordination.

The importance of policy coordination for transnational terrorism is in accordance with the 2014 Global Peace Index on an anticipated surge in terrorism activities in the coming years: "*Many macro 20 factors have driven the deterioration in peace over the last seven years including the continued economic repercussions of the Global Financial Crisis, the reverberations of the Arab Spring, and the continued spread of terrorism. As these effects are likely to continue into the near future; a strong rebound in peace is unlikely*" (Arnet, 2014). In the light of this anticipated surge, if transnational terrorism incidences increase as forecasted, the need for more policy harmonization may be as relevant as the need for country-specific policies established within the framework of this study. The following are some measures that can grease efforts towards cross-country policy initiatives: creation of a legal framework and environment for cooperation; harmonization of capabilities in regions that are visa-free for citizens of member countries; financing member states of the African Union (AU) in the area of internal and transnational security against terrorism and better coordination between front line actors and practitioners.

Hate speeches that permeate borders can be fought through the adoption of common legislations that combat xenophobia and racism as well as directives for audiovisual media services. Radicalization can be mitigated by means of networks sensitizing citizens of member states on the nefarious consequences of radicalization. The financing of terrorism can be prevented by instituting cross-country Terrorism Financing Tracking Systems (TFTS). The AU and other regional bodies need to substantially support member states affected by crises of terrorism. In essence, whereas crisis management as a result of terrorism attacks are for the most part concerns of national competence, developing effective fighting tools and supporting affected member states could help accelerate prevention and/or resolution of underlying crises. An example of such an initiative is the latest development against the Boko Haram. Accordingly, the AU's Peace and Security Council has recently validated a resolution for the adoption of a formal framework for a multinational joint task force involving affected countries, notably: Cameroon, Chad, Niger and Nigeria. Other measures that could be adopted in order to step-up the fight against terrorism include orientation of regional and AU's internal

security towards reinforcing internal security in order to address challenges posed by current and potential terrorists threats.

5. Conclusion and future research directions

This study has assessed the feasibility of policy harmonization in the fight against terrorism in 53 African countries with data for the period 1980-2012. Four terrorism variables have been used, namely: domestic, transnational, unclear and total terrorism dynamics. The empirical evidence is based on absolute beta catch-up and sigma convergence estimation techniques. The implied rates of catch-up and time to full catch-up are provided with the beta technique. In order to avail room for policy implications, the data is disaggregated into fundamental characteristics of African development, based on: legal origins (English common law vs. French civil law), political stability (conflict-affected vs. politically stable), resource-wealth (resource-rich vs. resource-poor), income levels (low- vs. middle-income), regional proximity (SSA vs. North Africa), openness to sea (landlocked and coastal) and religious domination (Islam vs. Christianity). The intuition for the analysis is that catch-up in terrorism indicates common policies against terrorism are feasible, while full catch-up implies that the underlying feasible policies can be implemented without distinction of nationality within a fundamental characteristic. The beta approach provides insights into evidence of catch-up whereas the sigma convergence strategy discloses periodicities that elicit the presence or absence catch-up. There is substantial absence of catch-up. The lowest rate of convergence in terrorism is in landlocked countries for regressions pertaining to unclear terrorism (3.43% per annum for 174.9 years) while the highest rate of convergence is in upper-middle-income countries in domestic terrorism regressions (15.33% per annum for 39.13 years).

After comparing results of the two estimation techniques, it is apparent that in the contemporary era, countries with low levels of terrorism are not catching-up their counterparts with high levels of terrorism. As a policy implication, whereas some common policies may be feasibly adopted for the fight against terrorism, the findings based on the last periodic phase (2004-2012) are indicative that country-specific policies would better pay-off in the fight than common blanket policies. The above recommendation on the need for more emphasis on country-specific policies is consistent with the time to full catch-up required for policy harmonization in the corresponding absolute beta catch-up findings.

While, this recommendation is more aligned with domestic terrorism, transnational terrorism can be more effectively fought with cross-country policy harmonisation or

coordination. However, if transnational terrorism incidences increase as anticipated by some reports, the need for more policy harmonization may be also as relevant as the need for country-specific policies. Some suggestions of measures in fighting transnational terrorism have been discussed in the light of an anticipated surge in cross-national terrorism incidences in the coming years.

Since terrorism can be contingent on revolutionary features that spread across nations, future studies devoted to extending the extant literature could focus on alternative estimation techniques like the employment of spatial models of econometrics in order to account for spillover and diffusion impacts. Another step in this direction may be to consider estimation techniques that capture the correlation between data subgroup events and other common events. The employment of Dynamic Conditional Correlation (Chiang et al., 2007; Al Rahahleh & Bhatti, 2017) and Copula (Ahsnaullah & Bhatti, 2010; Bhatti & Nguyen, 2012; Nguyen & Bhatti, 2012; Jong-Min & Jung, 2016) methodologies that are designed to analyze data into some extreme events are recommendable.

Appendices

Appendix 1: Categorization of Countries

Categories	Panels	Countries	Num
Income levels	Middle Income	Algeria, Angola, Botswana, Cameroon, Cape Verde, Côte d'Ivoire, Egypt, Equatorial Guinea, Gabon, Lesotho, Libya, Mauritius, Morocco, Namibia, Nigeria, Sao Tome & Principe, Senegal, Seychelles, South Africa, Sudan, Swaziland, Tunisia.	22
	Low Income	Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Congo Democratic Republic, Congo Republic, Djibouti, Eritrea, Ethiopia, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Sierra Leone, Somalia, Tanzania, Togo, Uganda, Zambia, Zimbabwe.	31
Legal Origins	English Common-law	Botswana, The Gambia, Ghana, Kenya, Lesotho, Liberia, Malawi, Mauritius, Namibia, Nigeria, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Uganda, Zambia, Zimbabwe.	20
	French Civil-law	Algeria, Angola, Benin, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo Democratic Republic, Congo Republic, Côte d'Ivoire, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Guinea, Guinea-Bissau, Libya, Madagascar, Mali, Mauritania, Morocco, Mozambique, Niger, Rwanda, Sao Tomé & Principe, Senegal, Togo, Tunisia.	33
Regions	Sub-Saharan Africa	Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Chad, Central African Republic, Comoros, Congo Democratic Republic, Congo Republic, Côte d'Ivoire, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Senegal, Sierra Leone, Somalia, Sudan, Rwanda, Sao Tomé & Principe, Seychelles, South Africa, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe.	47
	North Africa	Algeria, Egypt, Libya, Mauritania, Morocco, Tunisia.	6
Religion	Christianity	Angola, Benin, Botswana, Burundi, Cameroon, Cape Verde, Central African Republic, Congo Democratic Republic, Congo Republic, Côte d'Ivoire, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Ghana, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Rwanda, Sao Tomé & Principe, Seychelles, South Africa, South Africa, Tanzania, Togo, Uganda, Zambia, Zimbabwe.	33
	Islam	Algeria, Burkina Faso, Chad, Comoros, Djibouti, Egypt, The Gambia, Guinea, Guinea Bissau, Libya , Mali, Mauritania, Morocco, Niger, Nigeria, Senegal, Sierra Leone, Somalia, Sudan, Tunisia,	20
Resources	Petroleum Exporting	Algeria, Angola, Cameroon, Chad, Congo Republic, Equatorial Guinea, Gabon, Libya, Nigeria, Sudan.	10
	Non-Petroleum Exporting	Benin, Botswana, Burkina Faso, Burundi, Cape Verde, Central African Republic, Comoros, Congo Democratic Republic, Côte d'Ivoire, Djibouti, Eritrea, Ethiopia, Egypt, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Senegal, Sierra Leone, Somalia, Rwanda, Sao Tomé & Principe, Seychelles, South Africa, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.	43
Stability	Conflict	Angola, Burundi, Chad, Central African Republic, Congo Democratic Republic, Côte d'Ivoire, Liberia, Nigeria, Sierra Leone, Somalia, Sudan, Zimbabwe.	12
	Non-Conflict	Algeria, Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Comoros, Congo Republic, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger,	41

		Senegal, Rwanda, Sao Tomé & Principe, Seychelles, South Africa, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia.	
Openness to Sea	Landlocked	Botswana, Burkina Faso, Burundi, Chad, Central African Republic, Ethiopia, Lesotho, Malawi, Mali, Niger, Rwanda, Swaziland, Uganda, Zambia, Zimbabwe	15
	Not landlocked	Algeria, Angola, Benin, Cameroon, Cape Verde, Comoros, Congo Democratic Republic, Congo Republic, Côte d'Ivoire, Djibouti, Egypt, Equatorial Guinea, Eritrea, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Libya, Madagascar, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Senegal, Sierra Leone, Somalia, Sudan, Sao Tomé & Principe, Seychelles, South Africa, Tanzania, Togo, Tunisia.	38

Num: Number of cross sections (countries)

Appendix 2: Differences in the means of fundamental characteristics

Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		
Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
na	**(0.005)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.362)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.004)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.385)	**(0.000)**	Low
	na	**(0.000)**	**(0.000)**	(0.362)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.004)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.381)	Mid
		na	(0.341)	**(0000)**	**(0.000)**	(0.232)	**(0.000)**	(0.163)	**(0.000)**	(1.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	LMid
			na	**(0.000)**	**(0.000)**	(1.000)	**(0.000)**	**(0.095)**	**(0.000)**	(0.341)	**(0.000)**	**(0.000)**	**(0.009)**	**(0.000**	**(0.000)**	UMid
				na	**(0.000)**	**(0.000)**	**(0.000)**	**(0.014)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(1.000)	English
					na	**(0.000)**	**(0.000)**	**(0.000)**	**(0.014)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(1.000)**	**(0.000)**	French
						na	**(0.000)**	**(0.019)**	**(0.000)**	(0.232)	**(0.000)**	**(0.000)**	**(0.009)**	**(0.000)**	**(0.000)**	Oil
							na	**(0.000)**	**(0.019)**	**(0.000)**	(0.232)	**(0.009)**	**(0.000)**	**(0.000)**	**(0.000)**	NOil
								na	**(0.000)**	(0.124)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	Closed
									na	**(0.000)**	(0.124)	**(0.000)**	**(0.000)**	**(0.031)**	**(0.000)**	Open
										na	**(0.000)**	**(0.000)**	**(0.001)**	**(0.000)**	**(0.000)**	Conf
											na	**(0.001)**	**(0.000)**	**(0.000)**	**(0.000)**	NConf
												na	**(0.000)**	**(0.000)**	**(0.000)**	SSA
													na	**(0.000)**	**(0.000)**	NA
														na	**(0.000)**	Chrit
															na	Islam

Low: Low Income countries. Mid: Middle Income countries. LMid: Lower Middle Income countries. UMid: Upper Middle Income countries. English: English Common law countries. French: French Civil law countries. Oil: Petroleum Exporting countries. NoOil: Non-petroleum Exporting countries. Closed: Landlocked countries. Open: Countries open to the sea. Conf: Conflict Affected countries. NoConf: Countries not Affected by Conflicts. SSA: Sub-Saharan Africa. NA: North Africa. Chrit: Christian dominated countries. Islam: Muslim dominated countries. Null Hypothesis: Difference in means =0. P-values in brackets. Bold values represent significant differences in means at the 1%, 5% and 10% significance levels.

Appendix 3: Differences in the means of fundamental characteristics in terrorism dynamics

Panel A: Domestic Terrorism

Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		
Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
na	**(0.013)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.723)	**(0.000)**	**(0.000)**	**(0.000)**	(0.216)	**(0.000)**	(0.139)	**(0.000)**	**(0.000)**	(0.803)	**(0.002)**	Low
	na	**(0.000)**	**(0.000)**	(0.723)	**(0.000)**	**(0.000)**	**(0.000)**	(0.216)	**(0.000)**	(0.139)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.002)**	(0.803)	Mid
		na	**(0.001)**	**(0.055)**	**(0.000)**	(0.140)	**(0.000)**	(0.438)	**(0.000)**	(0.432)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.005)**	LMid
			na	**(0.000)**	**(0.000)**	**(0.005)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.696)	**(0.000)**	**(0.000)**	UMid
				na	**(0.003)**	**(0.002)**	**(0.000)**	(0.258)	**(0.000)**	(0.205)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.597)	English
					na	**(0.000)**	**(0.002)**	**(0.000)**	(0.258)	**(0.000)**	(0.205)	**(0.000)**	**(0.000)**	(0.597)	**(0.000)**	French
						na	**(0.000)**	**(0.000)**	**(0.052)**	**(0.017)**	**(0.000)**	**(0.000)**	**(0.030)**	**(0.000)**	**(0.000)**	Oil
							na	**(0.000)**	**(0.052)**	**(0.000)**	**(0.017)**	**(0.030)**	**(0.000)**	**(0.000)**	**(0.000)**	NOil
								na	**(0.000)**	(0.904)	**(0.000)**	**(0.000)**	**(0.000)**	(0.149)	Closed
									na	**(0.000)**	(0.904)	**(0.000)**	**(0.000)**	(0.149)	**(0.000)**	Open
										na	**(0.000)**	(0.000)	**(0.000)**	**(0.000)**	**(0.079)**	Conf
											na	**(0.000)**	**(0.000)**	**(0.079)**	**(0.000)**	NConf
												na	**(0.000)**	**(0.000)**	**(0.000)**	SSA
													na	**(0.000)**	**(0.000)**	NA
														na	**(0.031)**	Chrit
															na	Islam

Panel B: Transnational Terrorism

Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		
Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
na	**(0.047)**	**(0.002)**	**(0.000)**	**(0.000)**	(0.250)	**(0.000)**	**(0.001)**	**(0.000)**	(0.234)	**(0.001)**	(0.702)	**(0.000)**	**(0.000)**	(0.437)	**(0.061)**	Low
	na	**(0.003)**	**(0.000)**	(0.250)	**(0.001)**	**(0.001)**	**(0.000)**	(0.243)	**(0.000)**	(0.702)	**(0.001)**	**(0.000)**	**(0.000)**	**(0.061)**	(0.437)	Mid
		na	**(0.000)**	(0.895)	**(0.000)**	(0.195)	**(0.000)**	(0.908)	**(0.000)**	(0.329)	**(0.000)**	**(0.000)**	**(0.001)**	**(0.002)**	**(0.024)**	LMid
			na	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.007)**	**(0.000)**	**(0.000)**	UMid
				na	**(0.000)**	(0.226)	**(0.000)**	(0.782)	**(0.000)**	(0.356)	**(0.000)**	**(0.000)**	**(0.007)**	**(0.000)**	**(0.080)**	English
					na	**(0.000)**	(0.226)	**(0.000)**	(0.782)	**(0.000)**	(0.356)	**(0.007)**	**(0.000)**	**(0.080)**	**(0.000)**	French
						na	**(0.000)**	(0.380)	**(0.000)**	**(0.018)**	**(0.000)**	**(0.000)**	**(0.057)**	**(0.000)**	**(0.000)**	Oil
							na	**(0.000)**	(0.380)	**(0.000)**	**(0.018)**	**(0.057)**	**(0.000)**	**(0.000)**	**(0.000)**	NOil
								na	**(0.000)**	(0.295)	**(0.000)**	**(0.000)**	**(0.014)**	**(0.000)**	**(0.062)**	Closed
									na	**(0.000)**	(0.295)	**(0.014)**	**(0.000)**	**(0.062)**	**(0.000)**	Open
										na	**(0.011)**	**(0.000)**	**(0.011)**	**(0.011)**	(0.303)	Conf
											na	**(0.001)**	**(0.000)**	(0.303)	**(0.011)**	NConf
												na	**(0.000)**	**(0.000)**	**(0.000)**	SSA
													na	**(0.000)**	**(0.000)**	NA
														na	(0.283)	Chrit
															na	Islam

Panel C: Unclear Terrorism

Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		
Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
na	**(0.069)**	**(0.001)**	**(0.000)**	**(0.057)**	(0.519)	**(0.000)**	**(0.000)**	**(0.000)**	(0.495)	**(0.002)**	(0.496)	**(0.000)**	**(0.000)**	(0.567)	**(0.068)**	Low
	na	**(0.001)**	**(0.000)**	(0.519)	**(0.057)**	**(0.000)**	**(0.000)**	(0.497)	**(0.000)**	(0.496)	**(0.002)**	**(0.000)**	**(0.000)**	**(0.068)**	(0.567)	Mid
		na	**(0.047)**	**(0.025)**	**(0.000)**	(0.109)	**(0.000)**	(0.459)	**(0.000)**	(0.222)	**(0.000)**	**(0.000)**	**(0.006)**	**(0.001)**	**(0.008)**	LMid
			na	**(0.000)**	**(0.000)**	(0.227)	**(0.000)**	**(0.005)**	**(0.000)**	**(0.004)**	**(0.000)**	**(0.000)**	(0.765)	**(0.000)**	**(0.000)**	UMid
				na	(0.368)	**(0.000)**	**(0.000)**	(0.140)	**(0.007)**	(0.131)	**(0.022)**	**(0.000)**	**(0.000)**	(0.117)	(0.882)	English
					na	**(0.000)**	**(0.000)**	**(0.007)**	(0.140)	**(0.022)**	(0.131)	**(0.000)**	**(0.000)**	(0.882)	(0.117)	French
						na	**(0.000)**	**(0.085)**	**(0.000)**	**(0.006)**	**(0.000)**	**(0.000)**	(0.134)	**(0.000)**	**(0.000)**	Oil
							na	**(0.000)**	**(0.085)**	**(0.000)**	**(0.006)**	(0.134)	**(0.000)**	**(0.000)**	**(0.000)**	NOil
								na	**(0.002)**	(0.874)	**(0.000)**	**(0.000)**	**(0.003)**	**(0.000)**	(0.250)	Closed
									na	**(0.000)**	(0.874)	**(0.003)**	**(0.000)**	(0.250)	**(0.000)**	Open
										na	**(0.005)**	**(0.000)**	**(0.002)**	**(0.007)**	(0.252)	Conf
											na	**(0.002)**	**(0.000)**	(0.252)	**(0.007)**	NConf
												na	**(0.000)**	**(0.000)**	**(0.000)**	SSA
													na	**(0.000)**	**(0.000)**	NA
														na	(0.260)	Chrit
															na	Islam

Panel D: Total Terrorism

Income Levels				Legal Origins		Petroleum		Openness to sea		Stability		Regions		Religion		
Low	Mid	LMid	UMid	English	French	Oil	NOil	Closed	Open	Conf	NConf	SSA	NA	Chrit	Islam	
na	**(0.007)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.736)	**(0.000)**	**(0.000)**	**(0.000)**	(0.139)	**(0.000)**	**(0.065)**	**(0.000)**	**(0.000)**	(0.811)	**(0.001)**	Low
	na	**(0.000)**	**(0.000)**	(0.736)	**(0.001)**	**(0.000)**	**(0.000)**	(0.139)	**(0.000)**	**(0.065)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.001)**	(0.811)	Mid
		na	**(0.001)**	**(0.032)**	**(0.000)**	(0.116)	**(0.000)**	(0.454)	**(0.000)**	**(0.530)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.002)**	LMid
			na	**(0.000)**	**(0.000)**	**(0.013)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.591)	**(0.000)**	**(0.000)**	UMid
				na	**(0.001)**	**(0.000)**	**(0.000)**	(0.157)	**(0.000)**	**(0.089)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.620)	English
					na	**(0.000)**	**(0.000)**	**(0.000)**	(0.157)	**(0.000)**	**(0.089)**	**(0.000)**	**(0.000)**	(0.620)	**(0.000)**	French
						na	**(0.000)**	**(0.023)**	**(0.000)**	**(0.023)**	**(0.000)**	**(0.000)**	**(0.076)**	**(0.000)**	**(0.000)**	Oil
							na	**(0.000)**	**(0.046)**	**(0.000)**	**(0.023)**	**(0.076)**	**(0.000)**	**(0.000)**	**(0.000)**	NOil
								na	**(0.000)**	(0.814)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.090)**	Closed
									na	**(0.000)**	(0.814)	**(0.000)**	**(0.000)**	**(0.090)**	**(0.000)**	Open
										na	**(0.000)**	**(0.000)**	**(0.001)**	**(0.000)**	**(0.034)**	Conf
											na	**(0.001)**	**(0.000)**	**(0.034)**	**(0.000)**	NConf
												na	**(0.000)**	**(0.000)**	**(0.000)**	SSA
													na	**(0.000)**	**(0.000)**	NA
														na	**(0.018)**	Chrit
															na	Islam

Low: Low Income countries. Mid: Middle Income countries. LMid: Lower Middle Income countries. UMid: Upper Middle Income countries. English: English Common law countries. French: French Civil law countries. Oil: Petroleum Exporting countries. NoOil: Non-petroleum Exporting countries. Closed: Landlocked countries. Open: Countries open to the sea. Conf: Conflict Affected countries. NoConf: Countries not Affected by Conflicts. SSA: Sub-Saharan Africa. NA: North Africa. Chrit: Christian dominated countries. Islam: Muslim dominated countries. Null Hypothesis: Difference in means =0. P-values in brackets. Bold values represent significant differences in means at the 1%, 5% and 10% significance levels.

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