The Root Causes of Migration: Why Africans Leave their Homes

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In recent years, irregular migration from sub-Saharan Africa has been under the spotlight. Western media and politicians often use doomsday scenarios to describe the supposedly millions of desperate people knocking at the gates of the European Eldorado to escape poverty and warfare at home. Such a stereotypical conception of sub-Saharan African migration is not only overlooking its root causes, but it is also far from its real dynamics. Thus, inspired by the extensive literature on international migration and based on data availability, 27 potential root causes of migration were selected to cover 30 sub-Saharan countries for the period between 2002 and 2016. The sensitivity and robustness of each potential determinant of both net migration and refugee population is tested using the two approaches of extreme bounds analysis proposed by Leamer and Leonard, and Sala-I-Martin. The results reveal that gross domestic product per capita, domestic credit, trade, foreign direct investment inflows, external debt, youth unemployment, natural resources rents, international tourism, military expenditure, health expenditure, undernourishment, food production, life expectancy, HIV prevalence, population growth, corruption, voice and accountability, rule of law, government effectiveness, regulatory quality, and common law are the root causes of migration in sub-Saharan Africa.

Keywords: international migration; refugee; sub-Saharan Africa; extreme bounds analysis

INTRODUCTION

In recent years, irregular migration from sub-Saharan Africa has been under the spotlight. Western media and politicians often use doomsday scenarios to describe the supposedly millions of desperate people knocking at the gates of the European Eldorado to escape poverty and warfare at home. Such a stereotypical conception of sub-Saharan African migration is not only overlooking its root causes, but it is also far from its real dynamics (De Haas, 2008; Flahaux and De Haas, 2016; Magri, 2017).

The United Nations (2017) revealed that the number of international migrants worldwide had increased steadily between 2000 and 2017. Indeed, the number of international migrants had risen from 173 million in 2000, to 220 million in 2010, and about 258 million in 2017. The UN report also revealed that the additional migrants recorded between 2000 and 2017 primarily came from Asia (40.7 million), Africa (14.7 million), Latin America and the Caribbean (12.9 million), Europe (11.6 million), Northern America (1.2 million) and Oceania (700,000). Furthermore, the report revealed that despite the increasing number of African migrants, migration is still a marginal phenomenon on the continent as only 2% of Africans were migrants in 2017. This figure is superior to the 1.8% recorded in 2000 but it is still inferior to the world average (2.8% and 3.4% in 2000 and 2017 respectively).

The relative size of African migration can also be put into perspective by taking into account the total number of international migrants. In that vein, the UN (2017) revealed that of the 258 million of international migrants recorded worldwide in 2017, 41% were born in Asia, 23.7% in Europe, 14.6% in Latin America and the Caribbean and only 14.1% in Africa. Contrary to Western doomsday scenarios, the size and destinations of African migration are not just far from being exceptional, but they are also quite similar to global patterns (Magri, 2017). However, African migration has been under the spotlight because of the substantial number of migrants who lose their lives every year in the Sahara desert or the Mediterranean Sea, the enslavement and human trafficking associated with migrants' journeys, and the guilty fears of 'Fortress Europe'.

Historically, the roots of contemporary migration across the Sahara desert could be traced back to the ancient trans-Saharan trade. However, the phenomenon as we observe it today really began in the 1970s and 1980s when construction sites and oil fields in Algeria and Libya started attracting the nomads and traders operating in the region. In the aftermath of the air and arms embargo imposed on Libya by the UN Security Council between 1992 and 2000, Muammar al-Qaddafi opened the doors of Libya to sub-Saharan African workers and thereby magnified trans-Saharan migration (De Haas, 2008). The Arab Spring of 2010 and the collapse of al-Qaddafi's regime in 2011 led to a significant fall in economic opportunities for migrants, a surge in human trafficking across the Sahara, and increased migratory pressures at the doors of Europe. Thus, the number of migrants crossing the Mediterranean to enter Europe increased from 22,500 in 2012 to 219,000 in 2014 (UNHCR, 2015). European policy-makers responded to the migratory pressures with restric-

tive and externalized border controls that ultimately led to the professionalization of smuggling services and the diversification of trans-Saharan migration routes and trans-Mediterranean crossing points (De Haas, 2008; Cummings et al., 2015). The humanitarian crisis resulting from the abovementioned developments has placed African migration on the agenda of international meetings.

Migration is widely viewed as a complex phenomenon resulting from multiple, overlapping and sometimes shifting drivers (Carbone, 2017). Nevertheless, an in-depth knowledge of its causes is the cornerstone upon which any effective and durable policy response ought to be built (Cummings et al., 2015). Thus, this paper aims at assessing the root causes of international migration in sub-Saharan Africa using extreme bounds analysis (EBA). Inspired by an extensive literature (Massey et al., 1993, 1994; Black et al., 2006; Docquier, 2007; Faini, 2007; Kohnert, 2007; Bossard, 2008; Bredeloup, 2013; Duwicquet et al., 2014; Efionayi and Piguet, 2014; Cummings et al., 2015; Carbone, 2017; Press, 2017; Akanbi, 2017) and based on data availability, 27 potential root causes of migration were selected from the World Bank's World Development Indicators and Worldwide Governance Indicators. The data set covers 30 sub-Saharan countries for the period between 2002 and 2016. The robustness of each determinant of both net migration and refugee population is tested using the two different EBA approaches proposed by Leamer and Leonard (1983) and Sala-I-Martin (1997).

The remainder of this paper is organized as follows: international migration theories are reviewed in the next section; the methodology and the main findings of the paper are presented in section 3 and section 4 respectively; those findings are discussed in section 5 and the paper is concluded in section 6.

RELATED LITERATURE

Massey et al. (1993) argue that there is no single theory of international migration but rather a set of theories built upon different concepts, assumptions, and frames of reference. They distinguish the theories related to the initiation of international migration from those related to its perpetuation and thoroughly review the main modern theories of international migration. Massey et al. (1993) add that the initiation of international migration can be explained by neoclassical economics, the new economics of migration, dual or segmented labor market, and world systems theory. As for the perpetuation of international migration, it can be explained using network theory, institutional theory, cumulative causation, and migration systems theory.

Initiation of international migration

Neoclassical economics

At the macroeconomic level, the neoclassical theory of international migration was initially developed to explain the labor migration induced by economic development, while at the microeconomic level, it is built upon the theory of individual choice.

Neoclassical economics postulates that migration is an individual decision driven by the differences in wages and employment between countries (Massey et al., 1993, 1994). That is, people are incited to migrate when they realize that the employment opportunities and/or higher wages available abroad are worth the cost and risks associated with migration. Thus, the mismatch between the economic expectations of sub-Saharan Africans in terms of employment and wages and the reality of the labor market in their home countries is often cited as a driver of migration, especially for the youth (Kohnert, 2007; Carbone, 2017).

Neoclassical economics focuses exclusively on labor market dynamics and postulates that in the long-run, migration itself will lead to the elimination of the initial differences in wages and employment between countries and bring about equilibrium in the global labor market. Thereafter, there will be no more incentive for people to migrate because labor market characteristics would have become similar in all countries.

The new economics of migration

According to the new economics of migration, the decision to migrate is not an individual decision but rather a collective one made at the level of a household or a family. Moreover, migration is not only driven by an income maximization strategy induced by international disequilibria in labor markets, but it is rather a risk minimization strategy induced by a wide range of market failures apart from those existing in labor markets. Indeed, contrary to neoclassical economics, migration is now viewed as resulting from the absence, imperfection or inaccessibility of certain markets (Massey et al., 1993, 1994). Thus, households or families send members abroad to minimize the risks and/or loosen the constraints associated with those market failures. Furthermore, the aim of migration is not just to reduce the household's deprivation in absolute terms, but also to improve its situation compared with some reference groups such as other local households.

In line with the new economics of migration, the inefficiency characterizing healthcare (absence of health insurance, epidemic/endemic prevalence of HIV/AIDS, Ebola and malaria), credit markets (high interest rates, absence of stock market), agriculture and food supply (food crises, absence of crop insurance) as well as utilities (limited access to electricity and drinking water) in sub-Saharan Africa is often cited (Massey et al., 1993, 1994; Bossard, 2008; Carbone, 2017; Mago, 2018) as a root cause of migration. This is particularly true when the remittances sent home help improve the health status of family members, increase land productivity and provide access to capital and utilities.

Dual labor market

According to this theory, international migration does not really stem from a rational decision made at the individual or collective level in response to some market forces

as argued in neoclassical economics and in the new economics of migration. Instead, international migration is driven by the everlasting demand for immigrant labor that is consubstantial with the economic structure of developed countries (Massey et al., 1993, 1994). Thus, De Haas (2008) argues that the structural demand for cheap migrant labor is one of the factors explaining the surge in African migration to Europe. He adds that sub-Saharan migrants are attracted to North Africa and Europe by the structural demand for cheap labor in agriculture, construction, fishery, petty trade, and the informal service sector.

World systems theory

World systems theory views international migration as a natural corollary of global capitalism. Indeed, as capitalism spreads from core economies in Europe and North America to peripheral economies in the developing world, it disrupts pre-existing patterns of economic, social, and cultural organization and creates an uprooted population prone to migrate (Massey et al., 1993, 1994). In the case of sub-Saharan Africa, colonization and neoliberal capitalism have brought about financial liberalization, free trade, privatization of state-owned companies, atrophy of welfare policies, adoption of Western religions and educational systems, and the ineluctable tyranny of foreign aid, debt, and investments. Combined with the unfair subsidies, non-tariff barriers, and dumping prices implemented by core capitalist countries (Kohnert, 2007), those artifacts have altered the core identity of Africans and created masses prone to migrate.

Globalization of the market economy does not only fuel a structural demand for cheap migrant labor in construction and agriculture, but also a structural demand for highly qualified migrants in electronics, finance, law, and science (Massey et al., 1994). This second demand leads to a substantial brain drain (Black et al., 2006; Docquier, 2007; Faini, 2007; Bourgain et al., 2010) and some additional disruptions as it delays the development of a middle class as well as that of a sustainable civil society (Kohnert, 2007). Highly qualified workers traditionally migrate to former colonial powers even though recent data shows a growing diversification of migration destinations. Some core capitalist economies such as the United States of America (USA) and Canada even implement attractive migration policies for qualified migrants (Flahaux and De Haas, 2016).

Perpetuation of international migration

Network theory

According to network theory, migration is perpetuated through the creation of interpersonal ties – friendship, kinship, and common community origin – linking former migrants, migrants and, non-migrants in both origin and destination countries. The network thus created increases the benefits and reduces the costs and risks of migration (Massey et al., 1993, 1994). Internet-based technology and social media

have greatly facilitated the creation and improved the performance of contemporary migration networks (Cummings et al., 2015) as they expose non-migrants to the seemingly better lifestyle of migrants in destination countries. They are also used to inform, guide, and coordinate the actions of migrants and aspiring migrants.

Institutional theory

Massey et al. (1993) argue that because of the creation and sophistication of for-profit organizations supporting, sustaining, and promoting migration, migratory flows have become more institutionalized and less dependent on the factors that initially caused them. Such a pattern ultimately leads to a feedback loop in which migration is perpetuated. These for-profit organizations range from multinationals such as Accès Canada, providing legal assistance to those Africans longing for a permanent residence in Canada, to the smugglers helping migrants to cross the Mediterranean on makeshift boats.

Cumulative causation

According to cumulative causation, migration perpetuates itself over time independently of its initial causes as every new migrant alters the social environment in which next migration decisions will be made (Massey et al., 1993, 1994). Indeed, each act of migration reduces the costs and risks of migration for friends, family members or compatriots and could therefore induce subsequent acts of migration. Furthermore, remittances do not only alter the distribution of income, land, and other assets in home community, but they also alter social statuses and create additional incentive for subsequent migration.

Migration systems theory

Inspired by the cumulative causation, institutional theory, network theory, and world systems theory, it can be argued that migration acquires some momentum over time and space and leads to the formation of what can be called international migration systems. Those migration systems are characterized by unusually large flows of migrants moving from peripheral countries to core countries (Massey et al., 1993). The case of former colonial powers and their former colonies is particularly relevant in sub-Saharan Africa. Thus, France tends to be the primary destination for Cameroonian, Ivorian, Gabonese, Malian or Senegalese students who can afford studies in Europe.

After reviewing international migration theories as presented by Massey et al. (1993), it appears that those theories fail to fully grasp the multidimensional complexity of contemporary migration dynamics (Mago, 2018). For instance, it is well documented that modern-day African migration is also driven by factors such as political instability and conflicts, droughts and other environmental issues (Flahaux and De Haas, 2016; Vigil, 2017; Carbone, 2017) but the abovementioned theories do

not pay attention, either to institutions or to climate change.

New approaches of international migration

The role of institutions

The destiny of nations often depends on their institutions. A sound institutional framework protects human and property rights, sustains democracy and social justice, and constitutes the foundation upon which everything else is built. Thus, institutions do have an impact on international migration: by providing government officials with the prerogatives necessary for repression and marginalization, they create refugees; by allowing privatization, delocalization, and poor welfare policies, they create economic migrants; by tolerating the loopholes inciting police officers to be corrupt by smugglers, they promote illegal migration.

Focusing on Africa, it is evident that the Eritrean autocracy is leading to substantial population outflows. Indeed, in its 2015 risk analysis, the European border and coast guard agency (Frontex) revealed that about 34,500 Eritreans were caught trying to cross European borders illegally. This 200 percent increase from the previous year (11,300 Eritreans caught) places the autocracy as the second largest sending country after war-torn Syria. The figures are all the more impressive because Eritrea has fewer than 6 million inhabitants. Hirt (2017) even argues that the Eritreans caught on European shores represent only a small percentage of those who have left the country since the introduction of an open-ended military service in 2002.

Elsewhere on the continent, on the one hand the UNHCR (2018) revealed that political instability and conflict in neighboring countries have brought to Uganda the third largest refugee population in the world (1.4 million in 2017) behind Turkey (3.5 million) and Pakistan (1.4 million). On the other hand, Cummings et al. (2015) argue that the institutional instability associated with the Arab Spring has led to an increase in illegal migration to Europe.

The role of climate change

Vigil (2017) argues that taking into consideration the pre-existing economic, social, and political problems as well as the geographical vulnerability to natural disasters and rapid demographic expansion, African populations are most affected by climate change and environmental issues. She adds that the causal relationship between climate change and migration is complex and polymorphs with climate change, altering or amplifying pre-existing migration dynamics rather than really causing them.

Paying attention to its almost endemic poverty and conflicts, its fast-growing population and its high climate oscillation, Vigil (2017:53) describes the Sahel region as "ground zero for climate change". It is therefore no accident that Press (2017) describes the Sahelian city of Agadez, Niger as one of the most important hubs for African migrants going to Europe through the central Mediterranean route. Furthermore, Frontex (2018) data reveals that out of the 204,718 migrants caught trying to

cross European borders illegally in 2017, 118,962 (58.11%) came through that central Mediterranean route.

In fine, after reviewing studies and theories related to international migration, it appears that no previous paper has attempted to assess the determinants of migration using econometric models. This paper intends to fill that gap in the literature.

METHODOLOGY

The aim of this paper is to assess the root causes of international migration in sub-Saharan Africa using extreme bounds analysis (EBA). This econometric tool used to test the sensitivity and the robustness of each variable, allows us to highlight the most significant causes of international migration in sub-Saharan Africa.

Data

Inspired by an extensive literature (Massey et al., 1993, 1994; Black et al., 2006; Docquier, 2007; Faini, 2007; Kohnert, 2007; Bossard, 2008; Bredeloup, 2013; Duwicquet et al., 2014; Efionayi and Piguet, 2014; Cummings et al., 2015; Carbone, 2017; Press, 2017; Akanbi, 2017) and based on data availability, 27 potential determinants of migration were selected from the World Bank's World Development Indicators and Worldwide Governance Indicators. The data set covers 30 sub-Saharan countries for the period between 2002 and 2016. These determinants of migration are:

Access_Electricity: Percentage of the population having access to electricity.

Drinking_Water: Percentage of the population using drinking water services.

Energy_Imports: Energy imports expressed as percentage of energy used in the country.

Health_Expenditure: Domestic general government health expenditure expressed as percentage of gross domestic product (GDP).

OOP_Expenditure: Amount spent on health issues out of the pocket of individuals expressed as percentage of current health expenditure. This variable captures the extent to which people are covered by health insurance.

Life_Expectancy: Life expectancy at birth expressed in years.

HIV_Prevalence: Percentage of the population aged between 15 and 49 years, living with HIV/AIDS.

FDI_Inflows: Net inflows of foreign direct investments (FDIs) expressed as percentage of GDP.

GDP_per_Capita: Annual growth rate of the GDP per capita.

Trade: Imports plus exports expressed as percentage of GDP.

External_Debt: External debt stock expressed as percentage of GDP.

Current_Account: Current account balance or budget deficit expressed as percentage of GDP.

Youth_Unemployment: Unemployment rate in the population aged between 15-24 years.

Domestic_Credit: Domestic credit provided by the country's financial sector expressed as percentage of GDP.

International_Tourism: Receipts from international tourism expressed as percentage of total exports.

Population_Growth: Annual growth rate of the population.

Undernourishment: Depth of the food deficit expressed in kilocalorie per person and per day.

Food_Production: Food production index.

Military_Expenditure: Government military expenditure expressed as percentage of GDP.

Natural_Resources_Rents: Total rents received from the exploitation of oil, natural gas, forests and minerals. This variable accounts for the suspicions related to resource curse.

Political_Stability: This accounts for political stability and the absence of conflict and terrorism.

Rule_Law: Rule of law accounts for the extent to which contracts, rules, and laws are binding.

Voice_Accountability: Voice and accountability account for the extent to which elections are free and fair and the extent to which the fundamental rights of citizens are respected.

Government_Eff: Government effectiveness accounts for the quality of public services, policies and actions.

Regulatory_Qlty: Regulatory quality accounts for the quality of government regulations.

Corruption: Control of corruption accounts for the extent to which public prerogatives are used for private interests.

Common_Law: La Porta et al. (2008) argue that the legal origin (common law or civil law) of a country's institutions has a significant impact on its economic performances. This is a dummy variable equal to 1 for common law countries and 0 for the others.

The robustness of these determinants is tested on both net migration (economic migrants) and refugees (asylum-seekers). Cummings et al. (2015) argue that those categories are too rigid to reflect reality because the drivers of migration are too numerous and dynamic. They add that refugees for instance, are not only seeking safety because safety is not the only thing they lost. However, the availability of data allows us to make such a distinction.

Refugee_Intensity: Refugee population by country of origin expressed as percentage of the country's total population.

Migration_Intensity: Difference between immigrants and emigrants expressed as percentage of the country's total population.

Extreme bounds analysis

Leamer (1983, 1985) criticizes the tendency of traditional econometrics to lead to fragile inference because small changes in the list of explanatory variables could lead to fundamentally different results. As a result, Leamer and Leonard (1983) propose a procedure to assess the robustness and sensitivity of the explanatory variables included in econometric models. The procedure, called extreme bounds analysis, is a relatively neutral procedure through which variables can be selected for an empirical model when the theoretical determinants of a phenomenon are ambiguous or conflicting (Chanegriha et al., 2014), like in the case of international migration.

Let us assume that international migration can be explained by the following model:

$$m_t = \alpha_0 + \alpha_1 x_t + \alpha_2 i_t + \alpha_3 d_t + \varepsilon_t \quad (1)$$

Where t represents the years and m stands for the number of economic migrants or refugees; x is a matrix containing variables that have an undeniable effect on migration: political stability for instance, has an undeniable effect on the number of refugees; i is the variable of interest; that is, the determinant for which we want to test robustness and sensitivity; $d \in D$ is a matrix containing a limited number of other doubtful determinants of international migration taken from the pool D of n available determinants. Finally, ε is the error term and α_i (i=1,2,3) are parameters to be estimated.

The model is estimated for all the possible combinations of $d \in D$. For each regression, an estimate of α_2 and its corresponding standard error σ_2 are reported. The lower extreme bound is equal to $\alpha_2 - 2\sigma_2$ and the upper extreme bound is equal to $\alpha_2 + 2\sigma_2$. The decision rule for the variable of interest goes like this: if the lower extreme bound is negative and the upper extreme bound is positive, then the variable of interest is not a robust determinant of migration. Sala-I-Martin (1997) argues that such a robustness test is too restrictive because it takes only one regression (out of many) for which α_2 is insignificant or has another sign to conclude that the variable of interest is not robust. Sala-I-Martin (1997) then proposes an alternative form of EBA in which a particular attention is paid to the entire distribution of α_2. In this alternative approach, the robustness of a variable is based on the fraction of the density function lying on the left and on the right of zero. Thus, if at least 95 percent of the cumulative distribution function (CDF) of α_2 lies in either side of zero, it is concluded that the variable of interest is robust.

EBA has been used to assess the determinants of economic growth (Levine and Renelt, 1992) and foreign direct investments (Moosa and Cardak, 2006; Chane-

griha et al., 2014). Young et al. (2007) and Ghosh and Yamarik (2004) have used it respectively to find out if the effect of the black population on economic growth is robust and if the effect of regional trade arrangement on trade creation is robust. In spite of its appealing characteristics, EBA is not a flawless procedure as it can lead to multicollinearity and the inflation of standard errors (Levine and Renelt, 1992). Besides, EBA is also criticized for replacing discretionary model selection with discretionary variable segmentation (McAleer et al., 1985).

In order to address those issues, some restrictions are imposed upon the EBA used in this paper. Following Levine and Renelt (1992), the list of variables included in x and allowed in all regressions has been reduced. Thus, only one explanatory variable (political stability) is included in all the models dealing with refugee populations and no variable is considered to have an undeniable effect on net migration. Furthermore, for each variable of interest i, the pool of variables from which d can be selected is restricted by excluding all the variables that, in theory, might point to the same phenomenon or be highly correlated. So, health expenditure and out-of-pocket health expenditure are not allowed in the same model. This is also the case for budget deficit (current account) and external debt, and for undernourishment and food production. Following Hlavac (2016), the variance inflation factor (VIF) is not allowed to exceed 7 in order to address multicollinearity. Moreover, in order to give more importance to estimation results from models with a better fit, each regression is weighted by its own likelihood ratio index (LRI).

MAIN FINDINGS

The robustness of each of the above determinants of migration is tested using ordinary least squares estimates of the two EBA approaches proposed by Leamer and Leonard (1983) and Sala-I-Martin (1997). Overall, 19,878 and 17,001 models were estimated with net migration and refugee population as dependent variables respectively. A summary of the EBA reported in Table 1 and Table 5 shows the number of regressions and the average coefficient associated with each variable. Those tables also report the average standard errors of the coefficients and the percentage of regressions in which each variable is significant. Figure 1 and Figure 2 show the overall distribution function of each variable with the corresponding kernel density curves superimposed on the histogram. Those curves are non-parametric approximations of the shape of each variable's distribution.

Net migration

Focusing on the EBA proposed by Leamer and Leonard (1983), Table 2 shows that none of the 27 variables is a robust determinant of net migration because the lower and the upper extreme bounds do not have the same sign. As argued by Sala-I-Martin (1997), the EBA proposed by Leamer and Leonard (1983) is too restrictive because it takes only one regression for which the coefficient is insignificant or has another sign

to conclude that the variable of interest is fragile.

Table 3 reports the EBA proposed by Sala-I-Martin (1997) in which it is assumed that the coefficients follow a normal distribution. The results show that domestic credit, health expenditure, natural resources rents, youth unemployment, population growth, HIV prevalence, trade, and voice and accountability are robust determinants of net migration.

Table 1: Summary output (net migration)

Variable	Nb. Regressions	W.M. Beta	W.M. Std Error	% Significance
Intercept	19878	-2.391	1.977	33.087
Political_Stability	2877	0.115	0.605	7.925
Corruption	2877	-0.724	1.124	10.845
Current_Account	2578	-0.021	0.045	0.155
Domestic_Credit	2877	0.028	0.013	23.740
Health_Expenditure	2578	-0.743	0.436	58.650
External_Debt	2578	0.019	0.012	17.067
FDI_Inflows	2877	-0.015	0.026	0.070
GDP_per_Capita	2877	0.088	0.096	0.174
International_Tourism	2877	0.063	0.043	21.168
Life_Expectancy	2877	0.096	0.076	6.396
OOP_Expenditure	2578	0.033	0.024	40.109
Population_Growth	2877	2.590	0.671	90.059
HIV_Prevalence	2877	-0.270	0.062	97.254
Undernourishment	2578	0.036	0.039	5.198
Nat_Res_Rents	2877	0.103	0.040	61.453
Trade	2877	-0.056	0.016	90.233
Access_Electricity	2877	0.037	0.022	20.438
Energy_Imports	2877	-0.003	0.002	18.074
Drinking_Water	2877	0.051	0.031	17.657
Food_Production	2578	0.002	0.015	0.543
Youth_Unemployment	2877	-0.058	0.032	57.212
Military_Expenditure	2877	0.189	0.314	1.043
Rule_Law	2877	0.465	1.115	19.472
Voice_Accountability	2877	2.949	0.795	97.497
Government_Eff	2877	1.566	1.204	26.217
Regulatory_Qlty	2877	-0.502	1.071	11.679
Common_Law	2877	-0.795	0.964	13.625

Note: Nb. Regressions stands for number of regressions; W.M. Beta stands for the weighted mean of Beta; W.M. Std Error stands for the weighted mean of the standard error of Beta and % Significance stands for the proportion of regressions in which each variable is significant.

Table 2: Leamer EBA (net migration)

Variable	Type	LEB	UEB	Decision
Intercept	Free	-34.574	15.856	Fragile
Political_Stability	Focus	-3.138	2.797	Fragile
Corruption	Focus	-7.926	4.658	Fragile
Current_Account	Focus	-0.194	0.124	Fragile
Domestic_Credit	Focus	-0.035	0.080	Fragile
Health_Expenditure	Focus	-2.527	1.246	Fragile
External_Debt	Focus	-0.020	0.065	Fragile
FDI_Inflows	Focus	-0.110	0.085	Fragile
GDP_per_Capita	Focus	-0.208	0.398	Fragile
International_Tourism	Focus	-0.116	0.259	Fragile
Life_Expectancy	Focus	-0.237	0.401	Fragile
OOP_Expenditure	Focus	-0.079	0.132	Fragile
Population_Growth	Focus	-1.632	6.446	Fragile
HIV_Prevalence	Focus	-0.552	0.088	Fragile
Undernourishment	Focus	-0.114	0.270	Fragile
Nat_Res_Rents	Focus	-0.113	0.323	Fragile
Trade	Focus	-0.144	0.020	Fragile
Access_Electricity	Focus	-0.111	0.193	Fragile
Energy_Imports	Focus	-0.012	0.009	Fragile
Drinking_Water	Focus	-0.146	0.233	Fragile
Food_Production	Focus	-0.060	0.073	Fragile
Youth_Unemployment	Focus	-0.201	0.103	Fragile
Military_Expenditure	Focus	-0.955	1.436	Fragile
Rule_Law	Focus	-9.495	7.349	Fragile
Voice_Accountability	Focus	-0.255	7.658	Fragile
Government_Eff	Focus	-8.288	9.948	Fragile
Regulatory_Qlty	Focus	-7.451	5.040	Fragile
Common_Law	Focus	-4.802	3.172	Fragile

Note: LEB and UEB stand for lower extreme bound and upper extreme bound respectively.

Table 3: Sala-I-Martin EBA (net migration)
Normal model: Beta coefficients are assumed to be distributed normally across models

Variable	Type	CDF (beta ≤ 0)	CDF (beta > 0)	Decision
Intercept	Free	85.138	14.862	Fragile
Political_Stability	Focus	42.536	57.464	Fragile
Corruption	Focus	73.466	26.534	Fragile
Current_Account	Focus	68.272	31.728	Fragile
Domestic_Credit	Focus	1.432	**98.568**	**Robust**
Health_Expenditure	Focus	**95.514**	4.486	**Robust**
External_Debt	Focus	5.047	94.953	Fragile
FDI_Inflows	Focus	71.844	28.156	Fragile
GDP_per_Capita	Focus	18.019	81.981	Fragile
International_Tourism	Focus	7.019	92.981	Fragile
Life_Expectancy	Focus	10.550	89.450	Fragile
OOP_Expenditure	Focus	7.927	92.073	Fragile
Population_Growth	Focus	0.006	**99.994**	**Robust**
HIV_Prevalence	Focus	**99.999**	0.001	**Robust**
Undernourishment	Focus	17.778	82.222	Fragile
Nat_Res_Rents	Focus	0.517	**99.483**	**Robust**
Trade	Focus	**99.972**	0.028	**Robust**
Access_Electricity	Focus	5.074	94.926	Fragile
Energy_Imports	Focus	93.160	6.840	Fragile
Drinking_Water	Focus	5.229	94.771	Fragile
Food_Production	Focus	45.140	54.860	Fragile
Youth_Unemployment	Focus	**96.361**	3.639	**Robust**
Military_Expenditure	Focus	27.473	72.527	Fragile
Rule_Law	Focus	34.498	65.502	Fragile
Voice_Accountability	Focus	0.014	**99.986**	**Robust**
Government_Eff	Focus	10.497	89.503	Fragile
Regulatory_Qlty	Focus	67.498	32.502	Fragile
Common_Law	Focus	79.489	20.511	Fragile

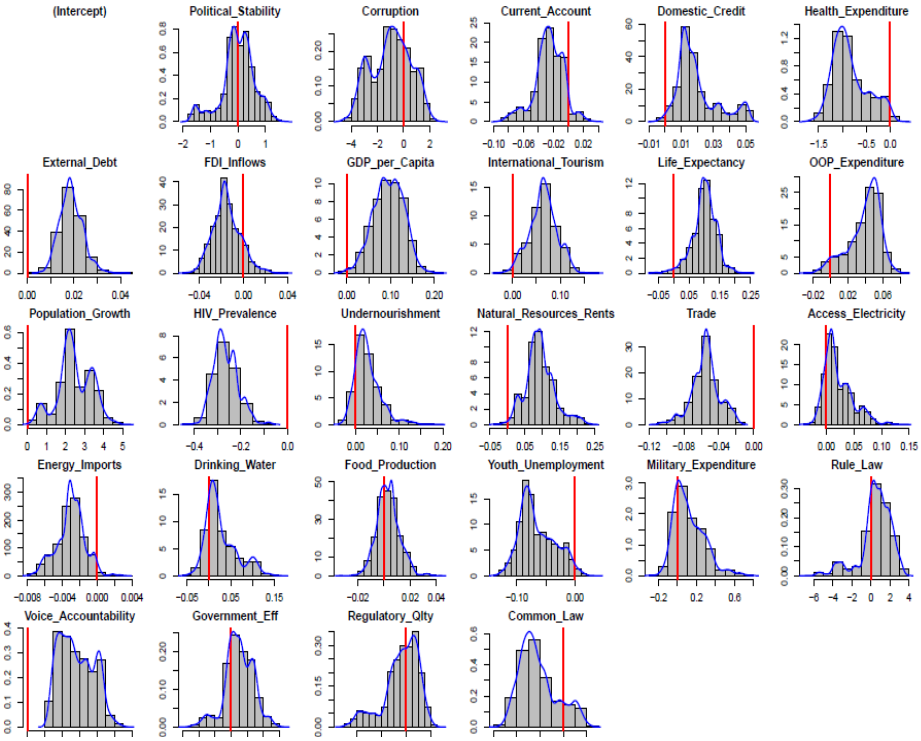
Note: CDF (beta ≤ 0) and CDF (beta > 0) stand for fraction of the cumulative density function lying on the left and the right of zero respectively.

Table 4: Sala-I-Martin EBA (net migration)
Generic model: no assumption about the distribution of beta coefficients across models

Variable	Type	CDF (beta ≤ 0)	CDF (beta > 0)	Decision
Intercept	Free	58.775	41.225	Fragile
Political_Stability	Focus	41.601	58.399	Fragile
Corruption	Focus	59.232	40.768	Fragile
Current_Account	Focus	66.141	33.859	Fragile
Domestic_Credit	Focus	7.801	92.199	Fragile
Health_Expenditure	Focus	88.821	11.179	Fragile
External_Debt	Focus	6.720	93.280	Fragile
FDI_Inflows	Focus	69.229	30.771	Fragile
GDP_per_Capita	Focus	19.735	80.265	Fragile
International_Tourism	Focus	11.431	88.569	Fragile
Life_Expectancy	Focus	14.237	85.763	Fragile
OOP_Expenditure	Focus	14.645	85.355	Fragile
Population_Growth	Focus	1.911	**98.089**	**Robust**
HIV_Prevalence	Focus	**99.731**	0.269	**Robust**
Undernourishment	Focus	25.861	74.139	Fragile
Nat_Res_Rents	Focus	5.299	94.701	Fragile
Trade	Focus	**99.051**	0.949	**Robust**
Access_Electricity	Focus	15.341	84.659	Fragile
Energy_Imports	Focus	88.093	11.907	Fragile
Drinking_Water	Focus	16.527	83.473	Fragile
Food_Production	Focus	46.570	53.430	Fragile
Youth_Unemployment	Focus	88.760	11.240	Fragile
Military_Expenditure	Focus	30.578	69.422	Fragile
Rule_Law	Focus	32.533	67.467	Fragile
Voice_Accountability	Focus	0.158	**99.842**	**Robust**
Government_Eff	Focus	22.283	77.717	Fragile
Regulatory_Qlty	Focus	50.831	49.169	Fragile
Common_Law	Focus	71.590	28.410	Fragile

Note: CDF (beta ≤ 0) and CDF (beta > 0) stand for fraction of the cumulative density function lying on the left and the right of zero respectively.

Figure 1: The determinants of net migration



As for the alternative results reported in table 4, there are coming from a generic model in which coefficients are not assumed to follow a particular distribution. The table shows that net migration is robustly influenced by population growth, HIV prevalence, trade, and voice and accountability.

Refugee population

Table 6 reports the EBA proposed by Leamer and Leonard (1983). It shows that FDI inflows, military expenditure, GDP per capita, and voice and accountability are robust determinants of refugee populations. Table 7 and Table 8 report the EBA proposed by Sala-I-Martin (1997) for the normal and generic distributions, respectively. On the one hand, assuming that the coefficients follow a normal distribution, it is found that political stability, FDI inflows, international tourism, HIV prevalence, corruption, GDP per capita, undernourishment, food production, military expenditure, voice and accountability, domestic credit, natural resources rents, youth unemployment, rule of law, government effectiveness, common law, external debt, life expectancy, and regulatory quality have a robust impact on refugee populations. On

the other hand, the generic model reveals that political stability, FDI inflows, international tourism, HIV prevalence, corruption, GDP per capita, undernourishment, food production, military expenditure, voice and accountability, and external debt are robust determinants of refugee populations.

DISCUSSION

The empirical findings derived from both of the EBA approaches call for some discussions.

Net migration

The EBA reveals that domestic credit has a robust positive impact on net migration. This contradicts the new economics of migration according to which market failures such as limited domestic credit should induce migration. However, in line with De Haas (2008), such a finding could be due to the fact that the availability of credit increases the capabilities to migrate. The results also reveal that both health expenditure and HIV prevalence negatively affect migration. Indeed, it can be inferred that a government allocating a substantial portion of its budget to healthcare improves the health outcomes of its citizens and reduces their aspiration to migrate for health purposes. As for the effect of HIV/AIDS, it can be argued that people suffering from the disease are not in a good health condition to migrate.

Table 5: Summary output (refugee population)

Variable	Nb. Regressions	W.M. Beta	W.M. Std Error	% Significance
Intercept	17001	-0.015	0.086	47.397
Political_Stability	17001	-0.146	0.027	96.977
Corruption	2554	0.209	0.053	73.923
Current_Account	2279	0.001	0.002	12.418
Domestic_Credit	2554	-0.001	0.001	49.413
Health_Expenditure	2279	0.008	0.019	24.177
External_Debt	2279	0.002	0.001	93.111
FDI_Inflows	2554	0.012	0.001	100.000
GDP_per_Capita	2554	0.018	0.004	100.000
International_Tourism	2554	0.006	0.002	84.691
Life_Expectancy	2554	0.009	0.003	84.299
OOP_Expenditure	2279	0.001	0.001	19.877
Population_Growth	2554	0.014	0.029	27.095
HIV_Prevalence	2554	-0.013	0.003	98.395
Undernourishment	2279	0.007	0.002	97.718
Nat_Res_Rents	2554	0.004	0.002	64.409
Trade	2554	0.000	0.001	7.948
Access_Electricity	2554	-0.001	0.001	30.266
Energy_Imports	2554	0.000	0.000	12.060
Drinking_Water	2554	0.001	0.001	13.743
Food_Production	2279	-0.004	0.001	94.471
Youth_Unemployment	2554	0.004	0.001	75.059
Military_Expenditure	2554	0.108	0.014	100.000
Rule_Law	2186	-0.119	0.054	53.111
Voice_Accountability	2554	-0.200	0.037	100.000
Government_Eff	2554	-0.113	0.056	46.166
Regulatory_Qlty	2554	-0.092	0.051	48.473
Common_Law	2554	0.087	0.040	61.355

Note: Nb. Regressions stands for number of regressions; W.M. Beta stands for the weighted mean of Beta; W.M. Std Error stands for the weighted mean of the standard error of Beta and % Significance stands for the proportion of regressions in which each variable is significant.

Table 6: Leamer EBA (refugee population)

Variable	Type	LEB	UEB	Decision
Intercept	Free	-1.806	1.464	Fragile
Political_Stability	Free	-0.359	0.069	Fragile
Corruption	Focus	-0.132	0.759	Fragile
Current_Account	Focus	-0.009	0.011	Fragile
Domestic_Credit	Focus	-0.005	0.003	Fragile
Health_Expenditure	Focus	-0.119	0.124	Fragile
External_Debt	Focus	-0.001	0.004	Fragile
FDI_Inflows	Focus	**0.007**	**0.016**	**Robust**
GDP_per_Capita	Focus	**0.003**	**0.034**	**Robust**
International_Tourism	Focus	-0.005	0.018	Fragile
Life_Expectancy	Focus	-0.014	0.031	Fragile
OOP_Expenditure	Focus	-0.005	0.009	Fragile
Population_Growth	Focus	-0.275	0.202	Fragile
HIV_Prevalence	Focus	-0.044	0.003	Fragile
Undernourishment	Focus	-0.002	0.020	Fragile
Nat_Res_Rents	Focus	-0.009	0.015	Fragile
Trade	Focus	-0.004	0.005	Fragile
Access_Electricity	Focus	-0.010	0.007	Fragile
Energy_Imports	Focus	-0.001	0.001	Fragile
Drinking_Water	Focus	-0.007	0.012	Fragile
Food_Production	Focus	-0.006	0.001	Fragile
Youth_Unemployment	Focus	-0.005	0.016	Fragile
Military_Expenditure	Focus	**0.002**	**0.174**	**Robust**
Rule_Law	Focus	-0.806	0.313	Fragile
Voice_Accountability	Focus	**-0.401**	**-0.032**	**Robust**
Government_Eff	Focus	-0.772	0.339	Fragile
Regulatory_Qlty	Focus	-0.498	0.279	Fragile
Common_Law	Focus	-0.138	0.362	Fragile

Note: LEB and UEB stand for lower extreme bound and upper extreme bound respectively.

Table 7: Sala-I-Martin EBA (refugee population)
Normal model: Beta coefficients are assumed to be distributed normally across models

Variable	Type	CDF (beta ≤ 0)	CDF (beta > 0)	Decision
Intercept	Free	56.021	43.979	Fragile
Political_Stability	Free	**100.000**	0.000	**Robust**
Corruption	Focus	0.005	**99.995**	**Robust**
Current_Account	Focus	31.599	68.401	Fragile
Domestic_Credit	Focus	**96.964**	3.036	**Robust**
Health_Expenditure	Focus	32.459	67.541	Fragile
External_Debt	Focus	0.011	**99.989**	**Robust**
FDI_Inflows	Focus	0.000	**100.000**	**Robust**
GDP_per_Capita	Focus	0.001	**99.999**	**Robust**
International_Tourism	Focus	0.029	**99.971**	**Robust**
Life_Expectancy	Focus	0.201	**99.799**	**Robust**
OOP_Expenditure	Focus	18.245	81.755	Fragile
Population_Growth	Focus	32.100	67.900	Fragile
HIV_Prevalence	Focus	**100.000**	0.000	**Robust**
Undernourishment	Focus	0.001	**99.999**	**Robust**
Nat_Res_Rents	Focus	0.718	**99.282**	**Robust**
Trade	Focus	39.977	60.023	Fragile
Access_Electricity	Focus	85.959	14.041	Fragile
Energy_Imports	Focus	81.346	18.654	Fragile
Drinking_Water	Focus	30.336	69.664	Fragile
Food_Production	Focus	**100.000**	0.000	**Robust**
Youth_Unemployment	Focus	0.123	**99.877**	Fragile
Military_Expenditure	Focus	0.000	**100.000**	**Robust**
Rule_Law	Focus	**98.379**	1.621	**Robust**
Voice_Accountability	Focus	**100.000**	0.000	**Robust**
Government_Eff	Focus	**97.481**	2.51	**Robust**
Regulatory_Qlty	Focus	**96.104**	3.896	**Robust**
Common_Law	Focus	1.484	**98.516**	**Robust**

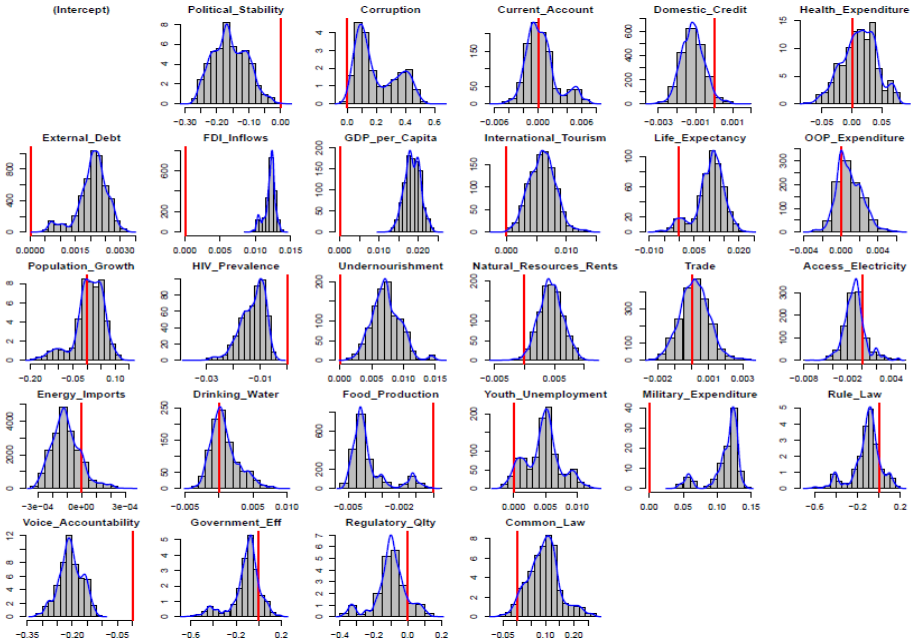
Note: CDF (beta ≤ 0) and CDF (beta > 0) stand for fraction of the cumulative density function lying on the left and the right of zero respectively.

Table 8: Sala-I-Martin EBA (refugee population)
Generic model: No assumption about the distribution of beta coefficients across models

Variable	Type	CDF (beta ≤ 0)	CDF (beta > 0)	Decision
Intercept	Free	51.526	48.474	Fragile
Political_Stability	Free	**99.331**	0.669	**Robust**
Corruption	Focus	3.251	**96.749**	**Robust**
Current_Account	Focus	43.305	56.695	Fragile
Domestic_Credit	Focus	90.303	9.697	Fragile
Health_Expenditure	Focus	40.325	59.675	Fragile
External_Debt	Focus	0.737	**99.263**	**Robust**
FDI_Inflows	Focus	0.000	**100.000**	**Robust**
GDP_per_Capita	Focus	0.004	**99.996**	**Robust**
International_Tourism	Focus	1.526	**98.474**	**Robust**
Life_Expectancy	Focus	10.140	89.860	Fragile
OOP_Expenditure	Focus	29.568	70.432	Fragile
Population_Growth	Focus	34.564	65.436	Fragile
HIV_Prevalence	Focus	**99.859**	0.141	**Robust**
Undernourishment	Focus	0.305	**99.695**	**Robust**
Nat_Res_Rents	Focus	5.320	94.680	Fragile
Trade	Focus	43.466	56.534	Fragile
Access_Electricity	Focus	76.883	23.117	Fragile
Energy_Imports	Focus	76.289	23.711	Fragile
Drinking_Water	Focus	42.168	57.832	Fragile
Food_Production	Focus	**99.068**	0.932	**Robust**
Youth_Unemployment	Focus	10.682	89.318	Fragile
Military_Expenditure	Focus	0.006	**99.994**	**Robust**
Rule_Law	Focus	83.158	16.842	Fragile
Voice_Accountability	Focus	**99.999**	0.001	**Robust**
Government_Eff	Focus	81.133	18.867	Fragile
Regulatory_Qlty	Focus	82.264	17.736	Fragile
Common_Law	Focus	11.287	88.713	Fragile

Note: CDF (beta ≤ 0) and CDF (beta > 0) stand for fraction of the cumulative density function lying on the left and the right of zero respectively.

Figure 2: The determinants of refugee populations



Trade was found to have a robust negative impact on migration. The finding contradicts world systems theory according to which capitalism creates an uprooted population prone to migrate. This could be due to the fact that international trade is often associated with job creation in Africa. Indeed, a substantial fraction of the workforce is employed in the production of cash crops such as cocoa, coffee, tobacco, tea or banana destined for international markets, while a new set of jobs related to imported electronic devices such as smartphones, tablets, and computers is spreading across the continent. These jobs range from importers (wholesalers) and small traders (retailers) to petty repairers.

The results also show that population growth has a robust positive effect on net migration. Such a finding is in line with Carbone (2017) who cites the massive expansion of African populations as a root cause of migration. He reveals that the population of sub-Saharan Africa has doubled between 1990 (493 million) and 2015 (1 billion) and is still expected to double by 2050 (2.2 billion) and again by 2100 (4 billion). Carbone (2017) then argues that such a demographic pressure will have a substantial effect on global populations and migration dynamics.

The EBA also reveals that youth unemployment and voice and accountability both have a robust negative impact on net migration. The effect of youth unemployment contradicts neoclassical economics as unemployment is supposed to fuel migration. The finding could be explained by the fact that people between 15 and 25

years old often lack the financial means necessary for migration. Besides, at that age, most Africans are still busy acquiring academic and professional qualifications. As for the effect of voice and accountability, it is in line with a priori expectations that countries in which fundamental human rights are respected, free and fair elections are organized, tend to be better off in terms of governance and general wellbeing, thus mitigating the aspirations to move.

Finally, the results reveal that natural resources rents have a robust positive effect on migration. Such an effect could be explained by the fact that in African economies, an important share of the GDP comes from natural resources rents. An increase in those rents could induce an increase in income for the population and consequently, an increase in their capabilities to migrate. Besides, this finding is in line with the resource curse hypothesis as resource-rich African countries are often associated with corrupt and repressive states (Braas, 2008). The policies of those poorly-governed states often fuel economic and social inequalities, environmental disasters, armed conflicts, and international migration.

Refugee populations

The results show that institutional variables (political stability, voice and accountability, rule of law, regulatory quality, government effectiveness, and corruption) have a robust negative effect on refugee populations. This is in line with a priori expectations that a sound institutional framework protects human and property rights, sustains democracy and social justice, and constitutes the foundation upon which everything else is built. Good institutions help prevent the political and socio-economic circumstances leading people to become refugees. The results also reveal that more refugees tend to come from common law countries. This contradicts the idea that common law countries often have better institutions (La Porta et al., 2008) and should therefore be associated with fewer refugees. Nevertheless, such a finding could be due to the fact that the knowledge of the English language facilitates international movements.

In line with the new economics of migration, the results reveal that domestic credit is negatively associated with refugee populations. Indeed, as argued above, market failures such as the limited access to credit incite people to migrate. It is also found that foreign direct investments, external debt, and international tourism have a robust positive impact on refugee populations. This is in line with world systems theory according to which capitalism creates an uprooted population prone to migrate. Paying attention to undernourishment and food production, the EBA reveals that the availability of food is negatively associated with refugee populations. This is corroborated by empirical observations, as areas affected by droughts and other climatic hazards often experience large population outflows.

Supporting the resource curse hypothesis, it is found that natural resources rents and military expenditure have a robust positive effect on refugee populations as those two variables are often associated with armed conflicts. Given that good health

is needed for migration, life expectancy and HIV/AIDS prevalence are found to have a positive and a negative impact on refugee populations respectively. Finally, GDP per capita and youth unemployment are found to have a positive impact on refugee populations. De Haas (2008) argues that increases in income (GDP) improves the capabilities to migrate while Kohnert (2007) and Carbone (2017) argue that the mismatch between the economic expectations of young Africans in terms of employment and wages and the reality of the labor market in their home countries are drivers of migration.

CONCLUSION AND RECOMMENDATIONS

Inspired by an extensive literature (Massey et al., 1993, 1994; Black et al., 2006; Docquier, 2007; Faini, 2007; Kohnert, 2007; Bossard, 2008; Bredeloup, 2013; Duwicquet et al., 2014; Efionayi and Piguet, 2014; Cummings et al., 2015; Carbone, 2017; Press, 2017; Akanbi, 2017) and based on data availability, 27 potential root causes of international migration were selected to cover 30 sub-Saharan countries for the period between 2002 and 2016. The sensitivity and robustness of each determinant of both net migration and refugee population was tested using the EBA approaches proposed by Leamer and Leonard (1983) and Sala-I-Martin (1997).

The results reveal that domestic credit, health expenditure, natural resources rents, youth unemployment, population growth, HIV prevalence, trade, and voice and accountability are robust determinants of net migration while FDI inflows, international tourism, HIV prevalence, corruption, GDP per capita, undernourishment, food production, military expenditure, voice and accountability, domestic credit, natural resources rents, youth unemployment, rule of law, government effectiveness, common law, external debt, life expectancy, and regulatory quality are robust determinants of refugee populations.

These findings call out not only African but also Western policy-makers in several respects. Firstly, in line with world systems theory, it is found that the neoliberal capitalism (FDI inflows, international tourism, and external debt) imposed in Africa by Western colonial powers tends to fuel international migration. Even though trade was found to have a negative impact on migration, one can still argue that the terms of international trade are in disfavor of African producers. For instance, Kohnert (2007) revealed that West African cotton producers would make an additional 250 million U.S. dollars every year if the USA, China, and the EU stopped their unfair subsidies. Furthermore, the acceptance of the resource curse hypothesis reminds us that Western governments often support corrupt and repressive African regimes to have privileged access to some strategic natural resources such as crude oil.

Secondly, talking about corrupt and repressive African regimes, the findings of this paper once more highlight, if need be, the importance of a sound institutional framework. These results are just echoing what US President Obama said before the Ghanaian parliament in 2009: "Africa doesn't need strongmen, it needs strong institutions". African citizens and policy-makers should therefore pay more attention,

put more efforts and allocate more resources to the erection and the consolidation of sound institutions.

Thirdly, paying attention to health-related variables, one cannot overlook the fact that healthcare systems in Africa are particularly affected by the structural demand for nurses and doctors in Western countries. This brain drain and its direct adverse effects on public health are well documented (Black et al., 2006; Docquier, 2007; Faini, 2007; Bourgain et al., 2010). African authorities should therefore implement policies to limit this outflow of qualified workers. For instance, they could legislate for a compulsory minimum serving period during which accredited health professionals will not be allowed to work abroad. Furthermore, similar measures should be implemented in some other strategic sectors such as higher education or justice because the brain drain is associated with additional disruptions delaying the development of a middle class as well as that of a sustainable civil society in Africa (Kohnert, 2007).

In fine, one should keep in mind that the analyses developed in this paper are essentially built upon macro-level and meso-level variables while there are micro-level determinants of international migration. Indeed, as revealed by Carbone (2017), migration is not only a passive human response to external pull and push factors, but it is also a decision governed by individual characteristics such as perception, personality traits, aspirations, etc. Thus, future research on the causes of international migration in sub-Saharan Africa should pay more attention to micro-level data.

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