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Conflict–Poverty Relationship in Africa: A Disaggregated Approach

Olalekan Charles Okunlola[1] and Ifeanyi Gerald Okafor[1]

Abstract

This article investigates the conflict–poverty relationship in Africa between 1980 and 2015. Conducting a panel regression, we test the effect of disaggregated conflict on the poverty index (POV) and indicators in Africa. Conflict causes poverty in Africa, and not the other way round as many studies have suggested. We also found that internal conflict causes poverty in Africa; it increases the poverty rate and worsens the standard of living. However, interstate conflicts have little effects on poverty indicators, it reduces the life expectancy of people in Africa. This article concludes that poverty is not the prime cause of conflict in Africa; there are other causes (i.e., political, structural, and sociological), poverty only stimulates conflict. This article suggests that peacemaking and peacebuilding mechanisms should be strengthened in Africa. Also, emphasis should be laid on other causes of conflict, such as political, structural and sociological, as it has been established that poverty is not the cause of conflict in Africa.

Keywords

Africa, conflict, panel regression, poverty

Introduction

Poverty has remained a major problem in many countries in the World. It is more endemic among developing countries, particularly Africa. Many of the poorest

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people in the world are believed to live in the world's poorest countries. In 2013, an estimated 767 million people (about 10 per cent) were living under the international poverty line of $1.90 a day (World Bank, 2016). Although the 2013 estimate shows a downward trend in the poverty headcount ratio since 1990 (an average of 1.1 percentage points per year) at the global level, Africa contributed very little in the downward trend as it hosts more than half of the poor in 2013. The April 2015 World Bank report on attainment of the Millennium Development Goal (MDG) on extreme poverty target revealed that extreme poverty has been decreasing in all regions of the world particularly except for sub-Saharan Africa (SSA), despite that the sub-region was enjoying more than two decades of growth resurgence (World Bank, 2015). In Africa, poverty manifests in the income level, health, education, access to land and other resources, rural life, and consumption pattern.

There is evidence that the material wellbeing of a vast majority of the population in developing countries particularly Africa has not substantially improved. Several policies have been put in place to eradicate poverty in Africa. The MDG of halving world poverty had very significant progress globally, though with a little less than average progress in Africa. Also, the first in the sustainable development goals created in 2015 was to end extreme poverty in ALL forms by 2030. The eradication of extreme poverty is a key component in the post-2015 MDGs process and the African Union's Agenda 2063 (Turner, Cilliers, & Hughes, 2015).

Aside from the global effort, there are subregional and national efforts by various national governments to eradicate poverty. Verbeek (2017), a World Bank representative to the United Nations, claimed that one of the key elements to end poverty and reduce inequality at a faster pace is to build resilience globally and domestically to (a) emerging shocks like pandemics, climate fragility and conflict, and to (b) traditional shocks as it relates to macro-economy and trade. In several cases, economic growth has been accompanied by growing inequality, exclusion and marginalisation of the larger parts of the population (Verstengen, 2001). Many of these African countries have witnessed a substantial number of violent conflicts. It is however assumed that poverty and social exclusion are causes of conflict. On the other hand, violent conflict contributes to poverty by causing: damage to infrastructure, institutions and production; the destruction of assets; the breakup of communities and social networks; forced displacement; increased unemployment and inflation; changes in access to and relationship with local exchange, employment, reducing human development, credit and insurance markets; falls in spending on social services; and death and injury to people (Addison et al., 2010; Baddeley, 2011; Justino, 2010; ACAPS and MapAction, 2013; Justino & Verwimp, 2013; McGillivray & Noorbakhsh, 2004; USAID, 2014). ~~Conflicts also cause Displaced households~~ and households with widows, orphans, elderly and disabled individuals are most vulnerable to falling into poverty as a result of a conflict (Addison et al., 2010; Justino, 2010). Households which are already poor, risk falling further into poverty (Addison et al., 2010).

The direction of causality in the conflict–poverty relationship is in contention in literature. While some scholars believed that conflict is the cause of poverty, others claim that conflict is a consequence of poverty. It is in light of this that this

study examines the direction of causality of the conflict–poverty relationship from a disaggregated perspective. This study further investigates the relationship between conflict and poverty in Africa from 1980 to 2015. ~~This study is conducted using a disaggregated perspective of conflict and poverty in Africa.~~ This article contributes to the literature in two significant ways. First, contrary to many works in the literature, this article uses a disaggregated perspective of the conflict–poverty relationships, by breaking down conflict into (a) internal/civil conflict which includes civil violence and warfare, ethnic violence and warfare involving a state, and (b) interstate/international conflict which includes international violence and warfare involving a state, warfare occurring in a non-independent state and/or associated with an attempt to gain independence for the state. Rather than using a single indicator of poverty, this article uses four indicators which ~~are variously~~ used in the literature to measure poverty. It uses GDP per capita to capture economic wellbeing, consumption per capita to capture standard of living, agricultural value-added per worker to capture rural poverty and life expectancy to capture the capability of leading a long and healthy life, while it computes a multidimensional index for poverty using the four indicators.

Secondly, this article controls for the effects of other causes of poverty including, amongst others, natural disasters, corruption and good governance. In taking account of such factors, our approach potentially circumvents problems associated with omitted variable bias and minimises the possibility that other economic mechanisms are driving the results that suggest an increase in violent conflict gives rise to greater poverty. Also, this article simultaneously controls for country-specific factors like the quality of the institution and economic development. The remainder of this article is structured as follows: Section 2 reviews the characteristics and trend of conflict in Africa. Section 3 reviews relevant literature on the relationship between conflict and poverty. Section 4 outlines data sources and methodology. Section 5 presents the findings and discusses the implication of the results. Finally, Section 6 summarises our findings and concludes the article.

Characteristics and Trend of Conflict in Africa

The levels and forms of conflict across the developing world are changing in response to political and economic volatility within countries. Africa is an abode to an array of violence as it is distributed across rural and urban areas, executed by a variety of groups, subject to quick in leadership, prone to splintering, and often strongly shaped by the ethnic-regional characteristics of states (Raleigh, Dowd, & Linke, 2013). Also, states are often distinctive in the types of violent conflict that dominate their patterns of political violence. Africa is an extremely volatile regional sub-system in the globalising world-system; pervasive and persistent violence has confounded efforts to improve economic capacity and performance in the region.

According to Marshall (2006), the magnitude of major armed conflict increased rapidly during the 1980s, while the general trend reversed in the 1990s and has

decreased by nearly 50 per cent since its peak in 1991. The vast majority of armed conflicts since 1955 have been societal (ethnic, communal, and revolutionary) wars; international wars are largely accounted as wars of independence during the decolonisation period. Also, the forcibly displaced population skyrocketed from the mid-1980s through the early 1990s; the numbers fell sharply (by about half) in the mid-1990s and have risen slowly since. 'State-formation instability' and 'post-formation instability' combined to keep general levels of instability quite high in Africa since the first wave of independence in 1960. 'State formation instability' is largely explained either by 'political factionalism' in more open political systems or 'exclusivity' by ruling elites in more autocratic states, while 'Post-formation instability' is explained by varying combinations of dependency, polarisation, unmanageability, leadership succession, neighbourhood (spillover) effects, and large Muslim population.

Furthermore, most regimes in Africa are characterised by mixed democratic and autocratic traits; ethnic exclusivity of ruling elites remains high. The problem of extreme failures of states doubled in the 1990s, affecting about 10 per cent of African countries (Marshall, 2006). And despite the increase in the number of democratic regimes (i.e, from 3 in 1989 to 13 in 2004 and 15 in 2015), the conflict has not drastically responded to the change in the form of governance in Africa. There is also evidence of a dramatic increase in both the number and level of violence of inter-communal conflicts in the 1990s, although this may be partly explained by an increase in media reporting since the end of the Cold War.

The history of Africa as a continent is replete with conflict (Alabi, 2006, p. 41). Since the 1960s, series of civil war had taken place in Africa, spanning through the 1970s, 1980s, 1990s, and 2000s. some examples of these conflicts include Chad (1965–1985), Nigeria (1967–1970), Angola since 1974, Liberia (1980–2003), Burundi (1993–2005), Rwanda (1990–1994), Sierra Leone (1991–2001), Sudan (1995–1990), and Somalia (1991–2015+). Aside from civil wars, African countries also witnessed several recurrent borders and inter-state conflicts which include among others: Nigeria-Cameroon dispute over Bakassi peninsular since the 1970s; Algeria–Morocco conflict over the Atlas Mountains area in October 1963; Eritrea–Ethiopian crisis between 1962 and 1979; Somalia–Ethiopia` dispute of 1964–1978 over the Ugandan desert region; Chad–Libya crisis of 1980–1982; Kenya–Somalia border war of 1963–1967 in which Somalia aimed at recovering its lost territories including the Northern frontier district of Kenya; Tanzania–Uganda crisis in 1978–1979 (Barkindo et al, 1994, pp. 279–32l; Cook & Killingray, 1983, pp. 183–84; Europa, 1987, p. 187).

Africa has also experienced other forms of crisis which ranges from ethnic wars and violence, insurgencies and banditry. Data sourced from Centre for Systematic Peace, Benjamin Petrini,[1] Wikipedia and other sources in Table 1 shows the summary of characteristic and trend of armed conflict in Africa. This table shows the date the conflict began and ended, the type of conflict, countries involved, brief description, and fatalities.

[AQ6]

Table 1. Characteristics and Trend of Violent Conflict in Africa (1980–2015)

Begin	End	Type	States Directly Involved	Brief Description	Deaths	Battle Deaths	High Estimate
1965	1994	EV	Chad	Ethnic Violence	75,000[2]		
1974	1991	CW	Ethiopia	Civil War (EPRDF & EPLF)	25,000[3]		
1975	1989	CW	Mauritania (1979) Morocco	Colonial war (Western Sahara) 3	15,000		
1975	2002	CW	Angola	Civil war (UNITA)	1,000,000	16,0,500	1,50,0,000
1975	2004+	CV	Angola	Civil violence (Cabinda separatists; FLEC)	3,500	815	
1980	1985	EV	Nigeria	Ethnic violence (Islamic groups)	9,000		
1981	*	CV	Gambia	Coup attempt	650	650	800
1981	*	CV	Ghana	Civil violence (Konkomba vs Nanumba)	1,000		
1981	1986	CW	Uganda	Repression of dissidents	1,00,000	1,08,000	
1981	1987	EV	Zimbabwe	Ethnic violence (Ndebele)	3,000		
1981	1992	CW	Mozambique	Civil war (Govt vs RENAMO)	5,00,000	1,45,000	1,000,000
1982	*	IW		International war (Ethiopian–Somali Border War)	Unknown		
1983	1996	EW	South Africa	Ethnic/civil warfare	20,000	4,000	27,000
1983	2002	EW	Sudan	Ethnic war (Islamic vs African)	1,000,000	55,500	23,00,000
1984	*	CV	Cameroon	Coup attempt	750	500	
1984	*	EV	Zaire	Ethnic/civil warfare	1,000		
1985	*	CW	Liberia	Repression of dissidents (failed coup)	5,000		
1986	1993	EV	Nigeria	Communal violence (Muslim-Christian)	10,000		
1986	2004+	EV	Uganda	Ethnic violence (Langi and Acholi); LRA	12,000	4,600	
1988	*	EV	Burundi	Ethnic violence (Tutsis against Hutus)	10,000		50,000
1991	2015+	CW	Somalia	Civil war[4]	3,00,000	50,000	3,50,000
1989	1990	IV	Mauritania Senegal	International violence	500		

[AQ7]

(Table 1 continued)

(Table I continued)

Begin	End	Type	States Directly Involved	Brief Description	Deaths	Battle Deaths	High Estimate
1990	1994	EW	Rwanda	Ethnic warfare (Tutsis v Hutu regime) 6	15,000	5,500	
1990	1995	EV	Mali	Ethnic violence (Tuareg)[5]	1,000	200	2,000
1990	1997	CV	Liberia	Civil war	40,000	23,500	2,00,000
1990	1997	EV	Niger	Ethnic violence (Azawad and Toubou)	1,000	500	1,500
1991	*	CV	Burundi	Civil violence	1,000	750	3,000
1991	1993	EV	Kenya	Ethnic violence (Kalenjin, Masai, Kikuyu, Luo)	2,000		
1991	1994	CW	Djibouti	FRUD rebellion	1,000	400	5,000
1991	2001	CW	Sierra Leone	Civil-Ethnic warfare (RUF, Mende)	25,000	13,000	50,000
1991	2002	CW	Algeria	Civil War (Islamic Rebels: FIS; GIA;AIS)	1,50,000[6]		
1992	1996	EV	Zaire	Ethnic violence	10,000		
1992	1999	EV	Senegal	Casamance separatism	3,000	1,600	
1993	*	EV	Congo-Brazzaville	Ethnic violence	2,000	175	
1992	1999	EV	Egypt	Ethnic Violence (al-Gama'a al-Islamiyya)	2,000		
1993	2005	CV	Burundi	Burundi Civil War	3,00,000[7]		
1993	2008	EW	Burundi	Ethnic warfare (Tutsis against Hutus)	1,00,000	6,000	2,00,000
1994	*	EW	Rwanda	Ethnic violence (Hutus target Tutsis) 6	5,00,000		1,000,000
1994	*	EV	Ghana	Ethnic violence	1,000		5,000
1994	1998	EW	Rwanda	Ethnic warfare (Hutus vs Tutsi regime) 6	15,000	4,000	2,00,000
1996	1996	IV	Cameroon, Nigeria	International Violence	76–200		
1996	2008	CW	Dem. Rep. of Congo (Zaire)	Civil War (ouster of Mobutu & aftermath)	1,500,000	1,49,000	2,500,000
1997	1999	CW	Congo-Brazzaville	Civil warfare	10,000	8,500	

1997	2003	EV	Eritrea	Ethnic violence	344	
1997	2004+	EV	Nigeria	Communal violence (Delta province; Ijaw, Itsekeri,and others)	1,500	
1998	*	CV	Lesotho	Civil violence (May elections)	1,000	114
1998	1999	CW	Guinea-Bissau	Coup attempt; civil war	6,000	1,850
1998	1999	CW				
1998	2000	IW	Eritrea-Ethiopia	Interstate war	1,00,000	50,000
1999	2000	EW	Ethiopia	Oromo separatists	2,000	1,500
1999	2002	CW	Namabia	UNITA civil war	414	
2000	2001	CV	Guinea	Fighting in Parrot's Beak	1,000	1,100
2000	2003	CV	Liberia	Civil violence (attacks by LURD guerrillas)	1,000	750
2000	2004	CW	Ivory Coast	Civil war (north, south, and west divisions)	3,000[8]	600
2001	*	EW	Rwanda	Attacks by Hutu rebels	2,500	
2001	2003	CV	Central African Rep.	Civil violence (attacks by Bozize loyalists; coup)	1,000	219
2001	2004	EV	Nigeria	Ethnic violence (Christian-Muslim; Plateau, Kano regions)	55,000	
1997	2008	EV	Comoros	Ethnic Violence (MPA/Republic of Anjouan)	46[9]	
2002	*	EV	Ghana	Ethnic Violence (Abudu-Andani crisis)	36	
2002	2003	CV	Congo-Brazzaville	Civil violence (Ninja militants in Pool region)	500	116
2003	2004+	EV	Sudan	Communal-separatist violence in Darfur	35,000	4,00,000
1975	2007	CW	Angola	FLEC–FAC and FLEC–R Armed Struggle	3,500	

(Table 1 continued)

(Table 1 continued)

Begin	End	Type	States Directly Involved	Brief Description	Deaths	Battle Deaths	High Estimate
2004	2015+	EV	Nigeria	Ethnic Ijaws inhabited oil-rich Niger Delta. Fight for self-determination and control/participation in oil benefits.	Unknown		
2004	2007	CW	Central African Rep.	Civil war (Rebellion by UFDR)	45		
2005	2010	CW	Chad	Civil war (between Arab Muslims and Subsaharan-Christians)	4,000		
2006	2008	EV	Kenya	Rebellion in Mt. Elgon	800		
2007	2008	EV	Niger	Ethnic violence (MNJ/Tuareg)	70		
2007	2009	EV	Mali	Ethnic violence (Tuareg)	60		
2008	*	IV	Djibouti-Eritrea	International violence (Djiboutian-Eritrean Border Conflict)	144[10]		
2008	*	CV	Kenya	Communal violence following disputed presidential election.	1500		
2009	2015	EV	Nigeria	Ethnic violence (Boko Haram Insurgency)	51,567-+[11]		
2011	2014	CV	Egypt	Egyptian revolution of 2011	846[12]		
2011	2016	CW	Libya	Libyan civil war	2011– 2012:1096[13]; 2014:233[14]		
2012	2014	CW	Central African Rep.	Civil war iInvolving the Government, Seleka coalition and Anti-balaka Militias).	5186-+[15]		
2013	2014	CV	Tunisia	Tunisian political Crisis	Unknown		

Table 2a. Result of the Granger Causality Test between Conflict and Poverty [AQ8,9]

Model	Null Hypothesis	F-Stats	P-value
A	*CIVCF* does not Granger Cause *AGVPW*	6.376	0.002
	AGVPW does not Granger Cause *CIVCF*	0.532	0.588
B	*CIVCF* does not Granger Cause *COMPC*	6.794	0.001
	COMPC does not Granger Cause *CIVCF*	2.022	0.133
C	*CIVCF* does not Granger Cause *GDPPC*	5.789	0.003
	GDPPC does not Granger Cause *CIVCF*	1.238	0.2902
D	*CIVCF* does not Granger Cause *LEXP*	8.311	0.0003
	LEXP does not Granger Cause *CIVCF*	8.4308	0.0002
E	*CIVCF* does not Granger Cause *POV*	4.86626	0.0078
	POV does not Granger Cause *CIVCF*	1.33144	0.2644

Note: *F*-Statistics and *P*-values are presented.

Table 2b. Result of the Granger Causality Test between International/Interstate Conflict and Poverty

Model	Null Hypothesis	F-Stats	P-value
A	*INTCF* does not Granger Cause *AGVPW*	0.054	0.947
	AGVPW does not Granger Cause *INTCF*	1.565	0.209
B	*INTCF* does not Granger Cause *COMPC*	0.038	0.963
	COMPC does not Granger Cause *INTCF*	0.102	0.903
C	*INTCF* does not Granger Cause *GDPPC*	0.217	0.805
	GDPPC does not Granger Cause *INTCF*	2.324	0.098
D	*INTCF* does not Granger Cause *LEXP*	3.621	0.027
	LEXP does not Granger Cause *INTCF*	8.969	0.0001
E	*INTCF* does not Granger Cause *POV*	0.239	0.787
	POV does not Granger Cause *INTCF*	2.368	0.094

Note: *F*-Statistics and *P*-values are presented.

Conflict–Poverty Relationship: Evidence from the Literature

[AQ3]

Since the fall of the Berlin Wall, about four million people have been killed in internal and regionalised forms of conflict. It has been estimated that one-third of the world's population is exposed to armed conflict and more than half of the countries in Africa are affected by armed conflicts. The political scientists have offered an account of the conflict in terms of motive. It is believed that rebellion occurs when grievances are sufficiently acute that people want to engage in violent protest. Also, works of economists like Grossman (1991, 1999), modelled rebellion as an industry that generates profits from looting, so that 'the insurgents are indistinguishable from bandits or pirates (Grossman, 1999, p. 269)'.

The 'greed and grievance' theory provides opposing arguments on the cause of civil war. The proponents of the greed argument posit that armed conflicts are caused by a combatant's desire for self-enrichment (Collier & Hoeffler, 2002). These motivations may come in the form of economic gain through control of goods and resources or by increased power within a given state. The conflicts that have their origin from greed are often seen in states with adverse economic growth and/or systemic poverty as this implies limited state capacity to provide opposition groups with economic concessions as well as the likelihood of the absence of an effective military or police apparatus to contend with those seeking power or resources. Collier and Hoeffler (2002) found that increasing the military or financial viability of rebellion correlated with more instances of conflict than factors leading to grievances. They argue that certain natural resources such as oil are tied to an increased likelihood of conflict onset, and other natural resources such as diamonds are tied to increases in conflict duration. In their work, Collier and Hoeffler also conclude that states with low per capita GDP are more likely to experience civil war because low average income makes wage-earning through conflict a more lucrative prospect.

Furthermore, Collier and Hoeffler (2002) claim that faster economic growth reduces the risk of conflict because it raises the opportunity costs of joining a rebellion. On the other hand, grievances are often seen as the main causes of rebellion. 'Grievance' stands for the argument that people rebel over issues of identity, for example, ethnicity, religion, social class, and so on, rather than over economics. However, Collier and Hoeffler (2002) found little evidence for grievance as a determinant of conflict. They claimed that neither inequality nor political oppression increases the risk of conflict. They, however, found some evidence that societies characterised by ethnic dominance have a systematically higher risk of civil war. In their work, the greed components show much more power of influencing conflict than the grievance components. As against Collier and Hoeffler, Keen (2000) does not attribute conflict to be driven more by greed than by grievance. For him, he stresses how the two forces interact so that greed generates grievances and rebellion, which in turn legitimises further greed.

However, the critics of Collier's greed and grievance claimed that Collier has based these findings upon narrowly defined quantitative measures, three defined indices of greed and four indices of grievance. Roland (2011) faulted Collier for consciously omitted indices which he found difficult to measure, such as suppliers of armaments and opportunities for bureaucratic corruption. He claimed further that Collier unconsciously omitted some other factors, including governance, management mechanisms for natural resources and the influence that charismatic leadership can have on rebel groups. These omissions were viewed as the major flaw in greed and grievance model. Stewart (2002) in her article stresses the need to focus on the grievances of the populations since too much focus on inequality between individuals is dangerous for successful development. By using nine case studies she proves how horizontal inequalities have led to violent conflict.

Thus, this article leans on the baseline argument of the greed model, that is economic deprivation and/or vertical inequality are the causes of conflicts. This is evident as this article investigates the relationship between conflict and poverty in

Africa. The direction of causality in the poverty–conflict relationship has been under contention in the literature. Poverty and conflict are widely understood to be closely interconnected; with poverty making countries more prone to civil war, and armed conflict weakening governance and economic performance, thus increasing the risk of conflict relapse (Goodhand, 2001). Some studies have found macro-level factors that made countries more prone to violent conflicts. For instance, low per capita income and large populations correlate with civil war, whereas ethnic and religious diversity does not make countries more prone to conflict (Fearon & Laitin, 2003). On the other hand, poverty can lower resilience to conflict by weakening government institutions, stripping capacity for public goods provision, and limiting the projection of power and authority, whether soft or coercive. Poverty also compounds vulnerability to insurgency at the individual and community level by lowering the opportunity cost of mobilising for violence. High rates of unemployment and inequality, combined with low levels of education and development, are thought to soften the ground for recruitment and provide motives to fight (Humphreys & Weinstein, 2008).

Also, the consequences of violent conflict are profound and far-reaching, they extend beyond direct battlefield causalities. Conflict at once is both a consequence of lacking development and a cause of it. In the work of Gates, Hegre Nygard, and Strand (2010), they found that the economic consequences of conflict (as measured across MDGs) are more severe in the MENA region than among the OECD countries, but less severe than in areas such as Sub-Saharan Africa or South Asia. They also claimed that conflict reduces the efficiency of the public health resources, it decreases life expectancy, increases infant mortality and the destruction of human and physical resources. These lead to low productivity and hence poverty. However, Justino (2012) claimed that the outbreak and impact of war are known to depend on several financial and political factors, the onset, duration and magnitude of the impact of civil wars are also closely related to what happens to people during violent conflicts and to what people do in areas of violence to secure livelihoods, economic survival, physical security and their social networks.

Also, Justino (2011) is of the view that the level of household participation at the start and during the conflict is a function of two interdependent variables, namely household vulnerability to poverty and household vulnerability to violence. That is, the poorer a household is at the start of the conflict, the higher the probability of household participating and supporting an armed group. This is evident in the Boko Haram crisis in the North-east of Nigeria when the residence of the region was alleged to have been harbouring this insurgent group at the inception of the crisis. Thus, this provided a pool of foot soldiers available for recruitment for the insurgent group. Secondly, the higher the risk of violence, the higher is the probability of the household participating and supporting armed groups.

The civil war was identified as one of the main reason for the persistence of poverty in many regions of the world (Collier, 2007): war damages physical infrastructure, institutions and production, destroys assets, breaks up communities and networks and kills and injures people. For instance, during violent conflicts assets get lost or destroyed through fighting and looting. These include houses, land, labour, utensils, cattle, livestock, and other productive assets (Bruck, 2001;

Bundervoet & Verwimp, 2005; Gonzalez & Lopez, 2007; Shemyakina, 2006; Verpoorten, 2009). The destruction of productive assets impedes individuals and household access to important sources of livelihood, which in turn erode the productive capacity of the people. Those that face sudden losses of land, houses, cattle and other assets will be left without means of earning a living or providing food and shelter for their members. Such losses will impact significantly on the ability of affected households to recover their economic and social position in post-conflict settings (Justino & Verwimp, 2006; Verpoorten, 2009).

Furthermore, violent conflicts and wars result in deaths, injuries, disabilities and psychological trauma of people. These consequences of violence may often be enough to push previously vulnerable households below critical wealth, which may well become insurmountable if the household is unable to replace labour or capital (Beegle, 2005; Berlage, Verpoorten, & Verwimp, 2003; Brück & Schindler, 2007; Justino & Verwimp, 2006; Verwimp & Bundervoet, 2008), and may last across generations if education and health outcomes of children are significant. Some empirical evidence has also shown that civil wars result in largely negative and long-lasting nutritional effects amongst children in war zones. Bundervoet and Verwimp (2005) show that children affected by the recent civil war in Burundi had a height-for-age of one standard deviation lower than children not affected by the war. Alderman, Hoddinott, and Kinsey (2006) use panel household survey data collected in 1983–1984, 1987 and yearly from 1992 to 2001 to show the impact of the Zimbabwe civil war in the 1970s, which was followed by severe droughts in 1982–1983 and 1983–1984. The authors find that in 2001, on average, children in the sample affected by the shocks would have been 3.4 cm taller had the war and adverse weather conditions not taken place.

In summary, the body of literature has shown a diverse view of the conflict–poverty relationship. In Africa however, political corruption has been argued to stand out as the most persuasive, compelling and primary explanation for the causal relationship(s) between poverty, conflict, and development, though, it is not an exclusive one (Ikejiaku, 2009). Some other works that have demonstrated the relationship between conflict and poverty in Africa found direct and indirect links (Draman, 2003; Ikejiaku, 2012).

The Data and Econometric Methodology

The data used in this study comprise of 45 selected African countries over a period 1980–2015. This article sources data on the conflict from the Major Episodes of Political Violence (MEPV), 1946–2015, from the Centre for Systemic Peace database. INTCF represents international/interstate conflict; this is, the sum of the magnitude score of the episode(s) of international violence (INTVIOL) and magnitude score of the episode(s) of international warfare (INTWAR). CIVCF represents civil conflict; that is, the sum of magnitude score of the episode(s) of civil violence CIVVOL, magnitude score of the episode(s) of civil warfare (CIVWAR), magnitude score of the episode(s) of ethnic violence (ETHVIOL) and magnitude score of the episode(s) of ethnic warfare (ETHWAR). The scale used for all the

variables ranges from 0 (lowest) to 10 (highest). The higher the magnitude score the higher the intensity of the conflict. Also, political regime type (POLT) was sourced from the Polity IV Project of Marshall and Jaggers, Center for Systemic Peace. The unified polity scale values used ranges from +10 (strongly democratic to −10 (strongly autocratic), implies that an increase in POLREG tends towards democracy while a decrease tends towards autocracy.

This article sources data on GDP growth (GDPG), GDP per capita(GDPPC), Agriculture value added per worker(AGVPW), household final consumption expenditure per capita (COMPC), Life expectancy at birth, General government final consumption expenditure (annual % growth) (GEG), population growth (POPG) from the World Bank Development indicator in the World Bank database. The article computes the POV from indicators such as GDPPC, AGVPW, LEXP, and COMPC, using principal component analysis (PCA).

Econometric Methodology

~~The PCA was used to compute the POV.~~ PCA is a multivariate statistical method that is used in reducing the number of variables without losing too much informa-tion. PCA is proficient in generating fewer numbers of variables that explain most of the variation in the original variables. This article uses PCA to reduce poverty indicators such as GDP per capita (GDPPC), Agriculture value added per worker (AGVPW), Life expectancy at birth and household final consumption expendi-ture per capita (COMPC) to form a single index named POV.

This article also uses Granger causality method to test the direction of causality between the poverty indicators and index and the conflict. Granger (1969) pro-posed a time-series data-based approach to determine causality. Granger causal-ity, whether computed in the time domain or the frequency domain, assumes linear interaction by the autoregressive model structure. In the Granger-sense x is a cause of y if it is useful in forecasting y.[16] In this framework 'useful' means that x can increase the accuracy of the prediction of y concerning a forecast, consider-ing only past values of y.

This article uses the first-differenced GMM approach to investigate the rela-tionship between conflict and poverty in Africa. For simplicity, consider and AR (1) model with unobserved-specific effects:

$$y_{it} = \alpha\, y_{i,t} + \eta_i + \mu_{it} |\alpha| < 1 \qquad (1)$$

For $i = 1, \ldots, N$ and $t = 2, \ldots, T$, where $\eta_i + \mu_{it} = v_{it}$ has the standard error com-petent structure

$$E[\eta]_i = 0,\ E[\mu_{it}] = 0,\ E[\mu_{it}\eta_i] = 0 \text{ for } I = 1, \ldots, N \text{ and } t = 2, \ldots, T \qquad (2)$$

However, this first-differenced GMM estimator has been found to have poor finite proprieties, in terms of bias and impression, in one important case. This occurs when the lagged levels of the series are only weakly correlated with subsequent

first-differences so that the instruments available for the first-differenced equations are weak (Blundell & Bond 1998). In the AR (1) model of equation (1), this occurs either as the autoregressive parameter (α) approaches unity, or as the variance of the individual effects (η_i) increases relative to the variance of the transient shocks (μ_{it}). Simulation results reported in Blundell and Bond (1998) show that the first-differenced GMM estimator may be subject to a large downward finite-sample bias in these cases, particularly when the number of periods available is small.

Given the weaknesses of the first-differenced GMM, we considered one estimator that may have superior finite sample properties. To obtain a linear GMM estimator better suited to estimating autoregressive models with persistent panel data, Blundell and Bond (1998) consider the additional assumption that

$$E\left(\eta_i \Delta y_{i2}\right) = 0, \text{ for } i = 1, \cdots, N. \tag{3}$$

This assumption requires a stationarity restriction on the initial conditions y_{i1} (Bond, Hoeffler, & Temple, 2001). Condition (8) holds if the means of the y it series, whilst differing across individuals, are constant through time for periods 1, 2, …, T for each individual.[17]

The system GMM estimator combines the standard set of equations in first-differences with suitably lagged first-differences as instruments, with an additional set of equations in levels with suitably lagged first-differences as instruments. As an empirical matter, the validity of these additional instruments can be tested using standard Sargan tests of over-identifying restrictions or using Difference Sargan or Hausman comparisons between the first-differenced GMM and system GMM results (Arellano & Bond, 1991). One other reason for using the system GMM estimator is that it is asymptotically efficient relative to the first-differenced GMM.

The empirical model for poverty rate can be summarised as follows:

$$Pov_{it} = \alpha Pov_{i,t-i} + X'_{i,t}\beta_1 + W'_{i,t}\beta_2 + \eta_i + \mu_{it} \quad i = 1, \cdots, N \, t = 1, \cdots, T_i \tag{4}$$

where *Pov* stands for POV and other poverty indicators of country i at time t, α, is a parameter to be estimated, β_1 and β_2 are vectors of parameters to be estimated, X is a vector of strictly exogenous covariates, W is a vector of endogenous covariates, η are country-specific effects, and μ is the error term.

Due to the complications that could arise in the estimation of this model using OLS, we estimated the first-differenced and system GMM for robustness. In both the fixed and random effects settings, the difficulty is that the lagged dependent variable is correlated with the error term, even if we assume that the disturbances are not themselves autocorrelated.

Empirical Analysis

[AQ4]   Aside the principal component analysis and the unit root test[18] conducted to generate the POV, the first empirical exercise considered in investigating the conflict–poverty

relationship in Africa is the causality test between conflict and POV and indicators. ~~Using the Granger causality test, the result present in Table 1~~ shows that there exists uni-directional causality between conflict and poverty such that, conflict granger-cause poverty in Africa and not the other way round. This is consistent with some findings in the literature such as (Addison et al., 2010; ACAPS and MapAction, 2013; Baddeley, 2011; Justino, 2010; Justino & Verwimp, 2013; McGillivray & Noorbakhsh, 2004; USAID, 2014). These studies have found that violent conflict could lead to poverty by causing: damage to infrastructure, institutions and production; the destruction of assets; the breakup of communities and social networks; forced displacement; increased unemployment and inflation; changes in access to and relationship with local exchange, employment, reducing human development, credit and insurance markets; fall in spending on social services; and death and injury to people.

Uni-directional causality also exists between civil conflict and agricultural value-added per worker (AGVPW); civil conflict and consumption per capita (COMPC); civil conflict and GDP per capita (GDPPC). These results imply that civil conflict granger-cause AGVPW, COMPC and GDPPC and not the other way round. However, there is bi-directional causality between internal conflict and life expectancy, such that, internal conflict granger-cause life expectancy, likewise life expectancy granger-cause internal conflict. This is also replicated in the case of international/interstate conflict, as there exists bi-directional causality between interstate conflict and life expectancy.

There exists no causal relationship between interstate conflict and POV, as well as other poverty indicators. As seen in Figure 1b, there is no causal relationship between interstate conflict and poverty in Africa.

Poverty–Conflict Relationship in Africa

After discovering that the causal relationship between conflict and poverty in Africa run from conflict to poverty, except in the case of life expectancy, we test the effect of conflict on poverty. We estimated five models in this article using the GMM method. Model A, B, C, and D represents the four poverty indicators used in computing the POV, and model E represents the POV. We report the estimation results of the models' A–E using the Differenced-GMM and system-GMM for linear dynamic panel data models. Logged variables include; AGVPW, GDPPC and COMPC, such that, each estimated coefficient of model A, B, and C, indicates the percentage change in the AGVPW, GDPPC and COMPC that results from a unit change in the respective explanatory variable. The same set of the explanatory variable is used for each model. For model D and E, each estimated coefficient indicates the percentage change in the explained variable that results from a unit change in the respective explanatory variable.

Tables 3 and 4 reports the effect of violent conflict on poverty; Table 3 reports the differenced and system GMM, Table 4 reports the pool OLS, fixed and random effects, which show the POV and the poverty indicators as determined by internal and interstate conflicts, GDP growth, government expenditure growth,

Table 3. Regression Results on the Disaggregated Effect of Conflict on Poverty in Africa

Variable	Model A (AGVPW)		Model B (COMPC)		Model C (GDPPC)		Model D (LEXP)		Model E (POV)	
	Diff. GMM	System GMM	Diff. GMM	System GMM	Diff. GMM	System GMM	Diff. GMM	System GMM	Diff. GMM	System GMM
Lag of Dependent Variables	0.861***	0.861***	0.902***	0.906***	−0.979***	−0.99***	1.003***	1.018***	0.885***	0.907***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CIVCF	−0.017***	−0.012***	−0.005***	−0.01***	0.006***	−0.013***	0.088***	0.033***	−0.100***	−0.014***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTCF	0.011	−0.007	0.011***	0.018***	0.002	0.003	−0.381**	−0.95***	0.155***	0.084***
	(0.584)	(0.508)	(0.003)	(0.000)	(0.490)	(0.229)	(0.011)	(0.000)	(0.000)	(0.000)
GDPG	0.007***	0.006***	0.003***	0.003***	0.008***	0.008***	0.016***	0.018***	0.019***	0.019***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	.(0.000)	(0.000)	(0.000)
GEG	−0.0001	−0.00002	0.0001***	0.00004***	−0.000004	0.000002	0.003***	0.001***	−0.000002	−0.0002***
	(0.237)	(0.715)	(0.000)	(0.007)	(0.361)	(0.914)	(0.000)	(0.001)	(0.582)	(0.000)
POLT	0.002	0.002***	0.003***	−0.0004	0.005***	0.002***	−0.01***	−0.04***	0.0009	0.0004
	(0.114)	(0.000)	(0.000)	(0.111)	(0.000)	(0.000)	(0.000)	(0.000)	(0.766)	(0.329)
POPG	−0.029***	−0.02***	0.0001	−0.012***	−0.003***	0.002***	0.082***	0.011*	−0.060***	−0.057***
	(0.000)	(0.000)	(0.669)	(0.000)	(0.000)	(0.000)	(0.000)	(0.077)	(0.000)	(0.000)
J Statistics	36.03	43.04	39.75	48.48	31.16	35.79	40.22	29.31	45.11	46.98
Instrument Rank	46	47	46	47	48	45	45	47	47	47
Cross Sections Included	45	45	45	45	45	45	45	45	45	45
Total Observation	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530
Sargan Test (p-value)	0.649	0.383	0.482	0.197	0.89	0.617	0.416	0.934	0.304	0.241

AR (1)	−3.57	−2.35	−2.202	−2.316	−2.800
	(0.000)	(0.019)	(0.016)	(0.021)	(0.005)
AR (2)	−1.31	−0.325	−0.933	−0.116	0.656
	(0.190)	(0.745)	(0.351)	(0.908)	(0.512)

Notes: Only AGVPW, COMPC and GDPPC are in logs. The p-values for the difference and system GMM estimates are in brackets. ***, ** and * denote the significance of the individual coefficients at 1%, 5% and 10% levels, respectively. The Sargan tests are for the over-identifying restrictions is presented. AR (1) and AR (2) are the test statistics and their associated p-values for the null of first and second-order autocorrelation is the first-differenced residuals, respectively. The instrument used is lagged of all independent variables.

Table 4. Regression Results on the Disaggregated Effect of Conflict on Poverty in Africa

Variable	Model A (AGVPW)		Model B (COMPC)		Model C (GDPPC)		Model D (LEXP)		Model E (POV)	
	P-OLS	F-Effect	P-OLS	R-Effect	P-OLS	R-Effect	P-OLS	F-Effect	P-OLS	R-Effect
CIVCF	-0.043***	0.018**	-0.088***	-0.077***	-0.176***	-0.076***	-1.350***	-0.628***	-0.043**	-0.051***
	(0.008)	(0.033)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.019)	(0.000)
INTCF	-0.220***	-0.074**	0.125*	0.007	-0.260***	-0.074**	-1.362***	-1.641***	0.254***	0.008
	(0.007)	(0.033)	(0.095)	(0.875)	(0.003)	(0.035)	(0.000)	(0.000)	(0.005)	(0.856)
GDPG	0.015***	0.002	0.009***	0.001	0.015***	0.002*	0.119***	0.052***	0.009***	-0.003
	(0.000)	(0.114)	(0.001)	(0.413)	(0.000)	(0.068)	(0.000)	(0.000)	(0.006)	(0.153)
GEG	-0.0005	-0.0002	-0.0001	0.00004	-0.001	-0.0002	-0.005	0.002	-0.0004	0.0002
	(0.453)	(0.402)	(0.825)	(0.889)	(0.481)	(0.359)	(0.336)	(0.507)	(0.579)	(0.683)
POLT	-0.007	0.023***	0.006	-0.012***	-0.002	0.008***	0.289***	0.325***	-0.001	-0.008*
	(0.000)	(0.000)	(0.173)	(0.002)	(0.746)	(0.007)	(0.000)	(0.000)	(0.799)	(0.072)
POPG	-0.215***	-0.043***	-0.208***	-0.079***	-0.258***	-0.058***	-1.434***	1.035***	-0.210***	-0.063***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
C	7.316***	'7.005***	7.230***	6.849***	7.592***	7.103***	60.2***	53.79***	0.523***	0.166***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hausman		18.59		8.093		16.461		29.334		10.011
		(0.005)		(0.231)		(0.112)		(0.000)		(0.124)
Adjusted R2	0.069	0.846	0.077	0.047	0.124	0.876	0.125	0.725	0.045	0.016
F-Statistics	20.94	178.8	23.55	14.19	39.18	230.57	39.38	86.37	13.62	5.293
Observation	1620	1620	1620	1620	1620	1620	1620	1620	1620	1620

Source: Author's Computation.
Notes: Only AGVPW, COMPC, and GDPPC are in logs. The p-values for the Pool OLS and Fixed/Random Effects are in brackets. ***, ** and * denote the significance of the individual coefficients at 1%, 5%, and 10% levels, respectively. The chi-square and p-values for Hausman Tests for model specification are presented. The instrument used is lagged of all independent variables.

political regime type, population growth and the lag of the dependent variables. From Table 3, the coefficients of the lagged dependent variable are positive in all the models, and are statistically significant, except for that of the GDP per capita. This negative coefficient of the initial GDP per capita variable implies that the conditional convergence hypothesis is valid for the studied sample. It means that holding other growth determinants constant, countries with lower GDP per capita tend to grow faster.

Internal conflict harms POV and poverty indicators except for life expectancy where internal conflict shows a positive effect. The coefficient of internal conflict (CIVCF) is significant at 1 per cent level of significance in all the models of the difference and system GMM. This result is also replicated in the pool OLS and the fixed/random effect estimations, except in the fixed effect results in Table 4 column 3 where CIVCF holds a positive effect. By implications, a unit change in POV and life expectancy is determined by a unit change in internal/civil conflict, while a percentage change in AGVPW, COMPC, and GDPPC is determined by a unit change in internal conflict. This result reinforces the result of the causality test that internal conflict granger causes POV and its indicators. This result corroborates empirical findings in the works of Addison, et al., 2010; Baddeley, 2011; Justino, 2010; Kugler, Kang, Kugler, Arbetman-Rabinowitz, and Thomas, 2013; USAID (2014); World Bank Report, 2011. By our findings, internal conflicts in Africa reduces agricultural value-added per worker, consumption per capita, GDP per capita, life expectancy as well as POV. A reduction in all these poverty indicators, as well as the POV, tend towards poverty and a lower standard of living. This implies that internal conflicts in Africa lead to a higher poverty rate.

However, Table 3 of the GMM estimations shows that interstate conflict has a statistically significant effect only on households consumption per capita, life expectancy and POV. While the causality test in Table 2b shows there is no causal relationship between interstate conflict and POV or consumption per capita, it shows a bi-directional causal relationship between interstate conflict and life expectancy, reinforcing the result in our GMM estimation. Furthermore, in the pool OLS and fixed/random effect(s) estimation result in Table 4, international conflict has a statistically significant but negative effect on life expectancy. Here, we could say that interstate conflict harms life expectancy, while we could not make a valid claim on its effect on POV and other indicators as there are varying outcomes in the estimations. This is consistent with empirical findings of Feyzabadi, Yazdi, Haghdoost, Mehrolhassani, and Aminian, 2015; Li and Wen, 2005. Violent conflict harms life expectancy as it leads to the destruction of basic health infrastructure, death of health workers, death of people during conflicts and lower quality of living. This result is not farfetched in Africa. The continent has experienced several interstate conflicts which destroyed lives and properties. For instance, the interstate war between Ethiopia and Eritrea claimed hundreds of lives.

GDP growth has a positive and statistically significant effect on all the models. This implies that an increase in GDP tends to increase agricultural value-added per worker, consumption per capita, GDP per capita, life expectancy and POV. Since an increase in all the poverty indicators tends to be a better standard of living and lead out of poverty, an increase in the POV reduces poverty and increases

the standard of living. In this view, GDP growth increases POV which implies a reduction in the poverty rate in Africa. This outcome is reinforced by the pool OLS and Fixed/Random effect(s) regression results.[19] Government expenditure growth has varying results in the models. The result in Table 3 shows that government expenditure growth shows a statistically significant positive effect on consumption per capita and life expectancy. The system GMM estimation result shows that government expenditure growth harms the POV. This cannot be substantiated as government expenditure growth has no statistically significant effect in the pool OLS and fixed/random effect(s) in Table 4. This is consistent with the finding of Dao (2012). We can infer from this result that government expenditure growth increases consumption per capita and life expectancy. Thus, an increase in government expenditure increases consumption per capita and life expectancy in Africa.

The result in Table 3 also shows the population has a statistically significant result in most of the models. The population is a major variable determining most of the per capita variable. It serves as the denominator in the computation of agricultural value-added per worker, per capita consumption and per capita GDP. Political regime types also have statistically significant effects in most of all the models, except model E. However, it comes in varying signs; for instance, the coefficient of POLT in model D shows a negative sign while it is positive for AGVPW, COMPC, and GDPPC, in model A, B, and C.

Furthermore, in each of the panel regression, we conduct tests for the validity of instruments and the presence of second-order serial correlation in the first-differenced residuals. The Sagan test results in Table 3 support the validity of instruments for all the models used. Also, the serial correlation test results show no evidence of second-order serial correlation in the first-differenced residuals.

[AQ5] Conclusion

> 'War does not determine who is right—only who is left'.
>
> —Bertrand Russell.[20]

There is no doubt that conflict is inevitable in human existence. Thus, it must be properly managed to minimise its impacts on our society. The impact of conflict cuts across all sphere of our lives, including the economy. Conflict is argued to have a link with various socio-economic indicators like poverty and standard of living of people. The conflict–poverty relationship has been a contentious issue in the literature. ~~We investigated~~ the conflict–poverty relationship in Africa taking into consideration the two major dimensions of the conflict. ~~We found~~ that internal conflict granger causes poverty in Africa and not the other way round as suggested by some studies. However, there is a bi-causal relationship between conflict and life expectancy in Africa. On the other hand, life expectancy and interstate conflict have a bi-causal relationship in Africa. This suggests that there could be other causes of conflict in Africa which could be political, sociological or even economic, but not necessarily poverty.

We also found that internal/civil conflict harms agricultural value-added per worker, consumption per capita, per capita GDP, life expectancy and POV. That is, a higher incidence of conflict in Africa leads to a reduction in the POV and its indicators. This by implication increases poverty and worsens the standard of living of the people. This suggests that conflict is one of the major causes of poverty in Africa; various governments of African countries should put in place sustainable peacemaking and peacebuilding mechanism to minimise incidences of conflict in the region. Other likely causes of conflict; political, structural and sociological, should be addressed for African countries to meet the sustainable development goal of poverty eradication. Further research should investigate other likely causes of conflict in Africa.

Declaration of Conflicting Interests

Funding

Appendix A

Table A1. Unit Root Test Results

[AQ10]

	Levin et al.				Im et al.			
Variables	Without trend	rmk	With trend	rmk	Without trend	rmk	With trend	rmk
Pov	−17.638***	I(1)	−42.609***	I(0)	−38.649***	I(1)	−19.210***	I(0)
	(0.000)		(0.000)		(0.000)		(0.000)	
Civcf	−1.346*	I(0)	−3.340***	I(0)	−4.132***	I(0)	−3.602***	I(0)
	(0.089)		(0.000)		(0.000)		(0.000)	
Intcf	−4.123***	I(1)	−3.611***	I(0)	−5.328***	I(0)	−3.929***	I(0)
	(0.000)		(0.000)		(0.000)		(0.000)	
GDPg	−23.938***	I(0)	−24.619***	I(0)	−25.532***	I(0)	−26.428***	I(0)
	(0.000)		(0.000)		(0.000)		(0.000)	
Geg	−22.245***	I(0)	−20.465***	I(0)	−21.776***	I(0)	−20.522***	I(0)
	(0.000)		(0.000)		(0.000)		(0.000)	
Polt	−1.846**	I(0)	−1.759**	I(0)	−21.872***	I(1)	−2.156**	I(0)
	(0.033)		(0.039)		(0.000)		(0.016)	
POPg	−9.767***	I(1)	−6.833***	I(0)	−6.848***	I(0)	−6.714***	I(0)
	(0.000)		(0.000)		(0.000)		(0.000)	
AGVPW	−43.733***	I(0)	−47.005***	I(0)	−10.742***	I(0)	−17.091***	I(0)
	(0.000)		(0.000)		(0.000)		(0.000)	

(Table A1 continued)

(Table A1 continued)

	Levin et al.				Im et al.			
Variables	Without trend	rmk	With trend	rmk	Without trend	rmk	With trend	rmk
COMPC	−119.936***	I(0)	−116.515***	I(0)	−16.828***	I(0)	−24.882***	I(0)
	(0.000)		(0.000)		(0.000)		(0.000)	
GDPPC	−44.800***	I(1)	−10.852***	I(0)	−21.503***	I(0)	−3.667***	I(0)
	(0.000)		(0.000)		(0.000)		(0.000)	
LEXP	−23.941***	I(0)	−77.305***	I(0)	−26.446***	I(0)	−79.479***	I(0)
	(0.000)		(0.000)		(0.000)		(0.000)	

[AQ11] **Note:** All the variables are in log form. ***, ** and * denote the significance of the individual coefficients at 1%, 5%, and 10% levels, respectively.

Appendix B

Table B1. List of the African Countries Selected for the Estimation

Algeria	Comoros	Guinea-Bissau	Mali	Sierra Leone
Benin	Egypt	Guinea	Morocco	Swaziland
Botswana	Congo, Rep	Kenya	Mozambique	Tanzania
Burkina Faso	Cote d'Ivoire	Liberia	Namibia	Togo
Burundi	Equatorial Guinea	Lesotho	Nigeria	Tunisia
Cameroon	Ethiopia	Mauritania	Niger	Uganda
Cape Verde	Gabon	Madagascar	Rwanda	Congo DRC
Central African. Rep	Gambia	Mauritius	South Africa	Zambia
Chad	Ghana	Malawi	Senegal	Zimbabwe

Notes

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16. This idea is consistent with the notion that the cause precedes the effects but cannot be applied to the contemporaneous values of x and y.

17. See Blundell and Bond (1998); Bond et al., 2001, for details on first-differenced GMM and system GMM.

18. See Table A1 in the appendix for the result of the unit root test.

19. See Table 4 for details.

20. Citing from Mac Ginty (2006).

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