

SHORT-RUN AND LONG-RUN EFFECTS OF CONFLICTS ON FOREIGN DIRECT INVESTMENT: CASE OF SUB-SAHARAN AFRICAN COUNTRIES

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This paper aims to investigate the relationship between foreign direct investment (FDI) and conflicts in Sub-Saharan Africa countries over the period 1996–2016. To examine the short-run and long-run dynamics the study employs a combined ARDL panel approach. This model based on three alternative estimators such as mean group estimator (MG), pooled mean group (PMG) and dynamic fixed effects (DFE). The main results reveal that there is a significant relationship between FDI and conflicts in the long-run but not in the short-run in Sub-Saharan African countries. The findings suggest that, if SSA countries succeed in resolving conflicts, this would create a favorable climate for institutional reform and benefit from FDI. This, in turn, would enable these countries to improve economic growth and reduce extreme poverty.

Keywords: Foreign Direct Investment; Conflicts; Sub-Saharan Africa, Panel ARDL.

JEL classification : F21, C33, O47, D74

Introduction

As the world economy is becoming more and more liberalized, foreign direct investment is gaining a fundamental economic development role country-wise. Experts now strongly believe that FDI firmly stand as leverage behind the growth of developing economies. For this reason, many developing countries started to consider implementing appropriate mechanisms that would promote the attraction of FDI. Accordingly, studies focusing on the factors that affect the attraction of FDI grew in number and scope. Many of these studies focused on the socio-political, economic and institutional factors that affect FDI. Of these mechanisms, combatting corruption and terrorism, decreasing internal and external conflicts, civil wars and frictions and maintaining social and political stability are the main headlines to attract different investors to a variety of market niches.

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Before engaging in an FDI adventure, a firm has to consider basic questions such as how much to invest and where? Panel data-based studies indicate that firms usually opt for countries with an ideal economic and business climate, supported by encouraging policies, a sizeable market for their products and growth potential and above all for countries devoid of political or instability risks (Agodo, 1978).

Violent conflicts may ultimately reallocate productive capital and FDI elsewhere. Even though there is little consensus on how to best empirically measure conflict, the literature on the effects of violent conflicts stresses that political, social and economic instability inevitably reduces the attractiveness of a country to investors. Then, under the right circumstances, FDIs are known to play a major role in promoting economic growth in developing and less-developed countries as they help increase domestic capital, contribute to the transfer of new technologies and skills, establish large-scale industries and eventually promote productivity growth (see Rahman & Gangopadhyay, 2011).

In developing countries, the same literature stresses as well that FDI facilitate economic growth potentials. Borensztein et al. (1998) for instance argue that FDI promote the transfer of technology from developed to developing countries. Such a transfer is likely to generate more economic growth as domestic investment is often insufficient to create the desired outcomes. However, when countries suffer from social and political unrest, civil and international conflicts, the growth rate will dramatically fall down as the will to invest is discouraged. Inversely, this will dislocate financial, physical, and human capital to safer havens (Collier, 1999). The results of such reallocation of capital are often devastating: unemployment, poverty, uncertainty, and the threat of civil war (Collier and Hoeffler, 1998). The Sub-Saharan African (SSA) context is no exception to this. Historically, such developing countries usually find difficulties laying down the ground for a conflict-free environment.

As from the late 1990s, research on FDI, on the one hand, and political risk and institutional quality, on the other, has continued to gain momentum. Such research concluded to the negative relationship between institutional uncertainty and private investment (Brunetti and Weder; 1998), between FDI and corruption (Wei; 2000). Therefore, others pointed to the positive impact of intellectual property protection on FDI inflows (see eg. Lee and Mansfield; 1996). As far as democracy is concerned, the literature reached mixed results. Harms and Ursprung (2002) and Busse (2004), for instance, found that foreign investors prefer high democratic countries whereas Li and Resnick (2003) reach the opposite conclusion.

Moreover, several other studies examined the impact of armed conflicts on business and investments in developing countries. For instance, Gaibulloev and Sandler, (2011) and Nitsch and Schumacher, (2004) among others, found that terrorism has a disastrous effect on domestic economies. Similarly, other researchers reveal that investors and recipient states agree that military conflicts and terrorism are more likely to discourage bilateral investment (Li and Vashchilko, 2010), and that various forms of terrorism negatively affect FDI (Bandyopadhyay et al., 2014), tourism (Bilson et al., 2012; Drakos and Kutan, 2003), mineral and non-mineral resources (Ashby and Ramos, 2013), and bilateral trade (Oetzel et al., 2007; Nitsch and Schumacher, 2004).

Bearing on the above, the present study aims to contribute to the literature on FDI in two ways. Firstly, we focus on the SSA countries which have the same socio-economic and political conditions. In fact, many studies have mentioned that FDI has varying influences and has been more efficient in some regions than others (Adams, 2009). Secondly, we use the panel ARDL approach which allows controlling the heterogeneity in the dynamics of variables in the short and long run.

The rest of the paper is structured as follows: Section 2 reviews the relevant literature. Section 3 describes the econometric specifications and data sources. Section 4 presents and interprets the results. Section 5 concludes the study.

Literature review

Foreign direct investment and economic growth

Research on FDI stressed their crucial importance and multiple benefits to economic growth for both developed and developing countries. For instance, Iamsiraroj and Ulubaşoğlu, (2015), Chowdhury and Mavrotas, (2006) and Choe, (2003) highlight their potential to boost economic activities and stimulate growth. Accordingly, developing countries resort to FDIs to meet their desired gross investment and support their growth targets. These countries strive to supplement domestic investment with FDIs because the possibility to generate sufficient domestic-based savings can be unstable (Asiedu, 2002; Mbulawa and Mehta, 2016).

However, research on FDI reached mixed and sometimes conflicting results. While some authors, like Nwosa et al. (2011), Saibu et al., (2011), Awe, (2013), Saqib., (2013) and Antwi et al., (2013), found evidence that points to the positive effect of FDI on economic growth, others, like Osinubi and Amaonyeodiwe, (2010), Oyatoye et al., (2011), Ahmad et al., (2012), Babalola et al., (2012) and Hassen and Anis, (2012), conclude to a negative effect. Balasubramanyam et al (1996), for example, using cross-section data and OLS regressions, found that FDI inflows are positive to the economic growth of recipient countries. The authors highlight, however, that in order to achieve such productive outcomes, export promotion strategies rather than import substitution strategies, have to be given priority.

Considering the many advantages of FDI, a number of African developing economies started adopting various macroeconomic reforms in view of encouraging FDI inflows (Ajide & Raheem, 2016). However, unlike Asian and Latin American developing economies, African countries have not been quite successful in attracting substantial FDI inflows (Asiedu, 2002). Sub-Saharan Africa (SSA), for instance, has only succeeded in attracting less than 3% of worldwide FDI in the last four decades. Such poor portions led Ferreira and Ferreira (2016) to conclude that SSA is sidelined in the global FDI inflows.

Moreover, Gaibullov and Sandler (2011), using a fixed-effects panel estimation technique, studied a data set of 51 African countries observed during the 1970 to 2007 period to examine the negative effects of domestic and transnational terrorism on economic growth. The authors concluded that while transnational terrorism had a significant impact

on income per capita growth, domestic terrorist events did not. Moreover, Bandyopadhyay et al. (2014) examined data from 78 developing countries covering the 1984-2008 period and found that the intensity of aggregate aid in the case of domestic terrorism and bilateral aid in the case of transnational terrorism mitigates the negative impact on FDI.

Furthermore, Asidu (2002) studied the determinants of FDI in a sample of 71 developing countries, 32 of which are SSA countries, observed between 1988 and 1997. The author found that infrastructure development, trade openness, and a return to capital have tremendous positive effects on the ratio of net FDI flows to GDP. To study this relationship in SSA countries, the author included a dummy variable and found that sub-Saharan African countries attract less FDI than other developing countries because of political instability. Additionally, Hajzler (2014) and Osabutey and Okoro (2015) found that political risk, as operationalized by corruption expropriation and war, was a significant obstacle to attracting FDI to developing countries. It can be concluded that terrorism and political risk have a deteriorating impact on FDI. Moreover, political uncertainty and its effect on FDI inflows also depend on institutional efficiency. In this regard, Julio and Yook (2016) found that less variation in FDI is observed in countries with higher institutional efficiency. Similarly, Kim (2016) argued that political conflicts pose serious long-lasting risks for foreign investors whose willingness to invest will decline as conflicts persist.

Internal, external conflicts and FDI

Political stability is a multi-dimensional construct. In this regard, the World Bank (1996) defined the political stability as the government's stability and the absence of politically-motivated violence and terrorism. Additionally, political stability denotes a situation where citizens behave in line with established political standards. Accordingly, absence of such an atmosphere entails a threat to stability, where political instability prevails. Then, conflicts between political actors may lead to violence, shaking off the political system. Relevant research asserts that a set of criteria is required in order to attract foreign direct investors. In addition to political stability, absence of internal and external conflicts, low corruption levels, absence of bureaucracy, efficiency, trade liberalization and friendly business environments should be installed (see Gangopadhyay, 2007).

Agodo (1978) reported the link between political stability and FDI. His study was based on a sample of 33 U.S. firms having 46 manufacturing investments in 20 African countries. The results showed that there is no single factor that determines solely the U.S. private manufacturing investment in Africa and one of the most important factors correlated with the decisions to undertake and the level of U.S. manufacturing investment is the political stability. Gani (2007) examined a sample of Asian and Latin American countries and concluded that control of corruption, rule of law, regulatory quality, government efficiency, and political stability positively correlate with FDI inflows. Similarly, Busse and Groizard (2008) found that governance indicators in Latin America negatively affected the attractiveness of FDI.

In addition, a corollary to political instability is terrorism. According to Enders et al. (2006), terrorism aims at spreading fear among citizens and at disrupting normal life activities to achieve political and economic objectives. Recently, terrorist activities have seriously affected investment, economic activities and growth in politically-unstable countries like Mali, Nigeria, D.R of Congo, South Sudan and Somalia, to name but few. However, for FDI inflows to thrive in the host countries, a friendly safe environment is a requirement (Gani and Al-Abri, 2013). Then, political instability, uncertainty and other risk forms tend to damage potential growth as they discourage foreign investment. Investors seek security and stability.

In the literature, the study of the relationship between political stability and FDI goes back to Basi (1966). This study is among the leading contributors to determine the role of political stability in attracting FDI inflows. However, more recent studies used different analytical approaches and found contradictory results. Some researchers, in particular Mijiyawa (2015), Burger et al (2015), Al-Khouri (2015), Sagarik (2015), Rauf and Mehmood (2016), Ajide and Raheem (2016), Ferreira and Ferreira (2016), Rashid et al (2017), argued that in many countries, political stability does encourage FDI inflows. However, another group of researchers, like Holmes, et al. (2013), Lucke and Eichler (2016), Yang et al. (2018), suggested that political stability deters FDI inflows. Still, a third group of researchers, often referred to as the neutral group, whose proponents include Gani and Al-Abri (2013), Okafor (2015), Kurul and Yalta (2017), asserted that there is no significant relationship between political stability and FDIs in several contexts.

Moreover, Al- Khouri (2015) used a GMM model for 16 MENA economies between 1984 and 2012 in order to determine the factors affecting FDI inflows. Likewise, using the same model, Ajide and Raheem (2016) investigated the role of institutions in attracting FDI inflows to the Economic Community of West African States (ECOWAS) during the 2000-2013 period. Both studies found that stability of the political system positively correlates with FDI inflows and that internal conflict deters foreign investors. However, Ajide and Raheem (2016) failed to validate this relationship in sectors like manufacturing services and extractive industries.

Furthermore, Ezeoha and Ugwu (2015) used a GMM model to explore the interactive effect of political stability and armed conflict on FDI inflows in 41 selected African countries during the 1997-2012 period. The same model is also used by Mijiyawa (2015) to investigate the same relationship in 53 African countries observed during the 1970-2009 period. The results were similar, affirming the positive impact of a stable political environment on FDI inflow in Africa. Nonetheless, both studies did not provide deep insight into the relationship between political stability with different components of FDIs such as Greenfield investment, mergers and acquisitions. Had such information been provided, it would have enhanced a better understanding of the dynamics of FDI inflows in African countries with fragile institutional frameworks.

In addition, Goswami and Haider (2014) argued that political risk arising from ethnic tensions and internal conflicts discourage FDI inflows. They examined 146 developing economies during the 1984-2009 period, using OLS and FEM techniques. Furthermore,

they included a sizeable number of developing economies observed during a study period stretching over 26 years, yet they did not consider income ranges as well as regional heterogeneity in these countries.

Empirical methodology and data

Methodology

To study the effects of conflicts on FDI, this paper uses a panel ARDL model. This method is interesting for many reasons. Firstly, it enables us to control for heterogeneity in the link between conflicts and FDI within countries by adding individual-specific effects. Secondly, it permits us to control for endogeneity. According to Phillips and Hansen (1990) and Johansen (1995), the long run links are only possible when variables have the same order of integration. Thirdly, the panel ARDL proposed by Pesaran et al. (1999) may be employed with variables with different orders of integration regardless of whether they are I(0) and I(1), I(0) or I(1). Fourthly, it enables us to estimate simultaneously both the short run and the long run effects of internal and external conflicts on FDI.

To examine the long-run effect of conflicts on FDI, it is common to estimate the following (static) cross-sectional regression:

$$FDI_{it} = \alpha_0 + \alpha_1 GDP_{it} + \alpha_2 PV_{it} + \alpha_3 ICONF_{it} + \alpha_4 ECONF_{it} + \varepsilon_{it} \quad (1)$$

Where FDI_{it} is the foreign Direct Investment net inflows (% of GDP) for country i at date t , GDP_{it} is the real GDP per capita in 2011US\$, PV_{it} is political stability and absence of violence, $ICONF_{it}$ is Internal Conflict, $ECONF_{it}$ is external conflict and $\hat{\alpha}_{it}$ is error term.

Traditional estimation methods cannot adjust variables to short-run and long-run equilibrium. In a panel data specification, Equation (1) is nested in an ARDL specification to allow for rich dynamics in the way that FDI adjusts to the level of sensitivity of political risks and other explanatory variables. This model seems fit to control heterogeneity in the relationship between variables integrating the individual specific effects. Like Pesaran and Shin (1996), the ARDL (p, q, \dots, q) model where the independent and dependent variables enter the right-hand side with lags of order p and q is specified as follows:

$$Y_{it} = \vartheta_i + \sum_{j=1}^p \varphi_{i,j} Y_{i,t-j} + \sum_{j=0}^q \delta'_{i,j} X_{i,t-j} + \varepsilon_{it} \quad (2)$$

With $t = 1, 2, \dots, T$ is a time index; $i = 1, 2, \dots, N$ is the number of countries; j is the number of time lags; $Y_{it} = FDI_{it}$, $X_{i,t}$ is the vector of the variables representing PV_{it} , $ICONF_{it}$, $ECONF_{it}$ and GDP_{it} and ϑ_i is the specific fixed effect of countries.

To consider the adjustment coefficient and the long-term dynamics, Equation (2) is re-parameterized as follows:

$$\Delta Y_{it} = \vartheta_i + \varnothing_i Y_{i,t-1} + \alpha'_i X_{i,t} + \sum_{j=1}^{p-1} \varphi^*_{i,j} \Delta Y_{i,t-j} + \sum_{j=0}^q \delta^*_{i,j} \Delta X_{i,t-j} + \varepsilon_{it} \quad (3)$$

Where

$t = 1, 2, \dots, T$ and $i = 1, 2, \dots, N$

$$\varnothing_i = -\left(1 - \sum_{j=1}^p \varphi_{i,j}\right); \quad \infty_i = \sum_{j=0}^q \delta_{i,j} ;$$

$$\varphi_{i,j}^* = - \sum_{m=j+1}^p \varphi_{i,m} \quad j=1; 2; \dots; p-1 \text{ and}$$

$$\delta_{i,j}^* = - \sum_{m=j+1}^q \delta_{i,m} \quad j=1; 2; \dots; q-1$$

By grouping the variables in levels further, equation (3) is rewritten as follows:

$$\Delta Y_{it} = \vartheta_i + \varnothing_i (Y_{i,t-1} - \theta_i X_{i,t}) + \sum_{j=1}^{p-1} \varphi_{i,j}^* \Delta Y_{i,t-j} + \sum_{j=0}^{q-1} \delta_{i,j}^* \Delta X_{i,t-j} + \varepsilon_{it} \quad (4)$$

Where, \varnothing_i is the adjustment coefficient of the long-run dynamics; $\theta_i = -(\infty_i / \varnothing_i)$ indicates the long-run equilibrium relationship between $Y_{i,t}$ and $X_{i,t}$; $\varphi'_{i,j}$ and $\delta'_{i,j}$ represent the short-term coefficients linking foreign direct investment with its past values and the variables of interest $X_{i,t}$. There is a long-run relationship between FDI and conflicts if \varnothing_i is negative and significant, then a co-integration relationship exists between $Y_{i,t}$ and $X_{i,t}$. To estimate equation (4), three estimation methods will be used; the mean group (MG) developed by Pesaran and Smith (1995), the pooled mean group (PMG) developed by Pesaran et al (1999) and the dynamic fixed effect estimator (DFE).

The main characteristic of PMG is that it estimates short-run coefficients, including the intercepts and adjustment speed to the long-run equilibrium. While the short-run coefficients insure error variances to be homogenous country by country, the long-run slope coefficients are restricted to be homogeneous across countries. This is particularly useful where there are reasons to accept that the long-run equilibrium relationship between the variables is similar across countries or, at least, a sub-set of them. Short-run adjustment can be country-specific, because of the widely different effects of financial crises and external shocks, stabilization policy, and monetary policy among others. However, several assumptions should be met for the validity, consistency and efficiency of this methodology.

The MG technique introduced by Pesaran and Smith (1995) aims at estimating separate regressions for each country and calculating the coefficients as invariant means of the estimated coefficients for each country. This does not impose any restrictions. It allows for all coefficients to vary and be heterogeneous in the long and short-run. However, of the necessary requirements for the consistency and validity of this approach is that the data should have a sufficiently large time series dimension.

The dynamic fixed effect estimator (DFE) is very similar to the PMG and imposes restrictions on the slope coefficient and error variances to be equal across all countries in the long-run. The DFE model further restricts adjustment speed coefficient and the short-run coefficient to be equal too. However, the model features country-specific intercepts. The DFE has a cluster option to estimate intra-group correlation with the standard error (Blackburne and Frank, 2007).

Data

The main aim of this study is to determine the short-run and the long-run effect of internal conflicts, external conflicts on foreign direct investment in a global sample of 28 Sub-Saharan African countries. The list related to the countries is mentioned in Table 1. The study period spans from 1996 to 2016. The foreign Direct Investment net inflows (% of GDP) real GDP per capita data are from the International Monetary Fund and World Bank database. The data of internal and external conflicts are sourced from the International Country Risk Guide (ICRG) of the Political Risk Service group (Howell, L.D, 2011). Internal conflict is an indicator of the country's political violence and its real or possible effect on governance. There are three subcomponents to measure the degree of risk such as civil Disorder, civil War/coup threat and terrorism/political violence. As risk levels increase, so does the country embroiled in an on-going civil war. With regard to external conflict, this is an assessment of the impact of foreign intervention to the incumbent government in the country. The level assigned to the risk is the sum of three subcomponents such as cross border conflict, war and foreign Pressures. In fact, violent external pressure and non-violent external pressure can negatively affect foreign business in different ways namely distortions in the allocation of resources, restrictions on operations to trade and investment sanctions and an aggressive changes in the social structure (Howell, L.D, 2011). The data of Political stability and the absence of violence are sourced from the Worldwide Governance Indicators (WGI) provided by the World Bank (Kaufman et al, 2011).

Table 1. List of Countries

Angola	Ethiopia	Guinea-Bissau	Mozambique	Senegal	Zambia,
Burkina Faso	Gabon	Kenya	Malawi	Sierra Leone	Zimbabwe
Botswana	Ghana	Liberia	Namibia	Togo	Ivory Coast
Cameron	Guinea	Madagascar	Niger	Tanzania	
D.R of Congo	Gambia	Mali	Nigeria	Uganda	

4. Empirical findings

4.1. Stationarity tests

Before proceeding with the estimation of the panel ARDL model, it is necessary to study the stationarity of the variables for all countries. If the series are stationary in level ($I(0)$), then the VAR model is estimated and the dynamics are in the short-term. However, when the series are mixed ($I(0)$ and $I(1)$) or they are ($I(1)$), then the Panel ARDL model is estimated considering the series in level (see Gangopadhyay et al., 2022).

For this purpose, we have tested the stationarity for each variable by using four types of unit roots tests. Firstly, to investigate the Panel data unit root assumption, Im and al. (1997) suggest a t-bar statistic formed by an average of the individual ADF statistics. According to these authors, the t-bar statistic, which takes into account residual heterogeneity and serial correlation through groups, has a more specific size and higher strength than Levin and Lim's (1993) data Panel unit root test. Secondly, Maddala and Wu (1999) propose the

Table 2. Stationarity for each variable.

Variables	Fisher-type tests						IPS test			Hadri-LM			
	Fisher-ADF statistic			Fisher-PP statistic			t-tilde-bar	Z-t-tilde-bar	W-t-bar				
	P	Z	L*	Pm	P	Z					L*	Pm	
FDI (p-value)	241.2812* (0.0000)	-11.2427* (0.0000)	-12.4930* (0.0000)	17.5074* (0.0000)	40.8744 (0.8400)	7.1380 (1.0000)	9.6830 (0.6800)	10.4690 (1.0000)	-2.9515 (0.0000)	-2.3159 (0.0000)	-6.2771 (0.0000)	-6.8939 (0.0000)	6.7800* (0.0000)
DFDI (p-value)					240.8740 (0.0000)	-9.1710 (0.0000)	-11.7822 (0.0000)	17.4158 (0.0000)	-2.9515 (0.0000)	-2.3159 (0.0000)	-6.2771 (0.0000)	-6.8939 (0.0000)	6.7800* (0.0000)
GDP (p-value)	89.6936* (0.0028)	-1.8322** (0.0335)	-2.0254** (0.0223)	3.1838* (0.0007)	38.0982 (0.9679)	5.8144 (1.0000)	6.2527 (1.0000)	-1.6916 (0.9546)	-0.2780 (1.0000)	-0.2221 (1.0000)	8.0820 (1.0000)	5.6493 (1.0000)	12.5963* (0.0000)
DGDP (p-value)					462.4723 (0.0000)	-16.3813 (0.0000)	-24.0496 (0.0000)	38.4080 (0.0000)	-4.2070 (0.0000)	-2.8860 (0.0000)	-10.2538 (0.0000)	-11.9197 (0.0000)	
PV (p-value)	171.7533 (0.0000)	-8.2635 (0.0000)	-8.5849 (0.0000)	10.9377 (0.0000)	73.8611 (0.0551)***	-0.8605 (0.1947)	-1.1576 (0.1245)	1.6877 (0.0457)	-1.6257 (0.3090)	-1.4733 (0.3090)	-0.4986 (0.3090)	-2.9195 (0.0018)	8.8637 (0.0000)
DPV (p-value)					462.0633 (0.0000)	-17.5564 (0.0000)	-24.1411 (0.0000)	38.3694 (0.0000)	-4.3043 (0.0000)	-3.0146 (0.0000)	-11.1387 (0.0000)	-13.5984 (0.0000)	
Ecomf (p-value)	296.5908 (0.0000)	-11.9827 (0.0000)	-14.9465 (0.0000)	22.7337 (0.0000)	113.6735 (0.0000)	-4.2515 (0.0000)	-4.4122 (0.0000)	5.4496 (0.0000)	-1.8665 (0.0401)	-1.6556 (0.0401)	-1.7490 (0.0401)	-6.8784 (0.0000)	4.6251 (0.0000)
Icomf (p-value)	262.2764 (0.0000)	-12.1285 (0.0000)	-13.6345 (0.0000)	19.4913 (0.0000)	134.9447 (0.0000)	-5.8136 (0.0000)	-6.1554 (0.0000)	7.4596 (0.0000)	-2.3913 (0.0000)	-2.0730 (0.0000)	-4.6109 (0.0000)	-9.6450 (0.0000)	5.7436 (0.0000)

Notes: The t-tilde-bar ($\bar{t} - \text{bar}_{NT}$) statistic is similar to the t-bar ($t - \text{bar}_{NT}$), statistic except a different error variance estimator of the Dickey-Fuller regression is used. A standardised version of the statistic t-tilde-bar is $-\bar{t} - \text{ttilde} - \text{bar}(Z_i - \text{bar})$. In presence of serial correlation, Dickey-Fuller regression is augmented as follow: $\Delta y_{it} = \phi_i y_{i,t-1} + z_{it} \gamma + \sum_{j=1}^p \Delta y_{i,t-j} + \int_{i,t}$ where p is the number of lags. Im et al. (2003) propose thus another statistic noted $W_{t-\text{bar}}$ which follows an asymptotical standard normal distribution when $T \rightarrow \infty$ followed by $N \rightarrow \infty$. Adenotes the first difference for each variable.

Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) Chi-Square. These tests are based on the combination of individual tests according to Fisher's suggestion Fisher (1932). Maddala and Wu (1999) proposed to combine the p-values P_i from the individual (ADF) unit root test applied to cross-section unit i . Finally, Hadri (2000) suggests a Lagrange Multiplier (LM) method to test the null hypothesis that all the individual series in the panel are stationary against the alternative of at least one unit root. The Hadri-LM tests are based on a simple average of the univariate stationarity test in Kwiatkowski et al (1992), which after a suitable standardization follows a standard normal distribution.

Table 2 below shows the results of the stationarity tests, namely the ADF, PP, IPS and Hadri-LM tests. The findings indicate that the two series (Econf and Iconf) are stationary in level. However, real GDP per capita, FDI and political stability (PV) are stationary in the first difference. Then, the Panel ARDL model can be used.

4.2. The optimal lag selection

This study tries to determine the optimal lag number of the ARDL model (p, q, q, q, q). Subsequently, it tries to interpret the results of the different estimators, namely the MG, the PMG and the DFE. The optimal lags for the global sample of countries are reported in Table 3. The most common lags between countries are chosen. Specifically, the most frequent number for all countries and for each variable used is chosen referring to the SBIC criterion.

Brooks (2002) indicates that there are two ways to choose the optimal lag. The first is based on daily data and high-frequency (intraday) data. However, in this case the optimal lag choice is not evident. The second applies the information criteria. In fact, there are three most popular information criteria: Akaike's (1974) information criterion (AIC), Schwarz's (1978) Bayesian information criterion (SBIC) and the Hannan-Quinn's (1979) information criterion (HQIC). In our empirical research, we adopt the SBIC criteria to determine the optimal lag length because it requires a more severe penalty AIC criterion. The ARDL (2, 2, 2, 2, 2) is chosen for all countries.

Table3 The optimal lag selection.

Variables	FDI	GDP	PV	ECONF	ICONF
	ARDL (p, q, q, q, q)				
Countries					
Angola	2	0	1	2	2
Burkina Faso	2	2	2	2	1
Botswana	2	2	2	2	2
Cameroon	2	1	2	0	1
Democratic Republic of Congo	1	1	2	2	1
Ethiopia	2	2	2	2	2
Gabon	2	1	2	2	0
Ghana	2	1	2	2	1

Variables	FDI	GDP	PV	ECONF	ICONF
	ARDL (p, q, q, q, q)				
Guinea	2	1	2	1	0
Gambia	2	2	2	2	2
Guinea-Bissau	1	0	2	2	2
Kenya	2	2	2	2	1
Liberia	1	1	2	2	2
Madagascar	2	1	0	1	1
Mali	2	2	2	2	2
Mozambique	1	1	0	2	1
Malawi	2	2	2	2	2
Namibia	1	2	0	2	0
Niger	2	2	2	2	2
Nigeria	2	2	0	2	2
Senegal	2	1	1	0	2
Sierra Leone	2	0	2	1	1
Togo	2	2	2	2	1
Tanzania	1	1	0	0	1
Uganda	1	1	2	2	0
Zambia	2	2	2	2	1
Zimbabwe	1	2	0	1	2
Ivory Coast	1	2	2	2	0

4.3. The Panel ARDL results

Table 4 reports the results of the short-run and long-run effects of economic growth, internal conflicts and external conflicts on foreign direct investment using the three estimators MG, PMG and DFE.

For the 28 countries, the results confirm the presence of a long-run relationship since the adjustment coefficient (error correction parameter) is negative and statistically significant at the 1%. The Hausman test makes it possible to check the homogeneity hypothesis of the long-run coefficients. Then, the PMG estimator is more consistent and more efficient. Indeed, the Hausman test allows for choosing between the MG and PMG, on the one hand, and between the PMG and the DFE, on the other. This test is found to be statically insignificant. Therefore, the PMG estimator is selected as it allows for determining the long-run effects because the Hausman test is not significant between MG and PMG and between PMG and DFE.

Table 4 presents the results of the PMG using ARDL (2, 2, 2, 2, 2). The results show the long-run and short-run coefficients between FDI, economic growth and conflicts and adjustment speed. In the long run, the results show that there are four variables, real GDP per capita, political stability, internal conflict and external conflicts, are positively and statistically significance at the 1% and 10% levels in influencing FDI inflows.

For the overall sample, even if, in the short run, political stability (PV) does negatively affect FDIs and the effect is not significant, in the long run, the effect is significant. This result implies that a 1% decrease in PV leads to a 3.6896 % increase in FDIs. On the other hand, even if, in the short run, external conflict affects negatively and insignificantly FDIs, the effect is positive and significant in the long run. These findings imply that in the short run, a 1% decrease in external conflicts results in a 0.4237% increase in FDIs. In addition, the results suggest that the effect of internal conflicts is insignificant in the short run, however, it is significant in the long-run.

Table 4. MG, PMG and DFE estimators: empirical results.

	MG	PMG	DFE
Long run coefficients			
Δ GDP	-0.0963 (0.3840)	0.0010* (0.0000)	0.0662 (0.9050)
Δ PV	33.6197 (0.4500)	3.6896* (0.0000)	180.6382 (0.9040)
Δ ECONF	-6.7284 (0.5720)	0.4237* (0.0070)	124.7578 (0.9050)
Δ ICONF	9.5441 (0.2560)	0.2676*** (0.0920)	-22.1399 (0.9110)
Hausman test		0.25 (0.99)	0.08 (1.00)
ECT	-0.2205***	-0.3615**	-0.6042***
Phi	(0.0910)	(0.0420)	(0.0590)
Short un coefficients			
GDP	-0.0028 (0.6910)	0.0005 (0.9920)	-0.0005 (0.3340)
PV	-2.4677 (0.3240)	-0.5693 (0.5620)	-1.5070 (0.2820)
ECONF	-1.4159 (0.2080)	-0.2956 (0.6070)	-0.5433 (0.3170)
ICONF	0.0403 (0.9530)	-0.3245 (0.2360)	-0.5743 (0.1640)
Constante	50.6397 (0.3220)	5.3496* (0.0000)	9.6318** (0.0450)
Observations	588		

Note: *, ** and *** indicates the significance at 1%, 5% and 10%. Number in () indicates the p-value.

ECT: indicates the error correction term.

Ddenotes the first difference for each variable

4.4. Causality test

Many studies have committed to investigating causal linkages between FDI and their potential determinants. This paper has also examined the causality relationship between variables using the Fisher test. It is widely discussed that possible linkages between FDI, conflicts and GDP could be fall into one of the following categories: 1) a causal relationship from FDI to GDP (FDI to conflicts); 2) a causal relationship from GDP to FDI (FDI to conflicts); 3) a feedback relationship between FDI, conflicts and GDP; and 4) no causal relationship (neutrality) between FDI and GDP (FDI to conflicts). The Granger causality statistical results are reported in Table 5. The results show that GDP has no significant impact on FDI. The most probable reason for this result seems to be that average economic growth in SSA countries is lower than the level of economic growth necessary to have a positive influence on FDI. Although some of the SSA countries in the panel have shown higher growth performance than other low-income countries, their growth looks to be lower than the world average. Moreover, some of these countries need stronger growth determinants such as the quality of human capital, governance, infrastructure, legal framework, ICT and tax system, macroeconomic stability, and political stability in order to attract FDI. However, the results confirm the existence of unidirectional causality between internal conflicts and FDI and external conflicts and FDI in selected panel. Our findings clearly indicate the need for further individual country examinations on the above link, as causality between the two factors varies by nation. Indeed, empirical studies in this area, based on causality testing across a panel of countries, reveals that the causal link between FDI and growth is marked by a considerable degree of heterogeneity.

Table 5. Granger causality analysis

Variables	F-statistics	significativity	Direction of causality
FDI/GDP	0.2814	0.7548	Absence
GDP/FDI	0.8111	0.4449	Absence
PV/FDI	0.3318	0.7177	Absence
FDI/PV	1.1485	0.3179	Absence
FDI/ICONF	2.3925	0.0924	Unidirectional
ICONF/FDI	0.4590	0.6322	Absence
FDI/ECONF	4.1224	0.0167	Unidirectional
ECONF/FDI	1.2355	0.2915	Absence

5. Conclusion

The main objective of this study is to examine the interaction between economic growth, political stability, internal conflicts, external conflicts and foreign direct investment. It applied the Panel ARDL model to determine the short-run and long-run effects for each variable on FDIs. It examined a panel of 28 Sub-Saharan African countries during a period spanning from 1996 to 2016. The results confirm the presence of a long-run relationship because the adjustment coefficient (error correction parameter) is negative and statistically

significant. The PMG estimator is found to be more consistent and more efficient. In the short run, the effect is not significant, however, it is positive and significant in the long-run. Bearing on these findings, policy-makers can promote FDI inflows to sub-Saharan African countries by improving their institutional quality through boosting political stability and reducing internal and external conflicts in the long-run. In the short-run, all institutional variables are not statistically significant in influencing FDI inflows. This finding should attract the attention of foreign investors to the importance of institutional variables to FDI in the long-run.

As stressed in the literature, political stability is a complex component crucial to attract FDI inflows. Issues like conflicts, civil war, terrorism, corruption, social, economic and political unrest, i.e. political instability, have a harmful effect on FDI inflows and hinder economic growth. Such events have short and long-term effects. More research has to be conducted to consider and determine these effects. If the negative effects are hardly noticeable in the short-run because governments seek different ways to avoid bankruptcy, like reforms, loans from the World Bank and the IMF, yet these effects are dreadful in the long-run as developing countries would enjoy cheap debts in the short-run and suffer more serious complications and crises in the long-run. The issue of political stability is a rich field that should lend itself to more academic research in order to determine the basic ills and find the appropriate solutions. An extension to this research study is to split the sample into resource-rich countries and resource-poor countries. The former may be prone to conflict and attractive to foreign investors in some activities. Using the time-series methodology to determine causality for a large group of SSA countries may offer us more robust conclusions about policy guidelines in this important study field. This remains an important challenge for future research.

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