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The Role of Lifelong Learning in Political Stability and Non-violence: Evidence from Africa

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WP/14/029

**The Role of Lifelong Learning in Political Stability and Non-violence:
Evidence from Africa**

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Research Department

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Evidence from Africa**

Abstract

Purpose – Education as a weapon in the fight against conflict and violence remains widely debated in policy and academic circles. Against the background of growing political instability in Africa and the central role of the knowledge economy in 21st century development, this paper provides three contributions to existing literature. It assesses how political stability/ non-violence is linked to the incremental, synergy and lifelong learning effects of education.

Design/methodology/approach – We define lifelong learning as the combined knowledge acquired during primary, secondary and tertiary education. Principal component analysis is used to reduce the dimensions of educational and political indicators. An endogeneity robust dynamic system Generalized Methods of Moments is used for the estimations.

Findings – We establish three main findings. *First*, education is a useful weapon in the fight against political instability. *Second*, there is an incremental effect of education in the transition from secondary to tertiary schools. *Third*, lifelong learning also has positive and synergy effects. This means that the impact of lifelong learning is higher than the combined independent effects of various educational levels. The empirical evidence is based on 53 African countries for the period 1996-2010.

Practical implications – A plethora of policy implications are discussed, inter alia: how the drive towards increasing the knowledge economy through lifelong learning can be an effective tool in the fight against violence and political insurgency in Africa.

Originality/value – As the continent is nursing knowledge economy ambitions, the paper is original in investigating the determinants of political stability/non violence from three dimensions of education attainment: the incremental, the lifelong learning and a synergy effect.

JEL Classification: I20; I28; K42; O10; O55

Keywords: Lifelong learning; Stability; Development; Africa

1. Introduction

The Arab Spring is being prolonged as many of the countries involved are now only seeing small reflections of light at the end of the tunnel. *First*, the conception and definition of democracy has been revised several times in Egypt as investor confidence erodes and the country faces economic challenges of critical dimensions. *Second*, the democratic transition in Tunisia has not yet produced the desired results because political assassinations and incidences of social disorder are substantially curtailing economic activity. *Third*, the lawlessness in the post-Gaddafi era of Libya has intensified because the rebels are neither willing to disarm nor ready to succumb to the authority of the central government. *Fourth*, after the protracted ousting of President Ali Abdullah Saleh, Yemen is failing in its socio-political contract because the transition is being hampered by daunting economic challenges and regional insurgencies and last but not the least, Syria's situation is one of humanitarian catastrophe because neither side of the conflict is winning nor willing to go to the negotiating table without preconditions (Asongu and Nwachukwu, 2014).

In sub-Saharan Africa, the situation of the 54th and newest republic in the world (South Sudan) is increasingly dominated by rebels seizing oil fields and engaging in random murder. The situation is no better for neighbouring states which have been plagued by political unrest and civil strife in recent decades. For example, the Central African Republic has been confronted with a serious political impasse based along religious lines. Chad (2005-2010), Angola (1975-2002), the Central African Republic (the ripples of aborted coup d'états that occurred between 1996-2003 and the Bush War of 2004-2007), Burundi (1993-2005), Congo Democratic Republic, Sierra Leone (1991-2002), Liberia (1999-2003), Somalia, Sudan and Côte d'Ivoire (a rekindled crisis in 2011 after the 2002-2007 civil war and the 1999 coup d'état) have all shown instances of such impasses. This is not to mention, among others: Zimbabwe's politico-economic meltdown, the Kenyan post-election violence of 2007/2008 and the increasingly determined Boko Haram

insurgency in Nigeria. Besides, the brutal and lengthy civil wars in Chad, Somalia, Angola, Liberia, and Sierra Leone which have been very costly to African development; the carnage in the Democratic Republic of Congo and the genocide in Darfur-Sudan were registered as the world's highest war casualties since World War II in their time. In a nutshell, seven out of nine recent cases of total societal chaos and breakdown into anarchy in the world have occurred in Africa. Accordingly, with the exceptions of Afghanistan and Syria, we have Burundi, Angola, Liberia, Rwanda, Somalia, Sierra Leone, Congo and Sudan as the most harmful in the world.

In the light of above stylized facts, greater political stability and the absence of violence are of considerable policy relevance. As the world is driving towards the knowledge economies (KE) that have become indispensable for prosperity in the 21st century, it is interesting to assess how this paradigm shift might affect conflicts and political stability in the African Continent. KE and political stability are key components of African development. But unfortunately, along with the stylized facts on political strife in the first-two paragraphs here, the knowledge index of the Continent (which dropped between 2000 and 2009) has become considerably lower relative to other regions of the world (Anyanwu, 2009; Tchamyu, 2014). As far as we know the current extant of KE literature has not attempted to tackle the connection between lifelong learning and political stability/non-violence. The main issues considered by this KE literature have been, among other things: general opinions of KE (Lin, 2006; Makinda, 2007; Rooney, 2005; Aubert, 2005), KE in space transformation (Moodley, 2003; Maswera et al., 2008), spatiality in the production of knowledge (Bidwell et al., 2011; Neimark, 2012), economic incentives and institutional regimes (Letiche, 2006; Cogburn, 2003; Saxegaard, 2006; Andrés and Asongu, 2013a; Nguena and Tsafack, 2014), education (Kamara *et al.*, 2007; Ford, 2007; Amavilah, 2009; Weber, 2011; Wantchekon *et al.*, 2014), information and communication technologies (Jonathan and Camilo, 2008; Maurer, 2008; Chavula, 2010; Ondiege, 2010; Merritt, 2010; Aker

and Mbiti, 2010; Butcher, 2011; Thacker, and Wright, 2012; Demonbynes and Thegeya, 2012; Penard et al., 2012; Asongu, 2015a, 2013a), intellectual capital and economic development (Wagiciengo & Belal, 2012; Preece, 2013), innovation (Oyelaran-Oyeyinka and Sampath, 2007; Carisle et al., 2013; Oluwatobi et al., 2014), research and development (Sumberg, 2005; German and Stroud, 2007), intellectual property rights (Lor and Britz, 2005; Zerbe, 2005; Myburgh, 2011; Asongu, 2013b, 2015b; Andrés et al., 2014; Andrés and Asongu, 2013ab), KE oriented towards financial development (Asongu, 2013c, 2014a, 2015c), indigenous knowledge systems (Lwoga et al., 2010; Raseroka, 2008) and catch-up in KE in relation to the economics of East Asia (Lucas, 1988, 1993; Bezmen and Depken, 2004; Tchamyu, 2014; Kim et al., 2012; Andrés et al., 2014; Andrés and Asongu, 2013ab; Asongu, 2013e).

The abundant literature on ‘conflict channels’ and ‘mechanisms of revolution’ can be classified into three main strands: channels to conflict, avenues along which resources may fuel conflicts and conflict resolution mechanisms. Humphreys (2005) has presented some interesting literature on the first-two strands. *First*, the process leading to conflicts, especially in natural resource abundant countries, involves greedy rebels and foreign parties, grievances, weak-state and sparse-network systems. *Second*, consistent with their narrative, there are also a plethora of avenues along which natural resources may influence the duration of social disorder, inter alia: military balances, fragmented organizational structures, domestic and international conflict premia. The *third* strand consists mainly of traditional and modern systems of conflict resolution. These scenarios have culminated in a twofold international concern over the urgent need to address political strife and violence in Africa, as well as the debilitating effect of issues on security, peace and development as well as the burgeoning impact of terrorism and organized crime (Gastrow, 2001; UNODC, 2005ab; Moshi, 2007; Asongu and Kodila-Tedika, 2013ab).

Arising from the above literature, this study will make a fourfold contribution. *First*, it deviates from existing models by focusing on education as a channel for conflict resolution. This is based on documented evidence on peace education (e.g., bilingualism helps in conflict resolution [Costa et al., 2008]). *Second*, it assesses if there is an incremental effect of education per se in conflict resolution. This is in response to a growing contradictory literature concerning education and political governance issues. In essence, drawing from exploratory studies (e.g., Heyneman, 2004, 2008b, Heyneman et al., 2007) on the high cost of bad governance structures, one strand supports the positive role of education in good political governance (Heyneman, 2002, 2008a; Beets, 2005; Oreopoulos and Salvanes, 2009), whereas another stream suggests that education fuels bad governance practices like corruption (Kaffenberger, 2012; Mocan, 2008; Truex, 2011). *Third*, the study also investigates whether or not there is a lifelong learning effect in conflict resolution. Interest in the third contribution arises from the growing relevance of KE in 21st century development. In the paper, we measure lifelong learning as the combined knowledge acquired during primary, secondary and tertiary school education. *Fourth*, the first-three contributions are complemented by an investigation of whether or not there is a ‘synergy or interactive effect’ from lifelong learning. Accordingly, this consists of examining if the favorable effect of lifelong learning on political stability and non-violence is higher than the combined independent effect of primary, secondary and tertiary educations. The paper also extends the evolving stream of literature on learning activities (Nyarko, 2013a) and lessons therefrom in achieving economic prosperity (Lee and Kim, 2009; Lee, 2009; Wa Gĩthĩnji and Adesida, 2011; Babatunde, 2012; Fosu, 2013a)¹.

¹Based on past lessons (Fosu, 2010), Fosu (2012, 2013a) has recently documented the literature on strategies and lessons for achieving development success. The strategies are mostly drawn from: East Asia & the Pacific (Lee, 2013; Warr, 2013; Jomo & Wee, 2013; Thoburn, 2013; Khan, 2013); the emerging Asian giants of China & India (Yao, 2013; Singh, 2013; Santos-Paulino, 2013); Latin America & the Caribbean (De Mello, 2013; Solimano, 2013; Pozo et al., 2013; Trejos, 2013; Cardoso, 2013); the Middle East & North Africa (Looney, 2013; Nyarko, 2013b;

Consistent with Akinwale (2010, p. 125), the theoretical underpinnings of the study are deeply rooted in the Thomas-Kilmann's Model of Conflict Management and Black's Social Control Theory. The latter has proposed the circumstances which predict the usage of one of the five ways of social control (avoidance, settlement, self-help, tolerance and negotiation) in the linkages among groups, organizations and individuals. The model of the former elucidates strategic intentions that could be centered on a two-factor matrix (cooperation and assertiveness) which, in collaboration, produced five conflict styles of management (competition, accommodation, avoidance, collaboration and compromise). The narrative of Akinwale is consistent with Volkema and Bergmann (1995), Black (1990), Borg (1992), and Thomas (1992). In addition, education is expected to theoretically improve political governance through the channels of social responsibility, improved social cohesion and compliance to the rule of law (Heyneman, 2002, 2008a; Beets, 2005; Oreopoulos & Salvanes, 2009). However, as we have highlighted above, there is another stream of the literature which sustains that education could be a source of bad governance practices (Kaffenberger, 2012; Mocan, 2008; Truex, 2011).

The rest of the study is organized as follows. Section 2 covers data and methodology. Empirical analysis is discussed in Section 3 and Section 4 provides concluding remarks.

2. Data and Methodology

2.1 Data

We assess a sample of 53 African countries with data for the period 1996-2010 from the African Development Indicators of the World Bank. The choice of this periodicity is constrained by the political stability and/or non-violence indicators which are available only from the year

Bali moune-Lutz, 2013; Drine, 2013) and; sub-Saharan Africa (Subramanian, 2013; Lundahl & Petersson, 2013; Robinson, 2013; Fosu, 2013b; Naudé, 2013).

1996. The data consists of three-year averages presented in non-overlapping intervals (NOI)² to: (1) mitigate short-run or business cycle disturbances, (2) ensure that the basic condition for the Generalized Methods of Moments (GMM) empirical strategy is met ($N > T$) and (3) reduce instrument proliferation or restrict over-identification. The main dependent variable is a measure of political stability/non-violence. This is complemented by political governance (political stability and voice and accountability) for robustness checks. The definition and measurement of political governance used for robustness checks is informed by Andrés et al. (2013). The ‘political governance’ and ‘lifelong learning’ variables are obtained from principal component analysis (PCA) as discussed below (see Sections 2.2.1 and 3.2).

We control for government expenditure, foreign aid, inflation, democracy, trade openness and per capita economic prosperity. While government expenditure is consistent with fiscal behavior in political governance (Eubank, 2012; Asongu and Jellal, 2013), foreign aid has been documented to negatively affect political stability in the African Continent (Eubank, 2012; Asongu, 2012a, 2013f). On inflation and democracy, whereas the former may worsen political governance (especially with soaring prices for basic items such as food), the latter is naturally a positive determinant of good governance. The expected signs of these control variables are broadly in accordance with macroeconomic and institutional characteristics leading to the 2011 Arab Spring (Khandelwal & Roitman, 2012). Globalization in terms of trade openness improves stability of political systems with associated national income (Lalountas et al., 2011; Asongu, 2014b). Income-levels are also instrumental in raising government quality (Asongu, 2012b, p. 191). We also use time-effects to control for unobserved heterogeneity.

The variables are defined in Appendix 1, the summary statistics presented in Appendix 2 and correlation analysis detailed in Appendix 3. From the descriptive statistics, the variables are

² We have five-three year NOI: 1996-1998; 1999-2001; 2002-2004; 2005-2007 & 2008-2010.

comparable and we can be confident that some plausible estimated relationships will emerge from a regression analysis of their variations. Additionally, the use of simple pairwise correlation coefficients helps to mitigate the influence of misspecification error arising from overparameterization and multicollinearity.

2.2 Methodology

2.2.1 Principal Component Analysis (PCA)

Since the phenomenon of lifelong learning is complex and multi-dimensional (Kirby *et al.*, 2010) there is currently no mainstream consensus on the manner in which it should be measured. The difficulty in calibrating this phenomenon is compounded by the fact that it involves a learning process from birth to death. In this paper we define lifelong learning as the formal educational process that entails primary, secondary and tertiary schooling. Hence, it is conceived as the combined knowledge acquired during the three levels of education.

In light of the above narrative and perception, we use the principal component analysis (PCA) to measure this combined knowledge acquired. The PCA is a widely employed statistical technique that is used to reduce a set of highly correlated variables into a set of uncorrelated series that represent a significant proportion of the initial variability or information. The criterion used to decide which information to retain is from Kaiser (1974) and Jolliffe (2002) who have recommended stopping at principal components (PCs) that have an eigenvalue of more than one (greater than the mean). As shown in Table 1 below, the first PC has an eigenvalue of 1.955 and accounts for more than 65% of combined information or variability in the three educational levels. Therefore *Educatex* is the lifelong learning indicator used in this study.

Table 1: Principal Component Analysis for educational index (*Educatex*)

	Component Loadings			Proportion	Cumulative	
	PSE	SSE	TSE		Proportion	Eigen value
First PC	0.443	0.659	0.607	0.651	0.651	1.955
Second PC	0.868	-0.147	-0.474	0.267	0.918	0.801
Third PC	-0.223	0.737	-0.638	0.081	1.000	0.243

PC: Principal Component. PSE: Primary School Enrolment. SSE: Secondary School Enrolment. TSE: Tertiary School Enrolment.

2.2.2 Estimation technique

We adopt a Generalized Methods of Moments (GMM) as the estimation strategy for three main reasons: first, it controls for endogeneity in all the regressors, second, cross-country variations are not eliminated in the process and third, it reduces biases in the difference estimators resulting from small samples. Therefore, it is specifically for this third point that we have acted in accordance with Bond et al. (2001, pp. 3-4) in preferring the system GMM estimation approach (Arellano and Bover, 1995; Blundell & Bond, 1998) to the difference estimator (Arellano & Bond, 1991). The *two-step* procedure is preferred to the *one-step* because it controls for heteroscedasticity. The latter is homoscedasticity consistent. In order to assess the validity of the instruments, we perform two tests, notably the Sargan over-identifying restrictions (OIR) test for instrument validity and the Arellano & Bond autocorrelation (AR [2]) test for the absence of serial correlation in the residuals. As already highlighted in the data section, we also control for the unobserved heterogeneity in terms of time fixed-effects. Moreover, short-run or business cycle disturbances are mitigated with the employment of three-year non-overlapping intervals (NOI). In essence, by employing data averages, we reinforce the primary condition for the use of the GMM technique $N > T$ ($53 > 5$). Hence, we consistently ensure that the instruments are less than the number of cross-sections to restrict over-identification and mitigate instrument proliferation concerns.

We present the GMM equations in level and first difference below:

$$PS_{i,t} = \sigma_0 + \sigma_1 PS_{i,t-1} + \sigma_2 PSE_{i,t} + \sigma_3 SSE_{i,t} + \sigma_4 TSE_{i,t} + \sigma_5 Educatex_{i,t} + \sum_{j=1}^6 \partial_j X_{i,t} + \eta_i + \xi_t + \varepsilon_{i,t} \quad (1)$$

$$PS_{i,t} - PS_{i,t-1} = \sigma_1 (PS_{i,t-1} - PS_{i,t-2}) + \sigma_2 (PSE_{i,t} - PSE_{i,t-1}) + \sigma_3 (SSE_{i,t} - SSE_{i,t-1}) + \sigma_4 (TSE_{i,t} - TSE_{i,t-1}) + \sigma_5 (Educatex_{i,t} - Educatex_{i,t-1}) + \sum_{j=1}^6 \partial_j (X_{i,t} - X_{i,t-1}) + (\xi_t - \xi_{t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \quad (2)$$

Where: 't' represents the period and 'i' stands for a country. *PS* is Political Stability; *PSE*, Primary School Enrolment; *SSE*, Secondary School Enrolment; *TSE*, Tertiary School Enrolment; *Educatex*, lifelong learning; *X* is the set of control variables (*trade openness, foreign aid, government expenditure, inflation, democracy and GDP per capita growth*); η_i is a country-specific effect; ξ_t is a time-specific constant and $\varepsilon_{i,t}$ is an error term. The estimation process consists of jointly estimating the regression in levels (Eq. [1]) with that in first-difference (Eq. [2]), thereby exploiting all the orthogonality or parallel conditions between the lagged endogenous variable and the error term.

3. Empirical Analysis

3.1 Presentation of Results

This section assesses four main issues: (i) the effect of education, *per se*, (ii) the incremental impact of education, (iii) lifelong learning outcomes and (iv) a synergy or interaction effect. The results are presented in Table 2 below. Consistent with the information criteria highlighted above, the models are valid. Accordingly, the null hypotheses of the Sargan OIR and AR (2) tests for the validity of the instruments and absence of autocorrelation respectively are not rejected.

In the light of the concerns under investigation, the following are established. *First*, but for primary school education, the other educational measures significantly positively affect political stability and/or non-violence. The insignificance of primary school enrolment is

consistent with the predictions that the know-how achieved at that low level of education is too basic to exert any substantial influence on the institutional characteristics of a country. *Second*, there is an incremental effect of education on the dependent variable. Accordingly, the ability to participate in a stable political system (and/or engage in non-violent processes) increases in the transition from secondary to tertiary education. *Third*, lifelong learning significantly positively affects the constancy of political arrangements in our sample of African countries. *Fourth*, there is evidence of an educational synergy effect since the coefficient on the lifelong learning variable is higher than the combined independent impacts of primary, secondary and tertiary enrolments.

The significant control variables have the expected signs. Globalization in terms of trade openness and democracy improves the political conditions in the African Continent. Foreign aid may positively influence political outcomes in the short-run by compensating warring factions for the foregone potential gains from engaging in conflicts.

Table 2: The effect of educational dynamics on political stability/non-violence

	Panel A: Effect of Primary and Secondary School Enrolments							
	Effect of Primary School Enrolment				Effect of Secondary School Enrolment			
Political Stability (-1)	0.839*** (0.000)	0.929*** (0.000)	0.946*** (0.000)	0.947*** (0.000)	0.360 (0.162)	0.477 (0.133)	0.673* (0.095)	0.606 (0.175)
Constant	-0.338 (0.365)	-0.274 (0.221)	-0.172 (0.509)	-0.200 (0.454)	-0.972** (0.014)	-0.704 (0.273)	-0.572 (0.331)	-0.649 (0.320)
Primary School Enrolment	0.001 (0.613)	0.001 (0.384)	0.0007 (0.655)	0.0009 (0.594)	---	---	---	---
Secondary School Enrolment	---	---	---	---	0.010*** (0.001)	0.009* (0.063)	0.005** (0.027)	0.005** (0.025)
Trade Openness	0.001 (0.324)	0.0008 (0.426)	0.0005 (0.607)	0.0006 (0.553)	0.003 (0.161)	0.002 (0.539)	0.001 (0.678)	0.002 (0.596)
Foreign Aid	0.005 (0.146)	0.006* (0.054)	0.003 (0.443)	0.004 (0.316)	0.011 (0.124)	0.016 (0.499)	0.010 (0.131)	0.011 (0.170)
Government Expenditure	0.003 (0.540)	0.002 (0.664)	0.003 (0.636)	0.003 (0.555)	-0.003 (0.567)	-0.006 (0.357)	-0.004 (0.549)	-0.004 (0.503)
Inflation	---	-0.0003 (0.485)	-0.0003 (0.671)	-0.0003 (0.626)	---	-0.001* (0.093)	-0.0008 (0.333)	-0.001 (0.265)
Democracy	---	---	0.015 (0.340)	0.015 (0.201)	---	---	0.048 (0.312)	0.054 (0.278)
GDP per capita growth	---	---	---	-0.004 (0.723)	---	---	---	-0.012 (0.431)
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(2)	(0.766)	(0.619)	(0.798)	(0.823)	(0.199)	(0.125)	(0.663)	(0.925)
Sargan OIR	(0.384)	(0.460)	(0.408)	(0.423)	(0.650)	(0.443)	(0.169)	(0.180)
Wald (joint)	262.73*** (0.000)	1981.33*** (0.000)	1272.18*** (0.000)	1389.3*** (0.000)	75.074*** (0.000)	687.94*** (0.000)	578.02*** (0.000)	628.21*** (0.000)
Instruments	17	18	19	20	17	18	19	20
Countries	36	34	32	32	34	32	30	30
Observations	125	117	109	109	110	102	94	94

Panel B: Effects of Tertiary School Enrolment and Lifelong Learning								
	Effect of Tertiary School Enrolment				Effect of Lifelong Learning			
Political Stability (-1)	0.834*** (0.002)	1.052*** (0.000)	0.650 (0.111)	0.629 (0.128)	0.067 (0.878)	0.623*** (0.000)	0.644*** (0.000)	0.651*** (0.001)
Constant	-0.315 (0.137)	-0.153 (0.440)	-0.600* (0.099)	-0.606* (0.087)	-0.650 (0.148)	-0.350** (0.042)	-0.387** (0.006)	-0.372** (0.018)
Tertiary School Enrolment	0.010 (0.136)	0.006 (0.146)	0.014** (0.025)	0.014** (0.026)	---	---	---	---
Life Long Learning (<i>Educatex</i>)	---	---	---	---	0.246** (0.028)	0.124** (0.038)	0.114** (0.036)	0.122** (0.033)
Trade Openness	0.0009 (0.663)	-0.0001 (0.907)	0.003 (0.314)	0.003 (0.295)	0.004 (0.162)	0.002** (0.045)	0.002* (0.059)	0.002* (0.062)
Foreign Aid	0.007 (0.384)	0.005 (0.483)	0.012 (0.147)	0.012 (0.157)	0.021 (0.162)	0.019** (0.037)	0.017* (0.079)	0.018* (0.065)
Government Expenditure	0.004 (0.545)	0.002 (0.596)	0.001 (0.852)	0.0009 (0.866)	-0.0004 (0.946)	-0.0007 (0.928)	-0.0008 (0.903)	-0.0009 (0.887)
Inflation	---	0.004 (0.524)	-0.009 (0.439)	-0.009 (0.431)	---	-0.007 (0.545)	-0.020** (0.033)	-0.020** (0.037)
Democracy	---	---	0.044 (0.215)	0.045 (0.203)	---	---	0.040** (0.022)	0.038** (0.047)
GDP per capita growth	---	---	---	-0.009 (0.622)	---	---	---	-0.013 (0.111)
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(2)	(0.788)	(0.420)	(0.483)	(0.494)	(0.401)	(0.491)	(0.332)	(0.355)
Sargan OIR	(0.238)	(0.215)	(0.136)	(0.149)	(0.797)	(0.601)	(0.369)	(0.440)
Wald (joint)	66.366*** (0.000)	148.06*** (0.000)	79.124*** (0.000)	80.776*** (0.000)	14.491** (0.012)	208.58*** (0.000)	97.432*** (0.000)	163.56*** (0.000)
Instruments	17	18	19	20	18	18	19	20
Countries	30	28	26	26	25	25	23	23
Observations	98	92	86	86	77	77	71	71

***, **, and * indicate significance at 1%, 5% and 10% levels respectively. The dependent variable is the political stability indicator. AR(2) is a Second Order Autocorrelation test. OIR: Overidentifying Restrictions test. The significance of bold values is twofold. (1) The significance of estimated coefficients and the Wald statistics and (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 are in brackets. GDP is Gross Domestic Product.

3. 2 Sensitivity Analysis

For robustness purposes we perform a sensitivity analysis with the political governance indicator as the new dependent variable. Consistent with Kaufmann et al. (2010) as applied by Andrés et al. (2014), political governance constitutes voice and accountability and political stability/non-violence. The intuition for using political governance for robustness purposes is that the absence of voice and accountability is also a cause of conflicts in the African Continent. Political governance is measured as the first PC of the two constituent variables. As shown in Table 3, the criterion used to retain the first PC is consistent with the justifications from Kaiser (1974) and Jolliffe (2002) discussed in Section 2.2.1 for the lifelong learning indicator

(*Educatex*). Hence *Polgov* is the PCA generated political governance indicator used in the robustness test.

Table 3: Principal Component Analysis (PCA) for the Political Governance Index (Polgov)

Principal Components	Component Matrix (Loadings)		Proportion(s)	Cumulative Proportion(s)	Eigen Value(s)
	PS	VA			
First P.C	0.707	0.707	0.829	0.829	1.659
Second P.C	0.707	-0.707	0.170	1.000	0.340

P.C: Principal Component. VA: Voice & Accountability. PS: Political Stability.

Table 4 below is a reflection of Table 2 with the political governance dependent variable. The models are overwhelming valid because the null hypotheses of the Sargan OIR and AR (2) tests are not strongly rejected. The four main concerns underpinning the motivation of the study are assessed. The findings in terms of educational attainment, lifelong learning and control variables are broadly consistent with those in Table 2.

Table 4: The effect educational dynamics on political governance

	Panel A: Effect of Primary and Secondary School Enrolments							
	Effect of Primary School Enrolment				Effect of Secondary School Enrolment			
Political Governance (-1)	1.047*** (0.000)	1.112*** (0.000)	0.751** (0.034)	0.780** (0.035)	0.794*** (0.001)	0.821*** (0.000)	0.803*** (0.000)	0.801*** (0.000)
Constant	-0.363 (0.221)	-0.201 (0.570)	-0.284 (0.489)	-0.297 (0.430)	-0.348 (0.122)	-0.192 (0.285)	-0.364* (0.090)	-0.365* (0.089)
Primary School Enrolment	0.001 (0.525)	0.0003 (0.913)	0.001 (0.610)	0.001 (0.587)	---	---	---	---
Secondary School Enrolment	---	---	---	---	0.007 (0.231)	0.006 (0.112)	0.004* (0.083)	0.004* (0.084)
Trade Openness	0.0004 (0.576)	0.0003 (0.765)	0.001 (0.506)	0.0009 (0.534)	0.0002 (0.883)	-0.0006 (0.657)	0.0004 (0.743)	0.0004 (0.741)
Foreign Aid	0.008*** (0.007)	0.010** (0.015)	0.006* (0.069)	0.006* (0.061)	0.009* (0.078)	0.006 (0.455)	0.013*** (0.000)	0.013*** (0.000)
Government Expenditure	0.005 (0.174)	0.004 (0.259)	0.001 (0.880)	0.001 (0.835)	0.000 (0.994)	-0.004 (0.532)	0.000 (0.997)	0.000 (0.997)
Inflation	---	0.0004 (0.347)	-0.0007 (0.350)	-0.0004 (0.677)	---	-0.001 (0.192)	-0.0002 (0.705)	-0.0002 (0.747)
Democracy	---	---	0.057 (0.438)	0.051 (0.498)	---	---	0.051* (0.086)	0.052* (0.087)
GDP per capita growth	---	---	---	0.011 (0.562)	---	---	---	-0.0003 (0.982)
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(2)	(0.965)	(0.754)	(0.732)	(0.709)	(0.395)	(0.546)	(0.754)	(0.750)
Sargan OIR	(0.405)	(0.475)	(0.546)	(0.522)	(0.269)	(0.402)	(0.345)	(0.345)
Wald (joint)	739.27*** (0.000)	1280.17*** (0.000)	1455.49*** (0.000)	1638.8*** (0.000)	181.62*** (0.000)	661.59*** (0.000)	1342.0*** (0.000)	1526.9*** (0.000)
Instruments	17	18	19	20	17	18	19	20
Countries	36	34	32	32	34	32	30	30
Observations	125	117	109	109	110	102	94	94

Panel B: Effects of Tertiary School Enrolment and Lifelong Learning								
	Effect of Tertiary School Enrolment				Effect of Lifelong Learning			
Political Governance (-1)	0.991*** (0.000)	0.929*** (0.000)	0.543** (0.045)	0.524** (0.033)	0.586*** (0.001)	0.680*** (0.000)	0.607*** (0.000)	0.631*** (0.000)
Constant	-0.223 (0.201)	-0.334 (0.132)	-0.340* (0.074)	-0.350* (0.052)	0.243 (0.328)	0.106 (0.575)	-0.070 (0.613)	-0.052 (0.718)
Tertiary School Enrolment	-0.001 (0.867)	-0.001 (0.900)	0.007 (0.230)	0.007 (0.256)	---	---	---	---
Life Long Learning(<i>Educate</i>)	---	---	---	---	0.071 (0.491)	0.078 (0.299)	0.098** (0.023)	0.098** (0.047)
Trade Openness	0.0003 (0.819)	0.001 (0.486)	0.002** (0.019)	0.002** (0.033)	0.000 (0.967)	0.000 (0.972)	0.001 (0.171)	0.001 (0.215)
Foreign Aid	0.003 (0.478)	0.005 (0.516)	0.011 (0.182)	0.011 (0.141)	-0.0007 (0.961)	0.008 (0.540)	0.014 (0.184)	0.014 (0.236)
Government Expenditure	0.006 (0.244)	0.004 (0.389)	0.001 (0.789)	0.001 (0.831)	-0.007 (0.247)	-0.004 (0.499)	-0.001 (0.635)	-0.001 (0.688)
Inflation	---	0.020** (0.016)	-0.003 (0.793)	-0.003 (0.776)	---	0.005 (0.684)	-0.013 (0.333)	-0.012 (0.442)
Democracy	---	---	0.082* (0.063)	0.084** (0.031)	---	---	0.075** (0.019)	0.071** (0.040)
GDP per capita growth	---	---	---	0.008 (0.708)	---	---	---	-0.012 (0.182)
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(2)	(0.319)	(0.347)	(0.824)	(0.610)	(0.164)	(0.237)	(0.334)	(0.451)
Sargan OIR	(0.303)	(0.543)	(0.489)	(0.517)	(0.915)	(0.710)	(0.630)	(0.658)
Wald (joint)	205.16*** (0.000)	430.84*** (0.000)	364.45*** (0.000)	386.28*** (0.000)	13.726** (0.017)	52.266*** (0.000)	190.07*** (0.000)	310.75*** (0.000)
Instruments	17	18	19	20	17	18	19	20
Countries	30	28	26	26	27	25	23	23
Observations	98	92	86	86	83	77	71	71

***, **, and * indicate significance at 1%, 5% and 10% levels respectively. The dependent variable is the political governance indicator. AR(2): Second Order Autocorrelation test. OIR: Overidentifying Restrictions test. The significance of bold values is twofold. 1) The significance of estimated coefficients and the Wald statistics and(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. GDP is Gross Domestic Product.

4. Further discussion, implications and concluding remarks

The positive effect of education on political stability is broadly in accordance with the theoretical underpinnings discussed above. Indeed, this positive nexus can be attributed among other things to the following educational channels: social responsibility, improved social cohesion and regulatory compliance and better legal structures (Beets, 2005; Heyneman, 2002, 2008a; Oreopoulos and Salvanes, 2009). The positive impact of education on political stability could be traceable to the non-cognitive and cognitive appeals of education. Consistent with this interpretation is the inference that education endows students with the patience to sacrifice the present for more rewarding gains in the future. This may be primarily because they have to work hard in order to get pass grades (Kaffenberger, 2012). Moreover, a student that has sacrificed

many years in studies may have other means of making ends meet than resorting to violence. This explanation is derived from an evaluation of the risks and returns involved in criminal activities.

On the other hand, the findings are inconsistent with the branch of the literature which maintains that education worsens political governance processes (Kaffenberger, 2012; Mocan, 2008; Truex, 2011). However, the element of consolation in this second stream is the recognition that, despite the established doctrine the role of education remains fundamental in improving governance if good policies are to be put in place and appropriately enforced (Truex, 2011).

The results on the incremental impact of schooling is in line with Cheung and Chan (2008) and Lederman *et al.* (2005) who concluded that higher levels of education are associated with improvement in the indicators of political governance. The findings indicate that policy actions to drive-up standards in the formal education sector would enhance the opportunity for building better political governance institutions and a stable government. Two specific implications arise. *First*, with regard to the incremental benefits of educational attainment, guidelines which encourage a smooth transition from primary to tertiary levels would significantly benefit the overall economy through a greater stability in political outcomes. *Second*, with respect to the synergy impact, the drive towards a knowledge economy by means of formal lifelong learning will be beneficial to society mostly in terms of reduced political strife and social unrest.

Improving human capital externalities by means of educational role models could also accelerate the political benefits of lifelong learning. Indeed, recent evidence has shown that such externalities are considerably relevant in Africa's transformation into a knowledge economy (Wantchekon *et al.*, 2014). Hence, policy initiatives to provide educational inducements would be vital in those African countries, such as Burundi, Liberia, Rwanda, Sudan, Sierra Leone, Congo Democratic Republic and Angola, with high risks of political insurrection and civil unrest. Local

or indigenous communities with histories of recurrent tribal wars and conflicts should also be targeted by educational officials. Cooperation for knowledge dissemination at the national and local levels is also highly desirable especially in relation to peace education.

Whereas there is some consensus that the negative impact of a brain drain could be countered with remittances (Ngoma & Ismail, 2013; Osabuohien and Efobi, 2013), Nyarko and Gyimah-Brempong (2011) have concluded that education is the more important tool for social protection in the long-run. We may infer that the educated abroad have some leverage in transferring knowledge to home universities with a consequent impact on the political situation of these home countries. This recommendation concurs with the conclusions of Wantchekon et al. (2014) on human capital externalities from education. Hence, measures which are put in place by governments to encourage the home-coming of their educated nationals could be correlated with an enabling environment for better political governance and social cohesion.

In summary, in order to maximize the benefits of education in conflict management and prevention, two factors are essential. *First*, bold steps are imperative to increase the rates of enrolment and quality of teaching in schools, colleges and universities. The most obvious of these initiatives would appear to be free education at every level if such can be afforded. Then too, free school meals, allowances for school uniform, awards for good teachings and so on should all enhance the impact of education on political stability. The formation of this human capital factor is critical for enhancing the return to money allocated to conflict prevention studies, science and technological development. *Second*, after university graduation, people should be encouraged to continue with further education and training in order to adapt their skills to a changing work environment. Tax reduction to pay for staff development, for example, may be a worthwhile policy action. Indeed, the productivity gains therefrom should positively affect economic output and the employment rate. This last is a critical factor for social cohesion.

In conclusion, we should note that the role of education in the fight against conflict and violence has remained widely debated in policy and academic circles. Against the background of worsening political instability in Africa and the central role of the knowledge economy in 21st century development, this paper has provided three contributions to the existing literature. It has assessed: the incremental, the lifelong learning and the synergy effects of educational attainment. We have defined lifelong learning as the combined knowledge acquired during primary, secondary and tertiary educations. Three findings have been established. *First*, education is an effective weapon in the fight against political insurgency. *Second*, there is an incremental effect of education arising from a smooth transition of pupils from secondary to tertiary schools. *Third*, lifelong learning also has positive and interactive effects, meaning that the incidence of continuing to further education after graduation enhances the combined independent effects of various education levels. The empirical evidence is based on 53 African countries for the period 1996-2010. Policy implications have also been discussed.

Appendices

Appendix 1: Definitions of variables

Variable(s)	Definition(s)	Source(s)
Political Stability/ No violence	Political stability/no violence (estimate): measured as the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional and violent means, including domestic violence and terrorism.	World Bank (WDI)
Voice & Accountability	Voice and Accountability (estimate): Measures the extent to which a country's citizens are able to participate in selecting their government and to enjoy freedom of expression, freedom of association, and a free media.	World Bank (WDI)
Political Governance	First Principal Component of Political Stability and Voice & Accountability	PCA
Primary Schooling (PS)	Primary School Enrolment (% of Gross)	World Bank (WDI)
Secondary Schooling (SS)	Secondary School Enrolment (% of Gross)	World Bank (WDI)
Tertiary Schooling (TS)	Tertiary School Enrolment (% of Gross)	World Bank (WDI)
Educational index	First principal component of PS, SS & TS	PCA
Government Expenditure	Government Final Expenditure (% of GDP)	World Bank (WDI)
Trade Openness	Exports plus Imports of Commodities (% of GDP)	World Bank (WDI)
GDP per capita growth	Gross Domestic Product per capita growth rate (annual %)	World Bank (WDI)
Inflation	Consumer Price Index (annual %)	World Bank (WDI)
Foreign Aid (NODA)	Net Official Development Assistance (% of GDP)	World Bank (WDI)
Democracy	Institutionalized Democracy (Estimate)	World Bank (WDI)

WDI: World Bank Development Indicators. GDP: Gross Domestic Product. PCA: Principal Component Analysis. NODA: Net Official Development Assistance.

Appendix 2: Summary Statistics

	Mean	S.D	Min	Max	Obs.
Political Stability	-0.571	0.952	-3.229	1.143	265
Voice & Accountability	-0.679	0.730	-2.161	1.047	265
Political Governance (Polgov)	-0.016	1.291	-3.204	2.621	264
Primary School Enrolment	94.414	25.647	28.298	149.70	237
Secondary School Enrolment	38.683	26.489	5.372	115.03	199
Tertiary School Enrolment	6.228	8.489	0.241	53.867	183
Educational index (Lifelong learning)	-0.070	1.327	-2.103	5.527	152
Government Expenditure	4.495	8.064	-17.387	49.275	164
Trade Openness	78.340	39.979	20.980	250.95	247
GDP per capita growth rate	2.320	5.016	-11.248	38.258	257
Inflation	56.191	575.70	-45.335	8603.3	230
Foreign Aid (NODA)	10.889	12.029	0.015	102.97	253
Democracy	2.373	3.871	-8.000	10.000	250

S.D: Standard Deviation. Min: Minimum. Max: Maximum. Obs: Observations.

Appendix 3: Correlation Analysis

Demo	NODA	Inflation	GDPpcg	Trade	Gov.Ex	PSE	SSE	TSE	Lifelong	PolSta	VA	Polgov	
1.000	-0.001	-0.058	0.036	0.005	0.051	0.229	0.291	-0.044	0.148	0.551	0.785	0.738	Demo
	1.000	-0.023	0.032	-0.083	0.078	-0.055	-0.488	-0.454	-0.456	-0.105	0.028	-0.040	NODA
		1.000	-0.105	0.024	-0.243	-0.064	-0.100	-0.081	-0.106	-0.098	-0.109	-0.114	Inflation
			1.000	0.245	0.245	0.149	0.058	0.047	0.115	0.071	0.008	0.043	GDPpcg
				1.000	-0.070	0.261	0.389	0.057	0.283	0.321	0.052	0.202	Trade
					1.000	0.019	0.013	0.092	0.087	-0.037	-0.037	-0.040	Gov. Ex
						1.000	0.452	0.257	0.635	0.294	0.251	0.299	PSE
							1.000	0.725	0.919	0.435	0.362	0.436	SSE
								1.000	0.843	0.081	-0.075	0.002	TSE
									1.000	0.299	0.196	0.268	Lifelong
										1.000	0.682	0.917	PolSta
											1.000	0.917	VA
												1.000	Polgov

Demo: Democracy. NODA: Net Official Development Assistance. GDPpcg: GDP per capita growth. Gov. Ex: Government Expenditure. PSE: Primary School Enrolment. SSE: Secondary School Enrolment. TSE: Tertiary School Enrolment. Lifelong: Lifelong Learning (Education index). PolSta: Political Stability. VA: Voice & Accountability. Polgov: Political Governance.

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