Four Essays on International Finance and Economic Growth in Africa

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This is to certify that the dissertation prepared by Addis Yimer, entitled "Four Essays on International Finance and Economic Growth in Africa" and submitted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy in Economics complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

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Dedication

For the very best of me: My mother Birtukan Getachew

&

My father Yimer Gebregziabhear

Out of this piece, half is yours and half is mine. What is yours is mine and what is mine is yours. Therfore, the whole is yours!

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$\mathbf{I}$ntroduction[1]

1. Background of the Dissertation

Due to a shortage of domestic financing available from domestic saving, economic growth in most African countries is constrained by low levels of domestic investment (Geda and Yimer, 2017). Foreign direct investment (FDI) inflows to African economies can play a critical role by filling not only the savings gap but also the foreign exchange and tax revenue gaps in these countries (Quazi, 2007). By providing investment financing, FDI supports economic growth in the recipient economies (Dupasquier and Osakwe, 2006; Anyanwu, 2012; Calderón and Nguyen, 2015) and facilitates the transfer of technology (Borensztein et al., 1998; Kose et al., 2010) and managerial know-how, thereby supporting Africa's development efforts (Kose et al., 2010; Calderón and Nguyen 2015).

The volume of FDI inflows to African countries has increased substantially, especially after the financial crisis of 2008. For instance, the total FDI inflow to Africa reached a value of US$ 59 billion in 2016, which is more than a fivefold increase from US$ 11 billion in the year 2000. In the year 2000, Africa's share of global FDI inflows was only 0.8 percent. This has increased overtime, albeit inconsistently, to reach a share of nearly 4 percent in 2016 (UNCTAD, 2017). However, Africa is still marginalized in the global distribution of FDI inflows, which are highly skewed toward favoring developed economies and developing Asian countries (see UNCTAD, 2017). For instance, the developed economies of the world received nearly 60 percent of the global FDI inflows in the year 2016. The total share of global FDI flows going to developing countries was around 37 percent in the same year. Developing Asian countries received 25 percent of the global FDI inflows and 70 percent of the total FDI inflows to developing economies in the year 2016. Africa's share in the total FDI inflows to developing economies was only around 9 percent in the same year (see UNCTAD, 2017).

On the other hand, capital flight from the continent has a negative effect on the economy of African countries (Ndikumana and Boyce, 2011; Geda and Yimer, 2017). Capital flight adversely affects economic growth and development of an economy by reducing the amount of investment resources available to a country (Deppler and Williamson, 1987). Empirical evidence on Africa indicates a similar negative effect of capital flight on economic growth through its dwindling effect on investment and loss of foreign exchange (see, e.g., Fofack and Ndikumana, 2010; AfDB et al., 2012; Weeks, 2015; Geda and Yimer, 2017). Over the period 1970-2010, it is estimated that Africa lost around US$ 1.3 trillion due to capital flight (Ndikumana and Boyce, 2011). What is even more concerning is that the problem is increasing overtime in most African

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[1] This introduction re-uses some wording from the papers included in the dissertation, and earlier versions of the first three papers have been published elsewhere, as noted in Section 5 of the introduction.

countries. For instance, the estimated cumulative real amount of capital flight from Ethiopia in 2012 since 1970 was US$ 31 billion (Geda and Yimer, 2016), which suggests the country was a 'net creditor'[2] to the rest of the world at that time as the value of its private assets held abroad (as measured by this cumulative amount of capital flight) exceeded its external debt stock of US$ 10.4 billion in 2012 (Geda and Yimer, 2016).

Thus, from a capital movement perspective, the situation in Africa presents a stunning paradox (Ndikumana, 2013). In the face of chronic and widening saving-investment gaps in most African states, Africa is also a major source of capital flight (Ndikumana, 2013). Thus, African countries not only need to attract increased external capital inflows (such as FDI) but also need to tackle the problem of capital flight to fill the saving gap in their respective economies.

Capital inflows (and their impact on economic growth) and capital outflows from a country are affected not only by economic fundamentals but also by institutional (political, social and governance) factors in a given country. As noted by North (1981), institutions are ''a set of rules, compliance procedures, and moral and ethical behavioral norms designed to constrain the behavior of individuals in the interests of maximizing the wealth or utility of principals.'' As such, institutions influence and shape the path of overall development by structuring the socio-economic and political interactions among members of a given society (North, 1990; Greif, 1994). Thus, building good quality institutions is one of the crucial activities that developing countries should undertake in order to bring the desired economic development in their economies and lift their populations out of poverty (Rodrik et al., 2004). Empirical studies, by and large, have concluded the positive impact of better-quality institutions on economic growth (see, e.g., Knack and Keefer, 1995; Hall and Jones, 1999; Grogan and Moers, 2001; Acemoglu et al., 2001; Acemoglu, 2008). Similarly, good quality institutions (such as good quality of the bureaucracy, rule of law and property rights, and political stability) in a given country could positively contribute to an increased inflow of FDI to an economy (see, e.g., Asiedu, 2002, 2006; Anyanwu, 2012; Geda and Yimer, 2018). Having good quality institutions also affects capital flight from a country negatively (see, e.g., Ndikumana and Boyce, 2011; Geda and Yimer, 2016). Unfortunately, the quality of institutions in most African countries is appalling. Thus, it seems that it is rather important for empirical studies on the determinants of FDI, capital flight and growth-related works on Africa to consider institutional factors in their analysis.

This dissertation presents four separate studies, presented as Paper 1, Paper 2, Paper 3 and Paper 4 after the introduction. Three of the studies are on the issue of FDI in Africa. Specifically, the determinants of FDI inflows to Africa, the determinants of FDI in Ethiopia, and the FDI-growth nexus in Africa are revisited. In addition, the size and determinants of capital flight in Africa, taking Ethiopia as a case study, is investigated in a separate paper.

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[2] (see Boyce and Ndikumana, 2001)

The rest of this introduction discusses the problems to be addressed, the objectives, methodologies, and the structure of the dissertation. In addition, it presents the main findings of the four separate papers included in the dissertation.

2. Problems to be addressed

In this section, the problems to be addressed in each of the papers contained in the dissertation are discussed.

Despite the seriousness of the problem of capital flight from Ethiopia (Geda and Yimer, 2016) there are only a handful of studies that investigate the size and determinants of capital flight from that country. The available studies are not without limitations either (see Paper 1 for details). In general, they deal with the macroeconomic determinants of capital flight and overlook political and institutional factors in their analysis. Problems in theoretical foundations, data quality and econometric methodology are also some of their limitations. Thus, Paper 1 of this dissertation presents a study that attempts to fill these gaps.

There exists a large body of literature on the determinants of FDI flows to developing countries in general, but little has been done on these flows to African countries specifically. The few available studies conducted on Africa generally deal with the economic determinants of FDI inflows to the continent (see Paper 2 for details). Political and institutional factors are mostly overlooked in the available studies. The existing cross-country studies also suffer from the problem of aggregation of countries that have different salient features in their analysis. They are not theoretically and empirically systematic either. Furthermore, previous studies fail to account for possible cross-sectional dependence in their econometric analyses. Thus, Paper 2 in this dissertation attempts to address these gaps by developing a new analytical country classification for African countries which takes into account cross-country differences. It also accounts for institutional and political factors and the problem of cross-sectional dependence that previous studies have overlooked.

The existing cross-country and panel data studies on the determinants of FDI are helpful to identifying the general factors that determine the inflows of FDI to a host country. However, they fail to give a detailed account of country-specific factors that are crucial for attracting FDI in individual countries. In order to make more concrete what is learned from Paper 2's panel data study on Africa, Paper 3 of this dissertation investigates the issue by taking Ethiopia as a case study. There are not many studies done on Ethiopia to investigate the determinants of FDI inflows into the country, and the few studies that are available have various shortcomings (see Paper 3 for details). Like the cross-country studies on Africa, the few available country case-studies on Ethiopia deal only with the economic determinants of FDI inflows and overlook the role played by political and institutional factors. Most of the existing studies also share the

problems of short time-span of data, omission of relevant macroeconomic variables, and lack of appropriate econometric techniques in modeling both the short-run and long-run dynamics simultaneously. Furthermore, they are not theoretically and empirically comprehensive and systematic. Paper 3 of this dissertation attempts to address these gaps by focusing on the macroeconomic, political and institutional determinants of FDI flows to Ethiopia.

The issue of the FDI-growth relationship has been widely studied with regard to developing countries. Little investigation has been done, however, on such a relationship in Africa, and the existing cross-country and country case studies on Africa regarding this issue have various limitations (see Paper 4 for details), some of which are listed here. First, cross-country studies pool all different countries in one sample without due consideration for heterogeneity across countries in their socio-economic and institutional conditions. Second, available studies typically overlook political and institutional factors as determinants of economic growth. Available studies also often suffer from lack of sound theoretical formulations to investigate the FDI-growth relationship. Finally, they also suffer from problems related to their econometric methodology; mainly from their failure to account for the problem of cross-sectional dependence with panel data and from their failure to account for cointegrating relationships in their analysis. In order to bridge these gaps in the literature, Paper 4 revisits the FDI-growth nexus in Africa.

3. Objective of the Dissertation

As the dissertation is composed of four separate studies, there are four general objectives of the dissertation. These are **a)** to investigate the size and determinants of capital flight from Ethiopia, **b)** to identify the determinants of FDI flows to Africa, **c)** to investigate the determinants of FDI flows to Ethiopia, and **d)** to investigate the FDI-growth nexus in Africa. The specific objectives are:

- ✓ To measure the volume of capital flight in Ethiopia for the period 1970-2012
- ✓ To identify the economic and institutional determinants of capital flight in Ethiopia in the short-run and in the long-run
- ✓ To identify the short-run and long-run institutional and macroeconomic determinants of FDI in Africa by using a new analytical classification of African economies, with each being investment-driven, factor-driven or fragile, and identifying which factors are important for FDI in the respective categories
- ✓ To identify the macroeconomic, political and institutional determinants of FDI in Ethiopia in the short-run and in the long-run
- ✓ To identify the short-run and long-run FDI-growth relationships in Africa using a new analytical classification of African economies, with each being investment-driven, factor-driven or fragile

✓ To identify the channels through which FDI impacts growth in Africa (in investment-driven, factor-driven and fragile African economies) and identify which channel is important in the respective country classifications in the short-run and long-run

✓ To identify the direction of causality in the FDI-growth relationship in investment-driven, factor-driven and fragile African economies

4. Research Methodology and Data Set

All the papers in this dissertation are written based on secondary data sources. The first study ("Capital Flight and its Determinants: The Case of Ethiopia") uses macroeconomic data from National Bank of Ethiopia (2014), the World Bank (2014a, 2014b, 2014c), and the IMF (2014a, 2014b). In addition, data on institutional quality indicators are taken from the World Governance Indicators of the World Bank (2014d) and the International Country Risk Guide of the Political Risk Service Group (2014). In the empirical econometric analysis, both the Johanson (1988, 1991) approach for cointegration and the Pesaran et al. (2001) autoregressive distributed lag modeling (ARDL) approach are employed on a time series data covering the period 1970-2012.

The second study ("Determinants of Foreign Direct Investment Inflows to Africa: Evidence Using A New Analytical Country Classification") uses macroeconomic data for the period 1996-2012 from the World Bank (2014a, 2014b, 2014c) and UNCTAD (2014). For the institutional quality indicators, the World Governance Indicators of the World Bank (2014d) is used. In this study, a new analytical classification of African countries based on their salient features is developed, with each economy being classified as being investment-driven, factor-driven or fragile. In the econometric analysis, the Johansen (1988, 1991) panel cointegration technique is used to identify the short-run and long-run determinants of FDI inflows in investment-driven, factor-driven and fragile economies.

The third study ("Macroeconomic, Political and Institutional Determinants of FDI Inflows to Ethiopia"), utilizes macroeconomic data obtained from the National Bank of Ethiopia (2016), UNCTAD (2016) and the World Bank (2016a, 2016b). For the institutional variables, the World Governance Indicators of the World Bank (2016c) and the International Country Risk Guide of the Political Risk Service Group (2016) are used. The Pesaran et al. (2001) ARDL approach for modeling both the short-run and long-run macroeconomic, political and institutional determinants of FDI flows to Ethiopia on a time-series data for the period 1970-2014 is used.

The fourth study ("The FDI-Growth Nexus in Africa") uses information gathered from UNCTAD (2017), the World Bank (2017a, 2017b), and the Penn World Table by Feenstra et al. (2016). In the econometrics, the study uses a panel-data econometric technique. Specifically, the study uses a dynamic common correlated effect approach for an error-correction model to model

both the short-run and long-run relationships between FDI and growth for the period 1990-2016. To test the presence of long-run relationship between the variables of the empirical model, Westerlund's (2007) test of cointegration is applied. In addition, to compliment the cointegration analysis, panel causality testing is carried out using the Toda-Yamamoto (1995) approach to panel Granger-causality. The study uses the analytical classification developed in the second study according to which African countries are classified as being fragile, factor-driven or investment-driven.

5.   Outline of the Dissertation

Overall, the dissertation consists of four papers in addition to the current introduction. The four separate studies stand as independent articles. The first two papers are co-authored with one of my supervisors (Alemayehu Geda) while the other two are single-authored papers. The first paper is titled "Capital Flight and its Determinants: The Case of Ethiopia," an earlier version of which is published as Geda and Yimer (2016), an article in the *African Development Review*. The second paper, entitled "Determinants of Foreign Direct Investment Inflows to Africa: Evidence Using A New Analytical Country Classification," is a revision of an earlier version published as Geda and Yimer (2018), a book chapter in *Determinants of Economic Growth in Africa*, edited by Almas Heshmati. The third paper is a single-authored paper titled "Macroeconomic, Political and Institutional determinants of FDI Flows to Ethiopia". An earlier version of this paper is published as Yimer (2017), a book chapter in *Studies on Economic Development and Growth in Selected African Countries*, edited by Almas Heshmati**.** The last paper presents another single-authored paper entitled "FDI-Growth Nexus in Africa". This paper investigates the FDI-growth nexus in Africa for the period 1990-2016 using a dynamic common correlated effects approach for an error-correction model. Earlier versions of this paper were presented at seminars at Jönköping International Business, Jönköping University, in Sweden (June 2017 and October 2017), at the East Africa Business and Economic Watch conference in Kigali (June 2017), and at the Addis Ababa International Conference on Business and Economics in Addis Ababa (December 2017).

6.   Summary and Conclusion of the Dissertation

The main findings of the studies in this dissertation are summarized below.

The first study, entitled "Capital Flight and its Determinants: The Case of Ethiopia," explores the volume and determinants of capital flight from Ethiopia for the 1970–2012 period, focusing on economic, institutional, and political determinants. Using the adjusted residual method of capital flight estimation technique, the amount of real total capital flight from the country during the period 1970-2012 was US$ 31 billion. In the 'Derg' regime, the average amount of capital flight from the country was around half a billion dollar. This figure increased

to nearly US$ 1 billion during the Ethiopian People's Revolutionary Democratic Front (EPRDF) regime. The latter is more than 50 percent of the mean annual export earnings of the country for the same period. Given the seriousness of the capital flight problem in the country, an empirical investigation of the factors behind the phenomenon using error-correction modeling approach was undertaken. The empirical results indicate that macroeconomic instability, the level of financial market development, exports, interest-rate differentials, political instability, corruption, and debt-creating flows are important determinants of capital flight from Ethiopia. The political environment is also found to be crucial. From a descriptive analysis based on historical facts, this study finds that capital flight was generally high before violent regime changes and generally low in the immediately subsequent periods, when regimes were in the process of establishing a firmer grip on power. After this point, however, capital flight began to increase substantially again. The historical analysis points to potential causality running from political factors to capital flight. Improving economic stability and the quality of institutions in the country are some of the important areas that the government could work on to takle the capital-flight problem in the country.

The second paper, entitled "Determinants of Foreign Direct Investment Inflows to Africa: Evidence Using A New Analytical Country Classification," develops a new analytical country classification of African economies based on their salient features, with each being classified as fragile, factor or investment-driven. Based on this classification, this study investigates the main determinants of FDI flows to Africa. Using a panel cointegration methodology for data from the period 1996 to 2012, the study finds that market size, natural-resources availability, international-trade openness, a stable macroeconomic environment, better infrastructure and an effective bureaucracy have strong positive impacts in attracting FDI to Africa. On the other hand, macroeconomic and political instability and large financial and transfer risks have negative effects in attracting FDI to the continent. However, the effects of these factors on FDI vary significantly across the country classifications, with some notable patterns. First, among all the considered FDI determinants only government effectiveness in the long run and natural resource abundance in the short run were important determinants of FDI to all the African countries considered in the study. Second, the adjustment towards equilibrium is found to be the fastest in investment-driven economies, followed by fragile and factor-driven countries. Third, it is found that natural-resource abundance is not important in investment-driven countries while it is very important in fragile economies. Fourth, openness is found to be an important determinant of FDI only in investment-driven economies. Similarly, financial transfer risks (proxied by the external debt stock to GDP ratio) were not important for factor-driven economies. Political stability is found to be important for FDI inflows only for investment and factor-driven economies. These findings suggest the need for designing and implementing different policies in different countries or country groups.

The third paper, entitled "Macroeconomic, Political and Institutional Determinants of FDI Inflows to Ethiopia," explores the short- and long-run macroeconomic, political and institutional determinants of FDI flows to Ethiopia for the period 1970-2014. Based along the lines of Dunning's (1981, 1988) "eclectic" theoretical framework of FDI flows and using an ARDL modeling approach, political and institutional factors are found to be crucial in the FDI inflows to the country. Both in the short-run and long-run, economic factors such as market-related characteristics, openness of the economy, availability of low-cost abundant labor supply, and infrastructure development are found to be the main determinants of FDI inflows to the country. Also, political stability and good-quality institutions (using an aggregate indicator) are found to have significant positive effects on the FDI inflows to the country. However, macroeconomic stability is found to be important for FDI inflows in the long-run only. The long-run results support there being a regime shift in 1991 that has led to greater FDI inflows in that year and after, all else equal, which is arguably due to a more liberalized economy and business-friendly environment. Nevertheless, it can be argued that, despite the presence of favorable economic factors, FDI may not flow into the country if the political stability and the quality of institutions are poor.

The fourth paper, entitled "FDI-Growth Nexus in Africa," investigates the FDI-growth nexus in Africa for the period 1990-2016 using the dynamic common correlated effects estimation methology of Chudik and Pesaran (2015) for an error-correction model. In the empirical model, derived from a variant of endogenous growth theoretical models, the effect of FDI on output is investigated using the FDI variable as it stands (without interaction with other regressors) and with two interaction terms for it (an interaction term between FDI and human capital and an interaction term between FDI and an aggregate measure of political and institutional quality). The effect of FDI on output is found to be mixed. It varies across the country groups and the time horizon considered. A significantly positive effect of FDI on output is found in investment-driven economies (both in the short-run and long-run) and in factor-driven economies (in the long-run). While such an effect of FDI is insignificant in factor-driven economies in the short-run, it is totally absent in the fragile category both in the short-run and the long-run. In addition, the interaction effect of FDI and human capital on output is largely missing in Africa, except in the long-run for investment-driven economies, in which a positive relationship is found. On the other hand, the effect of the interaction term between FDI and an aggregate political and institutional indicator is found to be positive for investment-driven (significant both in the short-run and long-run) and factor-driven economies (weakly significant in the long-run). This interaction effect is insignificant both in the short-run and the long-run for fragile African states, however. The results of the Toda and Yamamoto (1995) panel causality test indicate the presence of bi-directional causality between FDI and output in investment-driven economies, unidirectional causality running from FDI to output in factor-driven economies, and no causality for fragile African economies in either direction. In general, it can be argued that the growth effect of FDI depends on a country's absorptive capability, the type of trade regime it has, the

type of FDI it receives, and the quality of institutions and political stability in place, among other things.

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Capital Flight and Its Determinants: The Case of Ethiopia
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Paper 2:

Determinants of Foreign Direct Investment Inflows to Africa: Evidence Using A New Analytical Country Classification
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Macroeconomic, Political and Institutional Determinants of FDI Inflows to Ethiopia
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The FDI-Growth Nexus in Africa
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Paper 1: Capital Flight and Its Determinants: The Case of Ethiopia

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Capital Flight and Its Determinants: The Case of Ethiopia

Alemayehu Geda and Addis Yimer

Abstract

This study attempts to estimate the volume of capital flight from Ethiopia and its determinants, focusing on economic, institutional, and political determinants. Capital flight is estimated at US$ 31 billion over the 1970–2012 period. On average, the country lost around half a billion dollars annually under the 'Derg' regime. This amount nearly doubled to US$ 1 billion per annum during the EPRDF regime. The empirical evidence suggests that macroeconomic instability, the degree of financial market deepening, exports, interest rate differentials, political instability, corruption, and debt-creating flows are the most important determinants of capital flight from Ethiopia. The political environment is also found to be crucial. Generally, capital flight was high before violent regime changes and low in the subsequent periods, when regimes were in the process of establishing a firmer grip on power; after this point, however, capital flight began to rise significantly again. The historical analysis points to potential causality running from political factors to capital flight. A strong improvement in economic and political governance will be key to abating the problems of capital flight in Ethiopia.

Keywords: Capital flight, Determinants, Error-correction model, Ethiopia, Africa.

JEL Classification Codes: F21; F32; F34

Capital Flight and Its Determinants: The Case of Ethiopia[♣]

Alemayehu Geda and Addis Yimer

1. Introduction

The African continent is facing substantial and growing financing gaps that are hindering public investment and leading to poor social service delivery. Paradoxically, Africa is also the source of large-scale capital flight, which has escalated during the last decade. According to Ndikumana et al. (2015), 39 African countries lost a total of US\$ 1273.8 billion (in constant 2010 dollars) from 1970 to 2010. This surpasses by a large margin the stock of debt (US\$ 283 billion) owed by these countries in 2010 (Ndikumana et al., 2015).

Capital flight is an important issue in Ethiopia because of its deleterious impact on economic growth, macroeconomic stability, income distribution, and welfare. Ethiopia was also ranked 8th in sub-Saharan Africa in terms of cumulative real capital flight, which amounted to US\$ 25 billion in 2010 (Boyce and Ndikumana, 2012). This represents approximately 84 percent of the annual official GDP of the country. In the same study, the stock of capital flight from Ethiopia stood at US\$ 29.9 billion in 2010, including interest earnings on past outflows, which is well above the stock of external debt of US\$ 7 billion in 2010. These numbers show the severity of the problem of capital flight from Ethiopia.

According to a Global Financial Integrity (GFI) study in 2011, Ethiopia, with real GDP of US\$ 16.6 billion in 2009, lost US\$ 11.7 billion to illicit financial outflows between 2000 and 2009. More worrying is that the study shows that Ethiopia's losses due to illicit capital flows are on the rise. The study concludes that 'the people of Ethiopia are being bled dry' by the excessive capital flight (GFI, 2011).

Despite the serious capital flight problem in Ethiopia, few country-specific studies have investigated the size and determinants of capital flight in the country. The few that exist (most of which are unpublished Master's theses) generally focus on the economic determinants of capital flight, and do not examine political and institutional dimensions of capital flight systematically. This paper attempts to fill this gap.

The rest of the paper is organized as follows. Section 2 discusses the political economy context of the study. Section 3 presents estimates of capital flight from Ethiopia. Empirical evidence on the

determinants of capital flight is presented in Section 4, and Section 5 concludes.

2. The Political Economy Context

The competition for power is central to understanding the political economy of Ethiopia. History, institutions, the path- dependent nature of state formation and external intervention are important in the Ethiopian context. Ethiopia's economic performance and the dynamics of political inistability in the country are closely linked (Geda, 2004). Political instability and a sudden drastic policy shift are at the center of Ethiopia's long years of political history (Geda, 2001). Such political processes considerably affect economic agents' behavior. The last four decades witnessed regimes which continued the same pattern of conflicts, drastic policy changes, and reversals that is noted in Geda (2001). Such political processes have an adverse effect on economic performance and poverty reduction efforts in the country (Geda, 2008; Geda and Degefe, 2005).

The analysis in this paper focuses on two of the three most recent regimes that the country witnessed in the last century: the Imperial regime, which prevailed from 1930 to 1973; the 'Derg' or the military regime, and the Ethiopian People's Revolutionary Democratic Front (EPRDF), which is the current regime. We will focus on the latter two regimes. The period 1974–91 corresponds to the 'Derg' (Military) regime that ousted Emperor Haile-Selassie I, the last king of Ethiopia. The 'Derg' conducted a socialist experiment in which a centralized command system controlled all spheres of socio-economic policymaking in the country. This regime was characterized by a deliberate repression of market forces. It socialized production and distribution processes and adopted a policy of 'hard control' (Geda, 2008). In this period, economic performance was highly erratic due to inadequate policies, the dependence of economic growth on the agricultural sector (which is vulnerable to the vagaries of nature), and intense conflict between the regime in power and the then-opposition parties that characterized the period (Geda, 2008).

The second period, from 1991 to present, is a period that begins with the coming to power of the EPRDF in 1991 that ousted the 'Derg' regime militarily. This regime departed significantly from the doctrines of the command system in favor of the market. The EPRDF regime adopted typical structural adjustment policies of market liberalization with the support of the World Bank and the IMF in 1992 (Geda, 2008). Economic performance during this period substantially improved and appears to be the combined result of the reforms, better economic policies, favorable weather conditions, increased political stability, and significant inflows of external capital (Geda, 2008; Geda and Yimer, 2014). It is in the context of these two regimes that the analysis in this study needs to be understood.

3. Estimates of Capital Flight from Ethiopia

Despite its importance, the measurement of capital flight is a matter of controversy, mainly due to its definitional challenges (Ajilore, 2010). There are a number of capital flight measures in the literature. (see Hermes et al., 2002). Several capital flight measures in the literature may lead to differences in capital flight estimates (Hermes et al., 2002).[1] The indirect method of measuring capital flight is widely used in the literature to estimate capital flight from developing countries (Schneider, 2003). This study adopts the approach of Boyce and Ndikumana (2001), which is an extension of the 'residual' method used by the World Bank (1985), and Erbe (1985).

The 'residual' method is an indirect method for measuring capital flight (see, e.g., Erbe, 1985; World Bank, 1985; among others). As noted by (Hermes et al., 2002: 2-3), "this method measures capital flight indirectly by comparing the *sources* of capital inflows (i.e., net increases in external debt and the net inflow of foreign investment) with the *uses* of these inflows (i.e., the current account deficit and additions to foreign reserves)."[2]

Boyce and Ndikumana (2001) adjusted the residual method by accounting for export and import misinvoicing. In addition, they incorporated adjustments for the effects of exchange rate fluctuations on dollar denominated external debt (Boyce and Ndikumana, 2001). Furthermore, adjustment for underreported remittance and debt write-offs as well as differences that may arise from recording trade inconsistently using or not using the fob (free on board) and cif (cost, insurance and freeing) factors are incorporated (Boyce and Ndikumana, 2001). Thus, in this approach, for country i in year t, capital flight is computed as follows (see Boyce and Ndikumana, 2001):

$$KF_{it} = \Delta DEBTADJ_{it} + FDI_{it} - (CA_{it} + \Delta RES) + MISINV_{it}$$

where $DEBTADJ$ is the change in the country's stock of external debt (adjusted for cross currency exchange rate fluctuations, to take into account the fact that debt is denominated in various currencies and then aggregated in US dollars); FDI is net direct foreign investment; CA is the current account deficit; ΔRES is the change in the stock of international reserves; and $MISINV$ is net trade misinvoicing (i.e.; under-invoicing of exports and over-invoicing of imports by Ethiopians).

Table 1 presents the results. We find that the total real capital flight during the 1970–2012 period is about US$ 31 billion. On average, the country lost around half a billion dollars annually under the 'Derg' regime. This amount more than doubled to nearly 1 billion US$ per

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[1] see Hermes et al. (2002) for the critical discussion on the various methods in the literature.
[2] In this method, all unrecorded private capital outflows are considered as capital flight (*KF*) and it is calculated as *KF*=Δ*ED*+*FI*–*CAD*–Δ*FR*, where *KF* is capital flight, Δ*ED* is change in stock of gross external debt, *FI* is the net foreign investment inflows, *CAD* is the current account deficit, and *FR* is the stock of official foreign reserves (Hermes et al., 2002). See also Erbe (1985), World Bank (1985), and Schneider (2003).

annum during the EPRDF regime. Capital flight amounts to more than 50 percent of the country's average annual exports during this period. The results suggest that Ethiopia is a 'net creditor' to the rest of the world in the sense that its private assets held abroad, as measured by the stock of capital flight, exceeded its total liabilities as measured by the stock of external debt, which was just US$ 10.4 billion in 2012 (see World Bank 2014b). While it is not possible, using the available data, to distinguish between the capital flight associated with the private sector from that orchestrated by the political elite, the results nonetheless show that total capital flight during the 'Derg' regime was much lower than the amount of capital flight during the EPRDF regime. The EPRDF regime accounts for about 70 percent of the stock of capital flight during the entire period under analysis.

Table 1: Capital Flight from Ethiopia over 1970-2012 (constant 2012 US$ in millions)[3]

Year	Capital Flight 1970–90 The Derg Regime[*]	Year	Capital Flight (1991–2012) The EPRDF Regime
		1991	410.6
1970	10.7	1992	−725.6
1971	−140.9	1993	−420.5
1972	771.6	1994	145.6
1973	163.9	1995	91.9
1974[*]	−72.4	1996	−33.3
1975	−84.5	1997	605.7
1976	−324.7	1998	398.3
1977	−138.4	1999	−689.5
1978	41.0	2000	170.8
1979	37.6	2001	2969.6
1980	−160.8	2002	3148.6
1981	1457.5	2003	1700.8
1982	2784.0	2004	1631.3
1983	1072.0	2005	−144.5
1984	392.1	2006	309.6
1985	1272.1	2007	2376.2
1986	771.4	2008	198.4
1987	1794.8	2009	2491.2
1988	−561.0	2010	4096.3
1989	−445.9	2011	1818.7
1990	702.2	2012	886.7
Total capital flight	9342.4		21437.1
Average annual capital flight	444.9		974.4
Grand total (1970–2012): US$ 30779.5			

* the Derg regime begins in 1974
Source: Authors' Computation

Figure 1 shows the pattern of capital flight across the two political regimes. Two years before the 1974 revolution, we see a rise in capital flight. Following the revolution, and up to the year 1981, the country was wracked by internal political turmoil, including a war with Somalia that ended in 1978. The Derg regime did not firmly establish itself until the beginning of the 1980s. As shown in the figure, there was generally little capital flight during this time. From 1981, however, capital

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[3] Negative values indicate inward capital flight.

flight began to rise, and this upward trend continued until 1987. During this latter period the country was hit by a severe drought in 1984–85. Moreover, the Derg government established a firm grip on the country, consolidated by the 'election' of the Derg chairman Colonel Menigistu H. Mariam as president, following a new constitution in 1987 and capital flight shows a sign of decline, in particular in 1988 and 1989. During this period, Ethiopia also signed a peace deal with Somalia in 1988. However, capital flight was positive in the immediate years just before the fall of the Derg (in 1990 and 1991).
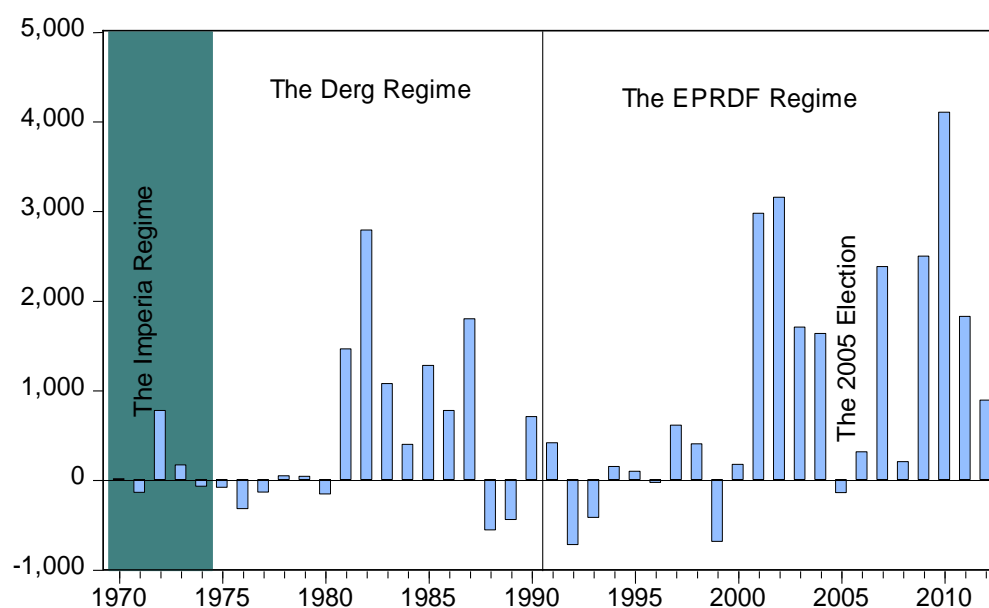
Figure 1: Capital Flight during the Derg and EPRDF Regimes (constant 2012 US$, in million)

Source: Authors' computation

Following the fall of the Derg in 1991, and until 2000, the level of capital flight was low, and at times negative. From 1992– 2000, the new EPRDF regime was in the process of establishing itself, dealing with the independence of Eritrea, and carrying out far-reaching political and economic policies. War with Eritrea began in 1999. During this period, the level of capital flight was negligible. It was followed, however, by a sharp rise in capital flight that began in 2000 and continued until the election of 2005. During this period, the regime began to establish firmly its control over power. It also attempted to normalize its relationship with Eritrea through the signing of a peace deal in 2002 and 2003.

After a sharp decline during the violent and disputed election of 2005, where all opposition leaders were jailed and many protestors killed, the country experienced a large amount of capital flight, with the sharpest rise occurring in 2010, when it reached over US$ 4 billion. This last period was politically eventful, as it saw the release of the jailed opposition leaders, the total victory of the ruling EPRDF in the 2010 elections (which were disputed by the opposition and

criticized by European Union observers), the rise in tension with Eritrea and the latter's support for Ethiopia's opposition groups, as well as the death of the long-time prime minister and leader of the EPRDF, Meles Zenawi in 2012.

While it is difficult to establish a systematic relationship between capital flight and political cycles, it appears that generally, capital flight was high before violent regime changes and low in the subsequent periods, when regimes were in the process of establishing a firmer grip on power; after this point, however, capital flight began to rise significantly again. The historical analysis points to potential causality from political factors to capital flight. This will be explored empirically in the next section.

4. Econometric Analysis of the Determinants of Capital Flight

As was mentioned before, growth and poverty reduction in Africa is constrained by lack of development finance, and yet there is significant capital flight from Africa (Ndikumana and Boyce, 2011a; Boyce and Ndikumana, 2012; AfDB and GFI, 2013). Our data presented in Section 2 is an illustration of this phenomenon. Thus, it is imperative to investigate empirically the reasons behind such large capital flight from Ethiopia. In this section an error-correction model on the determination of capital flight from Ethiopia will be estimated based on 1970-2012 annual data from the World Bank (2014a, 2014b, 2014c, and 2014d), National Bank of Ethiopia (2014), IMF (2014a, 2014b), and the Political Risk Services Group (2014). The next subsection presents the specification of the empirical model and the econometric approach followed in the eastimation of the model and the one after that presents the findings of the study.

4.1 Specification and Estimation of the Empirical Model

Although there are no country-specific studies on the determinants of capital flight from Ethiopia, there exists a large body of literature on other developing countries.[4] Even though the results vary, due in part to differences in the measurements of capital flight used, the countries considered, the econometric techniques, and the models employed, some important empirical regularities can be pointed out. Most of the studies focusing on African countries identified macroeconomic and political conditions as important factors of capital flight (see, e.g., Lensink et al., 1998; Collier et al., 2001; Ndikumana and Boyce, 2003; Cerra et al., 2005; Ndiaye, 2009; Ndikumana and Boyce, 2003, 2011b; Ndikumana et al., 2015; Ndiaye and Siri, 2016; Ramiandrisoa and Rakotomanana, 2016). More specifically, the list of determinants includes past capital flight, capital inflows, and capital stock (measured by debt inflows, debt stock, and aid flows), macroeconomic instability (measured by exchange rate overvaluation, government deficits, the inflation rate, and current account deficits), rate of return differentials, financial

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[4] See Table A1 in Appendix for the summmry of some of the recent litreatures on the determinants of capital flight in Africa.

development, governance and institutional quality, political risks and war, and the uncertainty of public policies (measured by government consumption expenditures, taxes, budget deficits, and real interest rates) (Ajayi, 1992; Ng'eno, 2000; Olopoenia, 2000; Hermes and Lensink, 2001; Hermes et al., 2002; Cerra et al., 2005; Ndikumana and Boyce, 2003, 2008; Ajayi, 2007; Ndiaye, 2009; Le and Rishi, 2006; Ndiaye and Siri, 2016; Ramiandrisoa and Rakotomanana, 2016).

In light of the evidence in the literature discussed above, we investigate the potential determinants of capital flight from Ethiopia by estimating an auto-regressive distributed lag model (ADL) informed by the theoretical framework offered in detail in Geda and Yimer (2015).[5] An ADL (1,1) formulation of endogenous (Y) and exogenous (X) variables of this model is given by

$$Y_t = \gamma_0 + \beta_0 X_t + \beta_1 X_{t-1} + \alpha_1 Y_{t-1} + u_t \tag{1}$$

$$\text{with } Y_t = lnKF_t, \ X_t = \begin{bmatrix} lnAid_t \\ lnDEBFLO_t \\ lnDEBSTO_t \\ lnExports_t \\ lnBUDSUR_t \\ lnINTDIFF_t \\ lnNEXR_t \\ lnM2GDP_t \\ POLSTAB_t \\ CORR_t \end{bmatrix}$$

where *KF* is capital flight, *NEXR* is the nominal exchange rate, *BUDSUR* is the budget surplus (deficit) of the government, *Exports* is exports of goods and services, *INTDIFF* is the interest rate differential between Ethiopia and the rest of the world (proxied by the difference between the US treasury bill rate and the Ethiopian deposit interest rate), *Aid* is the net inflows of aid, *DEBFLO* is net debt flows, *DEBSTO* is debt stock, *M2GDP* is the ratio of M2 to GDP (a proxy for financial depth), *POLSTAB* is a political stability index, and *CORR* is a control of corruption index.

The political and economic environment is depicted by *POLSTAB* and *CORR*. *NEXR*, *BUDSUR* and *M2GDP* are used as proxies for the macroeconomic environment. *Aid*, *Exports* and *DEBFLO* are used as a proxy for the availability of foreign exchange. *INTDIFF* is used as an indicator of the financial benefit of engaging in capital flight. The prefix 'ln' indicates that the variables are in their natural logarithmic form. Table A2 in the Appendix provides the

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[5] Readers are advised to consult the working paper noted (Geda and Yimer, 2015) that outline the cost function estimated here as well as the African literature on capital flight. The cost function estimated here is fully derived using a dynamic optimization theoretical framework in the working paper. The growth and poverty implications of this capital flight are also analyzed in the same. We left that here to save space.

definitions of the variables and the sources of the data used.

The econometric estimation is based on the following error-correction model (ECM):

$$Y_t = \gamma_0 + \beta_0 \Delta X_t - (1 - \alpha_1)[Y_{t-1} - \gamma_1 X_{t-1}] \qquad (2)$$

where

$$\Delta X_t = X_t - X_{t-1}$$

and the long run coefficients are given by the vector

$$\gamma_1 = \frac{\beta_0 + \beta_1}{1 - \alpha_1}$$

Before estimating this model, we carry out a test for stationarity of the variables in the model and find that all the variables are integrated of order one, I(1) (see Table A3 in the Appendix). In addition, a test for co-integration using both the Johansson (1988, 1991) test and the Pesaran et al. (2001) bounds test shows that the variables are indeed co-integrated, justifying the use of the ECM (Engle and Granger, 1987) (see Table A4 and A5 in the Appendix). In the standard ordinary least squares model, the coefficient variance-covariance matrix is derived under the assumption that the error terms are conditionally homoskedastic and serially uncorrelated (White, 1980). In cases where these assumptions fail to hold, the inference based on the resulting ECM will be misleading (White, 1980; Roecker, 1991; Wooldridge, 2000). Given that the problem of heteroskedasticity and serial correlation is common in time series analysis of this nature, it is necessary to estimate the coefficient covariance under the assumption that the residuals are conditionally heteroskedastic and autocorrelated (Newey and West, 1987). The coefficient covariance estimator under this assumption is what is referred to as the Heteroskedasticity and Autocorrelation Consistent Covariance (HAC) or Newey-West estimator. This approach does not change the coefficients. Rather, it only alters the coefficients' standard errors without changing the coefficients (Newey and West, 1987). In this study we have followed this procedure.

4.2 Estimation Results

The results show that the estimated model has a good fit. In addition, the model passes all post-estimation diagnostic tests carried out including tests for normality, heteroskedasticity, serial correlation, model specification, and stability. Table 2 presents the results for the short-run and long-run determinants of capital flight in Ethiopia. It also reports the various diagnostic tests of the model. Below, we discuss the major findings of the study.

Table 2: Determinants of Capital Flight from Ethiopia (1970-2012)[6]

Dependent Variable: Δ(Log of Capital Flight), No of Observation=42

Variable	Coefficients	t-Statistic
Short Run		
Constant	16.65	6.56*
Δ(Log of aid)	1.59	12.13*
Δ(Log of external debt flows)	0.28	4.06*
Δ(Log of external debt stock)	0.63	4.47*
Δ(Log of exports)	1.07	4.04*
Δ(Log of budget surplus)	-0.72	-2.96*
Δ(Log of interest rate differential)	0.68	9.23*
Δ(Log of nominal exchange rate)	-1.76	-3.96*
Δ(Log of M2 to GDP ratio)	4.63	7.25*
Error correction term[a]	-0.98	-13.92*
Long Run		
Log of aid (-1)	0.55	3.75*
Log of external debt flows (-1)	0.15	1.97**
Log of external debt stock (-1)	-0.09	-1.49
Log of exports (-1)	0.55	5.92*
Log of budget surplus (-1)	-1.04	-16.26*
Log of interest rate differential (-1)	0.01	0.05
Log of nominal exchange rate (-1)	-0.12	-1.48
Log of M2 to GDP ratio (-1)	0.95	4.60*
Political tability index	-1.16	-6.35*
Control of corruption index	-1.20	-4.83*

Diagnostic Tests			
R-squared	0.97	Adjusted R-square	0.93
Jarque-Bera	0.36	Ramsey RESET Test: P-value	0.64
Jarque-Bera: P-value	0.83	Breusch-Godfrey Serial Correlation LM Test: P-value	0.06
F-statistic	24.8	White Heteroskedasticity Test: P-value)	0.60
F-statistic: P-value	0.00		

*, **, Significant at 1% & 5% levels, respectively; [a] The coefficient estimate for the error correction term is also that for the lagged dependent variable.

Macroeconomic Conditions

The coefficient of the nominal exchange rate (*NEXR*) is not statistically significant in the long run. A similar insignificant effect of exchange rate on capital flight has been reported in prior studies for other countries (see, e.g., Ramiandrisoa and Rakotomanana, 2016; Mucha and Muchai, 2016). However, it has the unexpected statistically significant negative sign in the short run. The absence of a statistically significant impact of the exchange rate in Ethiopia may relate to

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[6] EViews 7.1 is used for the eastimation of the model in this study.

the fact that the exchange rate is generally constant (fixed at 2.07 Birr per US$ during the entire Derg regime and between 5 and 9 Birr per US$ during the current EPRDF regime until 2008). The rate of return differential is found to have a statistically significant positive impact in the short run but no impact in the long run. Thus, capital may be expected to flow abroad in the short run as long as the risk-adjusted rate of return to investment is higher elsewhere (Ng'eno, 2000; Ajayi, 1992).

The effect of total exports on capital flight is found to be positive and statistically significant both in the long and short run. This result implies that exports are one of the important factors that facilitate capital outflows from the country by providing foreign exchange. They are also mechanisms for capital flight through under/over invoicing and as an avenue for rent seeking by politically powerful parasatals, the political elites and private individuals (Ajayi, 1992; Ndikumana and Boyce, 2003). As expected, the coefficient on the budget surplus variable has a statistically significant negative effect both in the short and long run. Large government deficits invariably lead to inflation in Ethiopia (Geda and Tafere, 2011). The accompanying macroeconomic instability might prompt economic agents to move capital abroad to escape future direct taxation and indirect taxation via monetization of the deficits.

Capital Flows and Financial Market Development

Aid is found to have a statistically significant positive effect on capital flight both in the long and short run. As Ethiopia is one of the highest recipients of aid in the continent (with an average annual value of about US$ 3 billion in the period 2008–2012), part of this must have found its way out of the country. It is also found that its effect is much stronger in the short run than in the long run, perhaps pointing to its more important role in availing foreign exchange. Both external debt flows and debt stocks are also found to affect capital flight positively in the short run.

The debt flows are found to be important in the long run, too. A similar result has been reported in previous studies also (see, e.g., Ndikumana and Boyce, 2003, 2011a; Ndikumana et al., 2015; Ndiaye and Siri, 2016; Ramiandrisoa and Rakotomanana, 2016). Thus, as outlined in empirical findings by Boyce and Ndikumana (2001), among others, who have focused on other countries, the growing foreign debt of Ethiopia may increase expectations about exchange rate depreciation and higher taxation, which provides a stimulus to hold foreign assets and hence capital flight. Capital flight also forces governments to borrow to bridge the resulting financing gap, which further increases the debt burden and worsens the fiscal balance that in turn triggers capital flight (see also Hermes and Lensink, 1992; Boyce, 1992; Ndikumana, 2009; Ndikumana and Boyce, 2003; Ndikumana and Boyce, 2008, 2011b; Ndiaye, 2009). External debt flows also make foreign exchange directly available to the country. This could facilitate capital flight.

The proxy used to measure financial development, the M2 to GDP ratio, is found to have a statistically significant positive effect on capital flight both in the short and long run, but its

short-run effect is much stronger. This may relate to the notion that, as noted by Ndikumana and Boyce (2003), financial deepening can encourage capital flight if it facilitates international capital transfers. In particular, if financial markets are liberalized and international capital movements are deregulated, then domestic capital may be expected to flow abroad as long as risk-adjusted returns are higher elsewhere (see Collier et al., 2001 for a similar finding). Its significance in Ethiopia, where the sector is not liberalized, however, may relate to the sheer growth of the sector in resource mobilization in the last decade (both domestic and external, in particular remittances), which may affect capital flight. Finally, the long-run coefficient of the lagged capital flight (which is also the adjustment coefficient in this formulation) is also found to have a statistically significant positive effect. This finding suggests, in line with Nyoni (2000), a tendency for capital flight to persist over time (i.e., consistent with the so-called habit formation hypothesis), indicating spillover effects of previous capital flight on the current period's capital flight (Ndikumana and Boyce, 2003, 2011b). The coefficient on lagged capital flight also shows the strong adjustment towards equilibrium found in the Ethiopian capital flight patterns.

Corruption and the Political Economy of Capital Flight

The indicators of political stability and control of corruption are found to have a very strong, statistically significant negative effect on capital flight. Economic performance in Ethiopia is highly correlated with conflict and the political process that accompanies it as noted in the previous section. Ethiopia's history is full of conflicts, drastic policy changes, and reversals that could trigger capital flight. Our analysis of capital flight is based on data from 1970 to 2012. This period saw two political regimes: the Derg and EPRDF regimes. We have managed to incorporate the measurable aspects of politics (political stability and corruption indicators) in our empirical model. The results in Table 2 indicate that creating a stable political environment and efforts to combat corruption may help in tackling the problem of capital flight from the country. Similar results have also been found in some of the earlier studies for other countries (see, e.g., Gankou et al., 2016; Kwaramba et al., 2016; Ndiaye and Siri, 2016; Ramiandrisoa and Rakotomanana, 2016).

To sum up, capital flight from Ethiopia is motivated by factors related to macroeconomic instability (budget deficits and exchange rate depreciation) and the rate of interest differential. We also found that growing levels of capital inflows in the form of export earnings, loans, and aid have financed capital flight. Finally, we have found that corruption and political instability are important determinants of capital flight from the country.

5. Conclusion

This study has explored the magnitude and determinants of capital flight from Ethiopia for the 1970–2012 period, focusing on the economic, institutional, and political aspects. Based on the

adjusted balance of payments residual method, the magnitude of real total capital flight from Ethiopia for the period 1970–2012 was found to be US$ 31 billion. On average, the country lost about half a billion dollars annually during the Derg regime (1970–1991). This figure more than doubled under the EPRDF regime (1991/ 92 to date). The latter is a significant level of capital for a poor country like Ethiopia, as it amounts to more than 50 percent of the country's average annual export earnings during the same period. This makes Ethiopia a 'net creditor' to the rest of the world as its private assets held abroad exceeds its total liabilities as measured by the stock of external debt, which stood at US$10.4 billion in 2012 according to World Bank (2014b). Given this significant level of capital flight from a capital-starved, poor country, an empirical investigation of the factors behind the capital flight phenomenon was undertaken.

The results from the econometric analysis of the determinants of capital flight show that capital flight from the country is motivated by factors related to macroeconomic instability (budget deficits and exchange rate deprecation), the interest rate differential vis-à-vis the rest of the world, political instability, and corruption. We also found that the rising level of capital inflows in the form of aid, loans, and export earnings have financed the capital flight from the country. The level of financial market development is also found to affect capital flight positively. And finally, political and macroeconomic factors are important drivers of capital flight in Ethiopia. Thus, increased control of corruption and improved political and macroeconomic governance are key factors in controlling capital flight from Ethiopia. The results suggest the need to strengthen democratic governance, the rule of law, transparency, and accountability to abet capital flight and induce its reversal.

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Appendix

Table A1: Some Recent African Empirical Studies on the Determinants of Capital Flight

Authors	Coverage	Capital Flight Measure	Econometric Approach	Determinants
Nyoni (2000)	Tanzania (1973-1992)	Residual	Regression in first differences	Debt flows (0), past capital flight (-), growth rate differential (+), inflation (0), parallel market premium (0), interest rate differential (0), political shock dummy (0)
Ng'eno (2000)	Kenya (1981-1995)	Residual	OLS on quarterly data	Real GDP (+), interest rate differential (-), exchange rate (+)
Ndikumana and Boyce (2008)	40 SSA Countries (1970-2004)	Residual	Time series	First lag of capital flight (+), second lag of capital flight (+), change in debt (+), debt stock (+), lagged growth rate (-), inflation differential (0), financial development (0), fuel export (0), interaction between fuel export and governance (0), GDP (+), variation in inflation rate (+), ratio of external public debt to GDP (+), ratio of domestic debt to GDP (-), political stability (0)
Ndiaye (2009)	Franc Zone African Countries 1970 to 2005.	Residual	Panel GMM	External debt (+); foreign aid (+); natural resources revenues (+); poor governance (+); bad institutional quality (+); inflation (+), exchange rate overvaluation (+), terms of trade (-), uncertainty with respect to government consumption (+), real interest rates (+); budget deficits (+).financial system development (-); past capital flow (+); rate of return differentials (+; armed conflict (+/0)
Ndikumana, et al. (2015)	39 African Countries (1970-2010)	Residual	PanelfFixed effect, IRLS and GMM	External borrowing (+), external debt stock (+), economic growth (-),
Ramiandrisoa and Rakotomanana (2016)	Madagascar (1970-2012)	Residual	Time series	Political instability (+), corruption (+), external borrowing (+)
Gankou et al. (2016)	Cameroon (1970-2012)	Residual	Time series	External debt (+), poor institutional environment (+), foreign direct investment (0) and official development aid (0).
Ndiaye and Siri (2016)	Burkina Faso, (1970-2012)	Residual	Time series	Ineffective foreign exchange regulation (+), a lax tax system (+) and corruption (+). Capital flight is also found to significantly affect tax revenue negatively

Notes: (+) denote a statistically significant positive effect, (-) in parentheses denote a statistically significant negative effect, (0) denotes a statistically insignificant effect

Table A2: Definition of Variables and Source of Data

Variables	Definition	Sources
CF	Capital flight, in Current US$	Based on Ndikumana and Boyce (2012) & our update
Aid	Net official development assistance and official aid received, in Current US$	World Bank (2014a)
DEBSTO	External debt stocks, total in current US$	World Bank (2014b)
DEBFLO	Net flows on external debt, total in current US$	World Bank (2014b)
M2GDP	Money and quasi money (M2) as percent of GDP	National Bank of Ethiopia (2014)
BUDSUR	Overall budget surplus/deficit, excluding all grants, in current US$	World Bank, (2014c).
X	Exports of goods and services, in current USD	World Bank, (2014c)
NEXR	Official exchange rate (birr per US$, period average)	World Bank (2014c)
INTDIFF	Interest rate differential	Authors' computation as a difference between the US treasury rate and the domestic deposit interest rate based on data from National Bank of Ethiopia (2014), and the IMF (2014b)
CORR	Control of Corruption Index	World Bank (2014d) and Political Risk Service Group (2014)
POLSTAB	Political Stability Index	World Bank (2014d) and Political Risk Service Group (2014)

Table A3: Unit-Root Test Results

Variables	In Levels		In First Differences		Conclusion
	Intercept	Intercept & Trend	Intercept	Intercept & Trend	
Log of capital flight	-2.482	-1.991	-8.010	-7.963	**I(1)**
	(0.127)	(0.589)	(0.000)	(0.000)	
Log of aid	-1.770	-2.115	-6.872	-6.937	**I(1)**
	(0.340)	(0.523)	(0.000)	(0.000)	
Log of debt flows	-2.309	-2.592	-7.563	-7.465	**I(1)**
	(0.174)	(0.286)	(0.000)	(0.000)	
Log of debt stock	-2.308	-1.532	-4.409	-4.658	**I(1)**
	(0.174)	(0.801)	(0.001)	(0.003)	
Log of exports	-0.608	-1.475	-5.474	-5.428	**I(1)**
	(0.858)	(0.823)	(0.000)	(0.000)	
Log of budget surplus	-1.446	-2.908	-8.849	-8.731	**I(1)**
	(0.550)	(0.171)	(0.000)	(0.000)	
Log of interest rate differential	-2.440	-2.833	-6.619	-6.569	**I(1)**
	(0.137)	(0.194)	(0.000)	(0.000)	
Log of nominal exchange rate	0.088	-2.542	-3.283	-3.642	**I(1)**
	(0.961)	(0.308)	(0.022)	(0.038)	
Log of M2 to GDP ratio	-2.750	-0.705	-6.013	-7.121	**I(1)**
	(0.074)	(0.966)	(0.000)	(0.000)	
Political Stability Index	-1.14	-0.75	-4.42	-4.15	**I(1)**
	(0.68)	(0.96)	(0.00)	(0.02)	
Control of Corruption Index	-1.79	-2.70	-4.82	-4.72	**I(1)**
	(0.37)	(0.24)	(0.00)	(0.00)	

Note: P-Values in Bracket

Table A4-: Johansen Cointegration Test

Hypothesized No. of CE(s)	Eigen value	Trace Test		Max-Eigen Test	
		Trace Statistic	0.05 Critical Value	Max-Eigen Statistic	0.05 Critical Value
None *	0.786	177.050	159.529	60.154	52.363
At most 1	0.551	116.896	125.615	31.242	46.231
At most 2	0.490	85.655	95.754	26.257	40.078
At most 3	0.416	59.398	69.819	20.979	33.877
At most 4	0.340	38.419	47.856	16.222	27.584
At most 5	0.298	22.197	29.797	13.781	21.132
At most 6	0.163	8.416	15.495	6.919	14.265
At most 7	0.038	1.497	3.842	1.497	3.842

 * denotes rejection of the hypothesis at the 0.05 level
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

Table A5: ARDL Bound Cointegration Test

F Wald test	F Wald test: P-Value at 1 Percent level of significance
4.895	0.0024*

* Bound test indicates the presence of cointegration at 1 percent level of significance

Paper 2: Determinants of Foreign Direct Investment Inflows to Africa: Evidence Using A New Analytical Country Classification

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Determinants of Foreign Direct Investment Inflows to Africa: Evidence Using A New Analytical Country Classification

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Abstract

Based on a new analytical country classification of African economies as fragile, factor and investment driven economies, we identify the main determinants of FDI inflows to Africa. Using a panel co-integration approach for the period 1996 to 2012, we find market size, availability of natural resources, openness to international trade, a stable macroeconomic environment, better infrastructure and an effective bureaucracy to have strong positive impacts in attracting FDI to Africa. On the other hand, political and macroeconomic instability and high financial and transfer risks have negative effects in attracting FDI to the continent. However, the effect of these factors varies significantly across the analytical country classification that we have developed. Among all FDI determinants only government effectiveness and natural resource abundance are important across all countries. This suggests the importance of emphasizing different policies in different countries or country groups. Moreover, our analysis also suggests that the new analytical classification developed in this study can be an important guide for operational and analytical works of continental organizations such as the African Development Bank, the Economic Commission for Africa and the African Union.

Determinants of Foreign Direct Investment Inflows to Africa: Evidence Using A New Analytical Country Classification♣

Alemayehu Geda and Addis Yimer

1. Introduction

Foreign direct investment (FDI) inflows are considered as important stimulants of growth in developing countries by providing investment capital and technology and knowledge spillovers which are necessary for growth in these countries (Akinlo, 2004; Iamsiraroj, 2016).

Assuming FDI would promote growth, African countries have introduced various wide-ranging policies to attract FDI inflows into their economy. FDI inflows to Africa remained very low compared to other developing regions of the world, however. For instance, in 2016, the share of Africa in the Global FDI inflows was only 3 percent. This is insignificant compared to; for instance, the 27 percent developing Asia's share in the global FDI inflows for the same year (see UNCTAD, 2017).

While there exists a large body of literature on the determinants of FDI flows to the developing world in general, little has been done to investigate the determinants of FDI flows to Africa. However, the available cross-country studies on Africa have a number of limitations. First, previous cross-country studies on Africa pool all structurally or characteristically different African countries in one sample (see, e.g., Asiedu, 2002; Onyeiwu and Shrestha, 2004; Asiedu, 2006; Asiedu and Gyimah-Brempong, 2008; Cleeve, 2008; Mohamed and Sidiropoulos, 2010; Mhlanga et al., 2010; Abdoul, 2012; Anyanwu, 2012). Given the fact that countries have different socio-economic, political and institutional conditions, such an approach may lead to misleading inferences due to the resulting problem of unaccounted countries hetroginitey. In this study, in an attempt to overcome this problem, we have developed a new analytical classification of African countries as Investment-driven, Factor-driven, and Fragile based on economic and institutional fundamentals of countries' hetroginiety. Thus, this study differs from earlier studies on Africa by examining whether there exists a variation in the determinants of FDI inflows across such classification. Second, most of the available cross-country studies in African generally focus on economic factors in their attempt to identify locational determinants of FDI inflows to Africa. As a result, most studies overlook the need to consider political and institutional factors in their analysis (see, e.g., Asiedu, 2002; Onyeiwu and Shrestha, 2004; Asiedu and Gyimah-Brempong, 2008; Mohamed and Sidiropoulos, 2010; Mhlanga et al., 2010;

Abdoul, 2012). However, capital inflows to a country do not occur in political and institutional vacuum. Ignoring such important factors in empirical analysis may lead to the problem of model misspecification and omitted variable bias. Thus, given the prevalence of weak and poor quality of institutions in most Africa countries, it would seem that it is rather important for international finance related studies on Africa to take into account this necessity. Third, most of the previous studies on Africa are not theoretically and empirically systematic either. In addition, they typically fail to account for possible cross-sectional dependence in their econometric analyses (see, e.g., Asiedu, 2002; Onyeiwu and Shrestha, 2004; Asiedu, 2006; Asiedu and Gyimah-Brempong, 2008; Cleeve, 2008; Mohamed and Sidiropoulos, 2010; Mhlanga et al., 2010; Abdoul, 2012; Anyanwu, 2012). Furthermore, most of them do not consider the importance of modeling the possibility of long-run relationships between the variables of their study (see, e.g., Asiedu, 2002; Onyeiwu and Shrestha, 2004; Asiedu, 2006; Asiedu and Gyimah-Brempong, 2008; Cleeve, 2008; Mohamed and Sidiropoulos, 2010; Mhlanga et al., 2010; Abdoul, 2012; Anyanwu, 2012).

This study tries to address these gaps by developing a new analytical country classification which takes into account cross-country differences. Thus, this study re-examines the determinants of FDI inflows to Africa for the period 1996-2012 using a panel cointegration approach based on a new analytical classification of African countries as investment-driven, factor-driven and fragile economies. It also offers an in-depth theoretical analysis of the literature on the determinants of FDI flows. It also accounts for institutional and political factors and tries to address the problem of model misspecification and omitted variable bias that many of the previous studies on the issue may have suffered from. In addition, the issue of long-run relationships (i.e., cointegration) and the problem of the cross-sectional dependence are taken in to account in the empirical modeling of the study.

The rest of the paper is organized as follows. Section 2 presents the general pattern of FDI inflows to Africa. Section 3 presents an overview of the theoretical literature on the determinants of FDI flows to a host country with the aim of coming up with factors behind FDI flows to Africa from systemic (theoretical) perspective. Section 4 discusses empirical regularity about determinants of FDI in existing African literature. Section 5 discusses the new analytical country classification scheme developed in this study. The empirical model employed and the results obtained are discussed in section 6. Section 7 concludes the paper.

2. The Pattern of FDI inflows to Africa

FDI flows to developing economies have reached a new high of US$ 646 billion, accounting for 37 percent of global inflows in 2016. Developing Asia continues to be the region with the highest FDI inflows (Table 1). Africa's share of world FDI inflows has been extremely low. By the second half of the 1990s, the average share of FDI in the GDP of African countries was not

only very small but was also declining. Any positive trends were largely related to investments in countries with newly discovered resources. For instance, in 1996 FDI was a mere US$ 5.5 billion representing only 1.5 percent of global investment flows (UNCTAD, 2017). Its distribution was also extremely skewed with Nigeria, Egypt, Morocco, Tunisia, South Africa, Algeria, Angola, Ghana and Côte d'Ivoire accounting for over 67 percent of FDI receipts to Africa (UNCTAD, 2017). Between 1991 and 1996 ten countries (Nigeria, Morocco, Tunisia, Angola, South Africa, Ghana, Tanzania, Namibia, Uganda and Zambia) received almost 90 percent of the FDI inflows, with Nigeria alone absorbing a third of the amount (UNCTAD, 2017).

Most of the flows emanated from France, UK, Germany and the US. Favored recipient sectors included oil, gas, metals and other extractive industries (UNCTAD, 1998). The total value of FDI inflows to Africa in 2003 was about US$ 18 billion which increased to US$ 59 billion by 2016. This constituted about 3 and 9 percent of world and developing economies' FDI inflows respectively (Table 1). In 2016, the Central Africa region managed to attract about US$ 19 billion while the rest of Africa attracted about US$ 48 billion, divided between 13, 12, 11, and 3 billion US$ for North, East, Western and Southern Africa respectively (see UNCTAD, 2017).

Table 1: FDI Flows by Region (US$ in billions)

Host Region/economy	FDI inflows		
	2014	2015	2016
World	1324	1774	1746
Developed Economies	563	984	1032
Developing Economies	704	752	646
Developing Economies: Africa	71	61	59
Developing Economies: Asia	460	524	443
Developing Economies: Americas	170	165	142
Percentage Share in the total FDI Inflow of the world			
Developed Economies	43	55	59
Developing Economies	53	42	37
Developing Economies: Africa	5	3	3
Developing Economies: Asia	35	30	25
Developing Economies: Americas	13	9	8

Source: UNCTAD (2017).

Intra-Africa investments are also increasing and are dominated by South African, Kenyan and Nigerian firms. According to UNCTAD (2014), between 2009 and 2013, the share of announced cross-border Greenfield investment projects originating from within Africa increased to 18 percent, from less than 10 percent earlier. For many smaller, often landlocked or non-oil-exporting countries in Africa, intra-regional FDI is a significant source of foreign capital flows (UNCTAD, 2014).

FDI flows to Africa from traditional sources and the OECD countries are important in this. Despite the media's focus on China and other emerging economies investing on the continent, the combined share of China and India's FDI to Africa in the total FDI to the continent was just about 6 percent (Geda, 2013). Generally, we note the following points about FDI to Africa in relation to China and India. First, it is highly unlikely that China and India as host countries will divert FDI that will come to Africa. Second, the level of FDI from China and India to Africa is not only very small but also located in a few countries. Third, these flows from China and India are largely motivated by the desire to secure sources of energy and raw materials and the desire to exploit preferential markets which are accessible to African countries (Geda, 2013).

3. Determinants of FDI Flows: The Theory

This section briefly examines various theories on the determinants of FDI. The early neo-classical approach summarized by MacDougal (1960) hypothesized that capital flows across countries are governed by differential rates of return (within the neo-classical market setting). He also argued that such capital inflows were welfare enhancing for both parties engaged in capital movement. The MacDougal model assumes perfect competition, risk-free capital movement, mobility in factors of production and no risk of default. The portfolio approach to FDI, presented as a reaction to the MacDougal model, emphasizes not only a returns differential, but also differences in risk (Agarwal, 1980).

Ohlin (1933) was one of the first to address the determinants of FDI. According to him FDI was motivated mainly by the possibility of high profitability in growing markets along with the possibility of financing these investments at relatively low rates of interest in the host country. Other determinants were the necessity of overcoming trade barriers and securing sources of raw materials. This is strengthened by a theory which emphasizes the positive relationship between FDI and output (sales in the host country) along the lines of Jorgenson's (1963) investment model (see Agarwal, 1980; Geda, 2002).

A major criticism of these theories is that they miss the relevance of market imperfections. Hymer (1960) and Kindleberger (1969) argue that if foreign firms were able to compete and succeed in the host country, then they must be in possession of a specific and transferable competitive advantage both over local firms and other potential entrants into the local markets. Building on Hymer's (1960) analysis Kindleberger (1969) posited that instead of multinational firms' behavior determining the market structure, it is the market structure (monopolistic competition) that determines the conduct of a firm by internalizing its production. Caves (1971), also based on microeconomic analysis of FDI, further added to the link between industrial organization and FDI established by Hymer (1960). He argues that multinational companies invest overseas in order to protect the foreign market from tariffs or other trade related

restrictions imposed by foreign governments. According to Caves (1971), overseas investment goes where trade does not.

This oligopolistic market theory of FDI claims that imperfect competition encourages multinational firms to differentiate products and engage in FDI (Kindleberger, 1969). For this strand of literature, foreign investments reflect the outcome of strategic reactionary behavior between rivalrous companies in the world market following the entry of competitors in certain markets (see Kindleberger, 1969).

Vernon's (1966) provided the 'product-life-cycle' theoretical approach based on the analysis of oligopolistic market behaviors. According to Vernon (1966), the investment decision faced by multilateral firms is a choice between exporting and investing in the foreign market, as products move through a life cycle. In the early stages of a product's life cycle, invention and production of a new product takes place in the developed countries where there is research and development capabilities and growing markets. When the product becomes standardized, technological transfer to firms in developing countries occur and production shifts to the low-wage firms in these economies (Vernon, 1966). Thus, to maximize their profit, multinationals switch from exporting to foreign-based production. Krugman (1979) formalized Vernon's (1966) theory in a dynamic setup. For Krugman (1979), technological innovations are the basis for FDI (Geda, 2002).

Recently, the 'new trade theories', based on the original contributions of Hymer (1960), among others, underscore the importance of specialization in production in explaining FDI (see Geda, 2002).

Based on the original contributions of Hymer (1960) and later by Vernon (1966), Kindleberger (1969), and Caves (1971); Buckley and Casson (1976) extended the industrial organization theory of FDI to include the concept of 'internalization.' Buckley and Casson (1976) based on Coase's (1937) original concept of internalization in theory of the firm; they extended its application to the international firm (multinational companies). They claimed that firms choose to internalize operations through FDI when market transaction costs are high compared to the internalization of operations (see Buckley and Casson, 1976). More generally, in the context of internalization theory of FDI, any form of market imperfection is taken as a rationale for multinational companies to internalize their production and engage in overseas investment (see Buckley and Casson, 1976; Agarwal, 1980; Dunning, 1993). The internalization theory of FDI later became one of the major building blocks on which Dunning's (1993) more integrated and comprehensive theory on the determinants of FDI is established (see Dunning's, 1981, 1988 and 1993). This line of using transaction and related cost internalization as determinants of FDI is also emphasized by Buckley and Casson (1976) and Buckley (1985). Their arguments run mainly on the fact that transaction costs of intermediate products will be minimized when

markets are integrated by multinational firms (MNFs). They argue that MNFs have proprietary assets regarding marketing, designs, patents, trademarks and innovative capacity among others (that is, ownership advantages) whose transfer may be costly for being intangible assets or due to a good sense of opportunity or even because they are diffused and thus difficult to sell or lease. According to Buckley and Casson (1976) and Buckley (1985), the main strength of the internalization theory is its capacity to address the dilemma between the licensing of production to a foreign agent and own production that can be done through FDI.

Dunning's (1981, 1988, 1993) comprehensive theoretical framework, termed as the eclectic approach, contributed to the determinants of FDI literature by bringing together a number of complementary FDI theories that attempt to explain the location decision of multinational firms when they opt for a particular place for their outside investment (see Geda, 2002). This approach is also in line with Porter's (1990) notion of 'competitive advantage' where firms are believed to engage in FDI to amplify their home-based advantages and offset home-based disadvantages through global strategies that tap selectively into the advantages available in other nations including big markets, economies of scale, costly domestic policies and global networks that add to and sustain home-base advantages.

The OLI approach provided a micro-macroeconomic approach based on ownership, location and internalization (OLI) advantages to analyze the determinants of FDI. According to this theory, FDI is advantageous when there are simultaneously advantages of OLI. Ownership advantages are firm-specific competitive advantages which an investing firm possesses over local firm in serving particular markets. It includes the possession of a certain valuable and organizationally embedded resources such as, among others, patents and marketing and managerial knowhow. The location advantage arises when a company benefits from its presence in a given market as a result of specific advantages that host country offers for foreign investors. These advantages can be simply geographical (proximity to a larger market) (Porter, 1990), be present because of the existence of cheap and abundant factors of productions (such as natural resources, energy, labor, and other raw materials), or can come about due to policy-related incentives (such as special preferential tax rights and tariffs, low cost access to land) (Dunning, 1993). The internalization advantages relate to the concept of transaction costs minimization that may arise due to market imperfections in alternative modes of entry into a particular market. FDI will occur when investing companies choose to exploit their ownership and location advantages through internalization (Dunning, 1993). The OLI paradigm is popular in empirical applications due to its comprehensiveness and coherent integration of complementary FDI theoretical approaches for investigating the determinants of FDI (Helleiner, 1989).

Another strand of literature, which is often overlooked in mainstream analyses, is Marxist theories of FDI determination. Citing historical and other empirical evidence from Britain and the United States, Baran and Sweezy (1966) argue that FDI represents an outlet for investment-seeking

surplus resulting from stagnation in the centers of capitalism. According to Marxist theories, FDI also represents a mechanism for extracting surplus from under-developed areas (Baran and Sweezy, 1966). Magdoff (1992) argues that the 1970s and 1980s exhibited a slowdown in economic activity which itself is an inherent feature of capitalism according to Marxist theory and that this slowdown spurred capital to seek and create new profit opportunities. Thus, the speeded-up flow of direct investments from one country to another is seen as a reaction to stagnation in capitalist centers. According to Magdoff, the 1980s witnessed world FDI growing at an average annual rate of 29 percent and the pattern of such investments increasingly switching to finance and insurance, real estate, advertising and the media (as opposed to the traditional sectors of manufacturing and raw material extraction). Despite such changing patterns, Magdoff saw stagnation in the centers and the search for profit as representing the main reasons for FDI.

To sum up, there are a number of theoretical frameworks to explain the location determinants of FDI. However, all are not equally applicable to Africa. For instance, the neoclassical theory of FDI is less relevant in Africa than in many other areas due to its perfect-markets assumption. Krugman's theory is also less useful for Africa than in many other areas. It is more relevant in countries where there are better initial conditions for industrial expansion such as countries in East Asia. The deterioration in terms of trade in Africa till 2002, combined with the debt crisis of the 1980s and 1990s, greatly undermines the relevance of this theory in the African context. The most probable theoretical explanation seems to be found in the Marxist version and in the 'eclectic' explanations that are based on 'industrial organization' and 'the international firm' perspectives.

The Marxist version focuses primarily on the consequences of FDI, which is not the prime focus of our empirical study. Besides, its stagnation thesis may not fully explain FDI destinations as much as its sources and might also be inferred from theories based on industrial organization and multinational firms. Dunning's eclectic paradigm, on the other hand, is a better candidate to explain FDI in African states. The abundance of natural resources and low-cost factors of production, the path-dependent nature of such flows based on colonial history (see Geda, 2002), and the wide range of policy related incentives that African countries provide for foreign investors make Dunning's OLI framework relevant for explaining FDI into the continent. Thus, in specifying the FDI model to be estimated in the next section, we have used this OLI theoretical approach.

4.   Determinants of FDI Flows to Africa: Recent Evidence

Empirical literature on the determinants of FDI to LDCs is voluminous and is based both on country case studies (see, e.g., Khan and Bamou, 2006; Seetanah and Rojid 2011) and cross-section analyses (see, e.g., Root and Ahmed, 1979; Asiedu, 2002, 2006; Anyanwu, 2012). An

examination of the findings of these studies and how they are related to the theories reviewed earlier is informative for the approach in our study.

The findings from existing studies generally reveal that labor costs, country size, openness, the exchange rate regime, returns on investments, human capital and political factors are among the most important factors explaining FDI flows (see Table 2 for a summary). Notwithstanding these general findings we focus on the evidence found in African studies[1] which offer some insights into the empirical analysis conducted in this study.

Table 2: Result of Recent Empirical Studies on Major Determinants of FDI Flows to Africa (and other Developing Countries)

Determinant	FDI Destinations	Method	Proxy	Effect	Author(s)
Market size	12 MENA, 24 DCs	Panel data	GDP	+	Mohamed and Sidiropoulos (2010)
	14 SADC	Panel data	GDP	+	Mhlanga et al. (2010)
	16 SSA countries,	Multivariate regression	GDP per capita	+	Cleeve (2008)
	22 SSA countries,	Panel data	GDP	+	Asiedu (2006)
	Africa (SSA and North Africa)	Panel data	urban population, as per cent of total population and GDP per capita	+	Anyanwu (2012)
	SSA and 6 other non-SSA African countries,	Panel data	total population	+	Abdoul (2012)
	DCs	Correlation analysis	Population	+	Nunnekamp (2002)
Openness of the economy	16 SSA countries,	Multivariate regression	(X+M)/GDP	+	Cleeve (2008)
	29 African Countries,	Panel data	(X+M)/GDP	+	Onyeiwu and Shrestha (2004)
	14 SADC	Multivariate regression	(X+M)/GDP	+	Mhlanga et al. (2010)
	12 MENA, 24 DCs	Panel data	(X+M)/GDP	**0**	Mohamed and Sidiropoulos (2010)
	SSA & North Africa,	Panel data	(X+M)/GDP	+	Anyanwu (2012)
	22 SSA countries,	Panel data	(X+M)/GDP	+	Asiedu (2006)
	SSA and 6 other non-SSA African countries,	Panel data	(X+M)/GDP	+	Abdoul (2012)
	DCs	Correlation analysis	(X+M)/GDP		Nunnekamp (2002)

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[1] The empirical discussion presented here does not discuss the findings from country case studies in Africa. However, country case studies in Africa reported a similar result to the cross-sectional studies in Africa (see Geda and Yimer, 2015).

Factor endowments in natural resources	22 SSA countries,	Multivariate regression	X fuels+minerals/total X	+	Asiedu (2006)
	12 MENA, 24 DCs	Multivariate regression	X fuels/total X	+	Mohamed and Sidiropoulos (2010)
	14 SADC	Multivariate regression	Investment in extractive industry (dummy)	**0**	Mhlanga et al. (2010)
	29 African countries,	Panel data	X fuels/total X	+	Onyeiwu and Shrestha (2004)
	Africa (SSA and North Africa)	Panel data	Oil exporters represent dummy for net oil exporters,	+	Anyanwu (2012)
Macroeconomic Stability	14 SADC	Multivariate regression	Inflation rate	**0**	Mhlanga et al. (2010)
	22 SSA countries	Panel data	Inflation rate	-	Asiedu (2006)
	12 MENA, 24 DCs	Panel data	Inflation rate	-	Mohamed and Sidiropoulos (2010)
	29 African countries	Panel data	Inflation rate	-	Anyanwu (2012)
	16 SSA countries	Multivariate regression	Inflation rate	-	Cleeve (2008)
Governance Indicators	22 SSA countries	Panel data	Effectiveness of the Government Index (ICRG)	+	Asiedu (2006)
	16 SSA countries	Multivariate regression	Corruption index	-	Cleeve (2008)
	African countries	Panel data	Rule of Law Index(IGRC)	+	Anyanwu (2012)

Note: DCs is Developing Countries; MENA is Middle East and North African Countries; SSA is Sub-Saharan Africa; SADC is Southern Africa Development Community; X is Exports and M is Imports.

Most studies on Africa report that FDI to the continent was largely motivated by natural resource endowments (see, e.g., Asiedu, 2006; Asiedu and Gyimah-Brempong, 2008; Basu and Krishna, 2002; Morisset, 2000). Though natural resource abundance is a common factor explaining much of the FDI inflows, a few successful African countries have also managed to attract FDI by creating a favorable economic, social and political environment. For instance, Mauritius and Seychelles have managed to attract FDI by tailoring their FDI policies through liberalization, export orientation, tax and other investment incentives. Moreover, some countries like Lesotho and Swaziland have attracted FDI because they are near South Africa and investors wishing to serve the large market in South Africa have located their subsidiaries in these countries (Basu and Krishna, 2002; UNCTAD, 1998).

Asiedu (2002) analyzed 34 countries in sub-Saharan Africa over the period 1980-2000. Using a panel data analysis she found that openness to trade, higher income and better growth prospects and a better institutional framework and infrastructure were 'rewarded' with more investments. A later study by Asiedu (2006) shows the significant role of a country's market size and natural

resource endowments in enhancing FDI. She found greater literacy in the population, lower inflation, more openness, better infrastructure, good quality of the rule of law and political stability, and lower levels of corruption to have positive effects on FDI flows to the continent. Asiedu and Gyimah-Brempong (2008) validate these finding to a large extent and note that countries that are small or lack natural resources can attract FDI by improving their institutions and policy environments.

Based on a co-integration analysis for the period 1970-2000 using data from 19 sub-Saharan African countries, Bende-Nabende (2002) found market growth, export-oriented policies and liberalization were the most dominant long-run determinants of FDI in Africa. Using fixed and random effects models on a panel dataset for 29 African countries over the period 1975-99, Onyeiwu and Shrestha (2004) identified economic growth, inflation, openness of the economy, international reserves and natural resource availability as important determinants of FDI to Africa. Contrary to conventional wisdom, political rights and infrastructure were found to be unimportant in their study. Krugell (2005) also empirically tested for the significance of a number of hypothesized determinants of FDI in sub-Saharan Africa. The pooled cross-country and time-series estimation covered the period 1980-99 for 17 countries. Krugell's results are in line with the findings mentioned earlier, particularly with respect to economic growth and openness.

Dupasquier and Osakwe (2006) identified factors such as political and macroeconomic instability, low growth rate, weak infrastructure, poor governance, an inhospitable regulatory environment and ill-conceived investment promotion strategies as being responsible for the poor FDI record of the region. Naude and Krugell (2007) employed a cross-country econometric approach using a dynamic one-step generalized method of moment's estimator in their study. They identified government consumption, inflation rate, investment, governance and initial levels of literacy as being important. The authors concluded that geography did not seem to have a direct influence on FDI flows to Africa. Neither market-seeking nor re-exporting motives of FDI seemed to be the major determinants of FDI in their study. However, institutions in the form of political stability showed up as a significant determinant of FDI to the continent.

Among the most recent FDI studies on Africa, Abdoul (2012) estimates a model of FDI determination using a five-year panel data with the system-GMM technique over the period 1970-2009 for 53 African countries. He found that larger countries attracted more FDI. However, regardless of their size, more open and politically stable countries that offered higher returns on investments also attracted FDI. FDI inflows were also found to be persistent in the sense that countries that manage to attract FDI today are likely to attract more FDI in the future. Using cross-country data for 53 African countries for the period 1996-2008 Anyanwu (2012) found market size (whose proxy is urban population as percentage of total population and GDP per capita of the host country), openness to trade, rule of law, foreign aid, natural resources and past

FDI inflows (increased agglomeration) to have a positive effect on FDI inflows. He also found that domestic financial developments had a negative effect on FDI inflows.

In sum, market size, openness of an economy, natural resource endowments and political and macroeconomic stability are important determinants of FDI flows to Africa. We believe that these are important factors that any model on the determinants of FDI flows to Africa needs to consider. However, when examined in the light of theoretical literature on FDI, none of these African studies seem to formulate their empirical models by explicitly following one strand of the theoretical literature or the other. The variables used in their models, however, suggest the use of Dunning's eclectic paradigm without stating which variable is used as a proxy for which theoretical concept. This is partly the result of missing theoretical discussions and formulations in almost all these studies.

One important area emphasized in theory but not well addressed in the studies discussed earlier relates to the location of the 'eclectic paradigm' in the OLI framework. However, the effects of major determinants of FDI identified in African empirical literature vary across countries or groups of countries – thus location matters. We believe this is an important omission and some analytical classification of countries could be an important indicator of the location issues emphasized in the OLI theoretical framework. Thus, FDI models need to be fitted to different country groupings and these groupings need to be formed using rigorous analytical classifications.

With this perspective, in the model developed and estimated in our study, the modeling of the determinants of FDI inflows to Africa is framed in a new country classification framework. Moreover, in addition to incorporating broader governance indicators we also use longer data series and a panel error correction modeling (ECM) technique that accounts for cross-sectional dependence which is missing in existing African literature.

5. A New Analytical Country Classification

Country classification schemes are important both for analytical and operation activities of international and regional developmental organizations such as the World Bank and the African Development Bank (AfDB). A recent study by Brixiova and Ndkumana (2011) for AfDB proposes a new country classification for Africa. The authors' proposed a classification scheme for Africa that is based on four criteria: (a) level of income, (b) growth acceleration and resilience, (c) a robust macroeconomic framework and macroeconomic stability, and (d) an enabling business environment and private sector driven growth. However, the proxies used to measure these criteria are not clearly articulated in the study. Although the Brixiova-Ndikumana classification provides a fresh perspective on African country classifications, it is not a concrete proposal that can readily be used either for operational (except perhaps the fragile states

category) or analytical work. This is because first, the stages of development used are not characterized in terms of their salient features except at the general impression level (like having a stock market and credit ratings). Second, it does not have systematic and quantifiable proxies that can be used for the purpose (except a limited use of per capita income). Third, it does not have a clear analytical basis for the classification. Finally, there is no dynamic and measurable story that indicates that one stage surely follows or precedes the other (say, along the Rostovian line of the 'dynamic theory of production'). Notwithstanding these weaknesses, it is an important starting point for the classification of African economies. It also offers an opportunity to build on this initiative and come up with a useful classification that is appropriate both for operational and analytical work on the continent. We make an attempt to do this and this also informs the FDI model estimated in our study.

Literature on the classification of countries by level of development (sometimes referred to as 'stage theories') is rife with debates and unsolved issues. Prominent contributions range from the two famous and dominant classifications scheme of stages of development,[2] Marxian and Rostovian, to that of Michael Porter's relatively recent effort. See Figure 1 for a comparison of these three classification systems and the discussion below.

Marxian stages of development emphasize the historical development of socialism where by one stage follows necessarily from primitive mode of production and necessarily develop into the next, until socialism is attained in the end of the process. Departing from the dominant Marxian discourse on stages of development at the time, Rostow (1960) offers a somewhat different classification of the 'stages' of economic development.

Some of the major weaknesses of the Rostovian approach which is relevant for our topic relates to Rostow's failure to elaborate more on the concept of 'stages' (defined as a concept indicating the discontinuous aspect of growth), the meaning of 'sequence of stages' (defined as indicating the continuous aspect of growth) and 'periodization.' He also fails to make an effective application of the 'dynamic theory of production' that he claims to use as an apparatus of stage analysis (see, Itagaki, 2007). In short, Rostow's analysis fails to impress his critics regarding the dynamic force that links one stage to the other or what Rostow called 'the inner logic of continuity: the analytic bone-structure.' According to Rostow, this sequence is rooted in a dynamic theory of production and leading sector analysis (see Rostow, 1959, 1960). This notion was revisited by Michael Porter in the 1990s. Unlike Rostow, Porter's classification scheme has a lot to offer in classifying African countries at various stages of development.

Porter's (1990) classification of countries is based on his work *The Competitive Advantage of Nations* where he examines the pattern and characteristics of industrialization and exports in the global market place. For Porter each stage of development represents the development of

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[2]This section does not pretend to be exhaustive on the stages of development theory.

different industries and industry segments as well as the required policy and company strategy (Porter, 1990: 545). He structured his stages in such a way that the ability to transit from one stage to the other is a function of a country's relative position in the global market where without the ability to export, the level of production and productivity will not rise (Porter, 1990:545). It is on the basis of this notion that his stages of development (see Figure 1) are outlined.
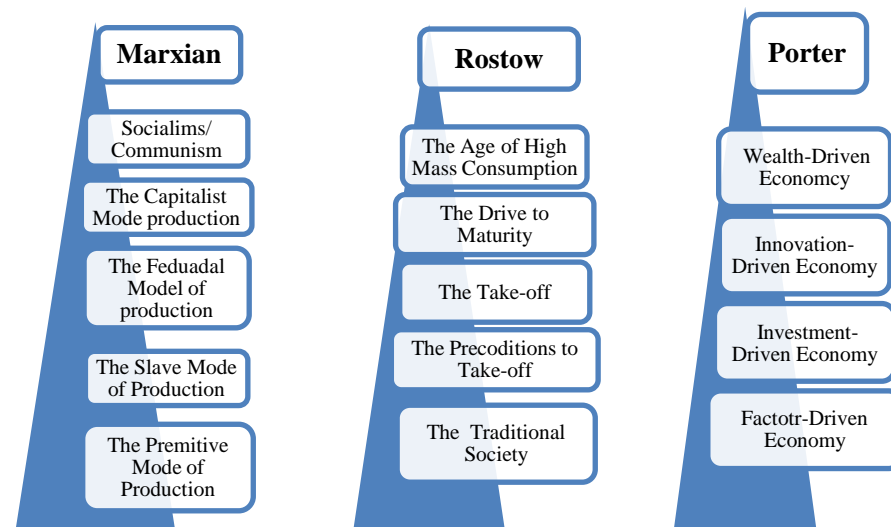
Figure 1: Summary of Literature on an Analytical Basis for Classifications

In contrast, the literature in this area does not have an analytical classification of African countries. A recent comprehensive study of the political economy of growth in Africa by Fosu (2008) identified four political regimes that characterized the political and policy landscape of post-independence Africa – a potential basis for an analytical classification. The regimes are: the State Controls (SC) regime, the Adverse Redistribution (AR) regime, the Inter-temporally Unsustainable Spending (IUS) regime and the State Breakdown (SB) regime; also presented is the complementary Syndrome-Free (SF) category (Fosu, 2008). The study notes that the quality of economic policies pursued by each of these regimes had a powerful effect on whether countries seized the growth opportunities offered by global technologies and markets and by their own initial conditions (Fosu, 2008). According to Fosu (2008), this syndrome-based classification aggregates a multi-dimensional policy into broad patterns that occur repeatedly in African countries. The evidence that syndromes reduce growth is strong in the AERC study. According to Fosu and O'Connell (2006) being syndrome-free can add as much as 2.5 percentage points per year to per capita growth. While this classification is used for a policy analysis, the same AERC study also comes up with an analytic-cum-geographic classification. This classification finds justification in the belief that the potential for growth in the continent is strongly associated with endowments and location (Collier and O'Connell, 2008). As a result

countries in Africa are also classified in the AERC study as 'land locked,' 'coastal,' and 'resource rich.'

These two classifications (policy opportunity/syndrome and geography) can also be mapped together (Fosu, 2008). In this mapping we note, for instance, that state breakdown is common in landlocked economies while coastal economies are generally free from this. Further, all geographic locations are characterized by the syndrome of being regulatory and redistributive. However, this facet is more dominant in resource rich economies. Although AERC's analytic approach is excellent it is beleaguered by the same flaws as earlier studies (that is, it fails to show the trajectory of development stages for countries examined in the case studies) although the implicit assumption in the study is a 'syndrome free' status as the best direction. This makes the AERC classification fundamentally driven by policy analyses. This leaves economic dynamics and shifts in the growth frontier as a result of higher productivity largely untouched.

Finally, it is worth looking at the classifications of global financial market players, partly because the Brixiova-Ndikumana classification for Africa categorically borrows archetypal group names (such as 'emerging markets' and 'frontier markets') from that domain. For instance, Standard and Poor's (S&P) Global Broad Market Index (BMI) classifies countries as 'developed, 'emerging' and 'emerging plus' based on the relative size and performance of global stock markets. The motivation behind S&P's classification is gauging the global financial market. S&P uses quantitative criteria as well as the opinions and experiences of global investors. Standard and Poor's (2011) notes that many of the issues in determining if a market is developed, emerging or frontier are not amenable to quantitative decisions. Regulations, rules and procedures for foreign exchange trading, trade settlements, availability of company financial data and other factors as well as operating costs imposed on investors by these factors vary from market to market and determine the classification of countries (see Standard and Poor's, 2011).

With regard to the relevance of adopting this global financial market based classification in Africa we note that if a country does not have publicly listed companies (with a market capitalization value of over US$ 100 million), classifications such as 'emerging' and 'frontier' are not usable and hence their usage (as in the case of Brixiova and Ndikumana's study) is problematic. In fact, Standard and Poor's (2011) classification shows only Egypt, Morocco and South Africa as 'emerging markets' in Africa; the rest of Africa is totally absent from all S&P's categories.

The broad lesson from the analysis so far is that a classification of countries by stages of development is an important matter for developmental institutions in Africa and also for analytical work on the continent. This is because countries at various stages of development face different challenges and exhibit diversified outcomes. This may entail different policy and assistance strategies that suit each of the stages (see Brixiova and Ndikumana, 2011; Lin, 2011;

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Porter, 1990). If such a classification is important, what then is the lesson from literature for classifying African countries and what should be the criteria for them? For analytical work such as a FDI analysis in our study, the following criteria are important for classification of African countries into different categories:

a) The classification needs to be guided by an attempt to capture the salient structural features of African economies in the global economy context including the position of its leading sectors.

b) The classification needs to be informed by an indication of the existence of levels or stages of development governed by an inner logic of production and export dynamism in each country. It also needs to be forward looking.

c) The classification should be helpful in identifying challenges and evaluating outcomes which are believed to be different at different stages of development and hence call for different intervention strategies.

d) Finally, as much as possible the classification should be quantifiable to avoid arbitrariness.

Building on Porter's (1990) work, which methodically adheres to criteria similar to those mentioned here and providing an excellent framework for depicting the stylized facts of countries, we propose an alternative classification scheme for African countries. The main principle behind this classification is that each stage is a step in the productivity ladder which is qualitatively different in its structure. This could be inferred from the uniqueness of its product sophistication and productivity level in the global economy and market context. A globally competitive position is also an indirect measure of domestic economic sophistications once an economy has moved out of, say, the factor-intensive stage of a competitive advantage position. Hence, one stage follows the other in a linear or non-linear way following a qualitative change in a country's economic structure and its accompanied socio-political (soft) and physical (hard) infrastructure.[3] This conceptualization relies heavily on the pattern of trade because this is invariably the best measure of sophistication of the domestic economy and hence a derived indicator of the relative position of a country vis-à-vis other economies in the world. Benchmarked with East Asia's fast-growing economies (such as China, South Korea and Taiwan), such a scheme for Africa will help us see the diversity among African economies. Thus, primarily relying on Porter (1990) we outline and briefly define the following four

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[3]The notion of hard infrastructure refers to the prevailing state of rationality, science, technology, the mode of organization and the degree of human development (human capital formation). Soft infrastructure refers to the corresponding distribution of income and levels of poverty, the social conditions under which production takes place, the mode of thought, ideology, culture and global perspective of citizens (see Geda, 2002 and Lin, 2011, among others).

categories for Africa. These are also summarized, together with their possible proxies, in Table 3.

i)   *Factor-Driven African Economies (Aspiring African Economies: Class A and B)*: African economies whose source of competitive advantage in the global economy comes from basic factors such as labor and other natural resources. Here technology is pretty much standard and at best imitated and competition by countries in this stage is sustained through prices. The peculiar feature of countries in this stage is the sensitivity of such economies to world economic cycles, exchange rates and interest rate movements and their effect on commodity speculators as well as the loss of factor advantages. This stage is relevant for a majority of African countries. It can also be further divided into agricultural (Class A) and non-agricultural (Class B) factor-driven categories as the former is unique and dependent on climate change. In our study we use them as one category.

ii) *Investment-Driven African Economies (Emerging African Economies):* African economies with the ability and willingness to absorb and modify the best available technology through large investments and those who have made themselves competitive in the global economy. Like the factor-driven stage the competitiveness in this stage comes from standardized and price sensitive commodities.

iii) *Innovation-Driven African Economies (Advanced [or Frontier] African Economies):* African economies which have created unique value for their firms and cluster of firms that gives them an edge over competitors in the global market. They are also at the world technology frontier with regard to the goods they supply to both large domestic markets and the global economy.

iv) *Fragile and Post-Conflict African Economies*: African economies characterized by a debilitating combination of weak governance, policies and institutions indicated by their ranking among the lowest (< 3) on the World Bank's country's policies and institutional performance assessment (CPIA) index. These are states that have failed to provide comprehensive service entitlements to their citizens and lack authority and legitimacy owing to the failure of either capacity or political will or both. This category also entails differing policy needs and assistance compared to countries that are similar in every respect. One distinguishing characteristic is that there is a high(er) risk of reverting back into conflict. Economic performance has an important effect on the weight of this risk. Therefore, economic policy has the *additional* potential of helping reduce the risk of reverting into conflict.

Table 3: Suggested Proxies for Empirical Application of the New Country Classification

Country's Stage of Development	Suggested Proxies for measuring the Stage
(a) Innovation-Driven African Economies (Advanced [frontier] African Economies)	• R&D Spending as per cent of total government • spending and also as per cent of GDP • Number of patent applications (as proxy for innovation) • Number of leading global companies • Tertiary education enrolment share, gross • secondary education enrolment share, gross • internet users per 100; mobile users (per 100) • Private Sector Development (Entrepreneurship: stock market value) • Competitive Democracy (Governance Indicator) • GDP per capita (in US$) (All Proxy indicators above should be benchmarked/comparable to the level attained by East Asian countries or a sample of them such as China, India and Taiwan)
(b) Investment-Driven African Economies (Emerging African Economies)	• Investment (GCF) as share of GDP • Gross Domestic Saving (share of GDP) • FDI as share of GDP • Manufacturing sector as the share of GDP • Manufacturing Export as the share of total exports • Existence of Stock Market and Listed companies • Stable Macroeconomic Regime (inflation, CAD and Fiscal deficit per cent GDP) • Private Sector Development (entrepreneurship: stock market value) • Competitive Democracy (governance indicator) • Road, km; Rail and Mobiles per 100 people (All Proxy indicator above should be at least half the level attained by East Asian countries or a sample of them such as China, India and Taiwan)
(c) Factor-Driven African Economies (Aspiring African Economies) **(C1) Agricultural Commodity Driven Economies (Class A)** **(C2) Non-Agricultural Commodity Driven Economies (Class B)**	• Share of primary commodities in total exports >75 per cent • Share of manufactured exports in total exports <25 per cent • Road, rail and mobile per capita (< half of East Asia) • Agricultural commodity exports >75 per cent of exports • Agriculture in GDP (above 40 per cent) • (Non-Agricultural Commodity Exports > 75 per cent of Exports) • Agriculture in GDP (below 40 per cent)
(d) Post-Conflict and Fragile African Economies	• lowest (<3) country policies and institutional performance assessment (CPIA) index value • Uncompetitive democracy • Emerged from conflict (less than 10 years) • Existence of active rebellion

Our classification system for analytical macroeconomic analysis and cross-country econometrics work on Africa has various implications. First, both from the operational and analytical perspective the 'fragile states' group is important. This group has unique features that require

unique analyses, interventions and hence financing mechanisms. Thus, macroeconomic and international economic analyses such as the one conducted in our study need to consider this group as an important and unique category.

Second, non-fragile states in Africa make up other categories of countries with a different set of economic characteristics and challenges. At specific periods in time, each country may find itself at different stages on the ladder of growth and development. These economies also have unique developmental challenges and financing needs at the various stages of their development (from the factor-driven stage to the 'innovation-driven' stage). This underscores the need to take them as another unique analytical category. This helps us to come up with appropriate development policies including different financing schemes and financing instruments that are suitable to each group of countries.

Finally, all these categories need to be analyzed and understood in the context of a dynamic global economy where the trade and financing patterns of African countries are fast changing. For instance, the last decade shows a surge in Chinese and Indian economic engagement on the continent. They are in the course of significantly replacing the traditional dominant role of OECD countries as a source and destination of trade (market) and finance. Thus, analytical work such as ours and the accompanying modeling strategy needs to bring this issue onboard. This is what we attempt in our modeling of FDI flows to Africa as the nature of FDI for each category of countries may have different motivations and attractiveness criteria that are unique for each category.

6. The Empirical Methodology and Findings of the Study

Based on 1996-2012 annual data for 42 African countries from the World Bank (2014a, 2014b, 2014c, 2014d) and UNCTAD (2014), this section presents panel-estimation results for how FDI flows to African countries are determined within three of the economic categories described in the previous section. The next subsection presents the econometric approach and definition of variables used in the empirical modelling and the one after that discusses the findings of the study.

6.1 The Econometric Approach and Definition of Variables

In this study, we have followed the Johansen (1988, 1991) approach to estimate the empirical cointegration model.

Based on the empirical evidence from earlier studies and economic theory and data availability, the estimated equation of our long-run FDI model is given as:

$$logFDI_{it} = \beta_0 + \beta_1 logRGDPPC_{it} + \beta_2 logINVGDP_{it} + \beta_3 logRES_{it} + \beta_4 logEXTDEBGDP_{it}$$
$$+ \beta_5 OPNESS_{it} + \beta_6 logRER_{it} + \beta_7 INF_{it} + \beta_8 POLSTAB_{it} + \beta_9 GOVEFFE_{it}$$
$$+ \varepsilon_{it} \qquad (1)$$

The indices 'i' and 't' refer to country and time respectively. RGDPPC is real GDP per capita; RES is a measure of natural resource abundance; INVGDP is domestic investment as a percentage of GDP; OPNESS is the ratio of trade (exports + imports) to GDP; EXTDEBTGDP is external debt as a percentage of GDP; RER is the real exchange rate; INF is inflation; POLSTAB is political stability; and GOVEFFE is government effectiveness.

If all the variables in Eq. (1) follow panel unit root processes, and the process for the residuals in Eq. (1) is stationary, then Eq. (1) represents a panel cointegration model (Li and Lin, 2016). Thus, a panel error correction model that incorporates the long-term relationship in Eq. (1) can be given as

$$\Delta logFDI_{it} = \theta_1 ec_{i,t-1} + \delta_1 \Delta logRGDPPC_{it} + \delta_2 \Delta logINVGDP_{it} + \delta_3 \Delta logRES_{it}$$
$$+ \delta_4 \Delta logEXTDEBGDP_{it} + \delta_5 \Delta OPNESS_{it} + \delta_6 \Delta logRER_{it} + \delta_7 \Delta INF_{it}$$
$$+ \delta_8 \Delta POLSTAB_{it} + \delta_9 \Delta GOVEFFE_{it} + u_{it} \qquad (2)$$

where the error correction term, $ec_{i,t-1}$, is the residual of the long-term relationship (the estimated ε_{it}); θ_1 is the short-term adjustment coefficient; and Δ is the first difference of the respective variables.

In specifying our empirical model given above, we used the theoretical lines of Porter (1990) and Dunning's (1981, 1988, 1993) 'eclectic theory' of OLI advantages as determinants of FDI flows to Africa. Our analytical classification of African economies as investment-driven, factor-driven and fragile economies is presumed to capture the location advantage which is unique to each category of countries. Hence, the model is estimated for the three categories of countries discussed in the previous section. In addition to location advantage, Dunning's ownership and internalization advantages that may attract FDI to Africa can be proxied by market size, natural endowments and a stable macroeconomic and political environment as African empirical literature in the previous section shows. Thus, we used these variables as part of our empirical model given above.

Market size (RGDPPC): The size of the host market which also represents the host country's economic conditions and potential demand is an important element in FDI decision-making. According to Scaperlanda and Mauer (1969) 'the size-of-market hypothesis is that foreign investment will take place as soon as the market is large enough to permit the capturing of economies of scale.' This is akin to the concept of the 'I' in the OLI framework. The importance

of market size has been confirmed in many previous empirical studies (see, e.g., Schneider and Frey, 1985; Wheeler and Mody, 1992). Thus, following literature we used real GDP per capita as a proxy for market size. Its expected sign is positive. The data for this variable is taken from the World Bank (2014a, 2014c).

Domestic investment as a percentage of GDP (INVGDP): Literature suggests that the availability of strong domestic investments should improve a country's position in the eyes of foreign investors. As noted by Ndikumana and Verick (2008), higher levels of private investments can help attract FDI inflows possibly due to a signaling effect as higher private investments are seen as an indication of high returns to capital. Higher levels of public investments, particularly in areas like infrastructure, are expected to reduce production and trade costs and hence provide a more profitable environment for foreign investors by raising FDI's marginal productivity. Thus, the expected sign for this variable is positive. The data for this variable is taken from the World Bank (2014a, 2014c).

Natural resource abundance (RES): The availability of natural resources might be a major determinant of FDI for the host country. Foreign firms embark on vertical FDI in the host country to produce raw materials or/and inputs for their production processes at home. This means that certain FDI may be less related to profitability or market size of the host country. As posited by the eclectic theory, other things remaining the same, countries that are endowed with natural resources will receive more FDI in line with OLI advantages. As noted by Asiedu (2002), very few studies on FDI's determinants control for natural resource availability. The failure to do so may cause the estimates to be biased. We therefore included the share of minerals and oil in total merchandise exports of a country to capture the availability of natural resource endowments. This measure of natural resources has been employed in previous studies on FDI (see, e.g., Asiedu, 2002, 2006). The data for this variable is taken from the World Bank (2014a, 2014c).

Openness (OPNESS): Openness to international trade as an indicator of the importance of trade for an economy is regarded as a very important factor that promotes FDI. This proxy is also important for foreign direct investors who are motivated by the export market potential of the host country. Empirical evidence (see Table 2) shows that higher levels of exports lead to higher FDI inflows. In Africa, for example, export-oriented economies such as Egypt, Mauritius, Morocco and Tunisia have tended to attract large amounts of FDI in their textiles and apparel industries (Ancharaz, 2003). Following literature (see Table 2) we used the ratio of trade to GDP as a measure of a country's openness.[4] The data for this variable is taken from the World Bank (2014a, 2014c).

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[4] In addition, an alternative variable for trade openness computed as trade share adjusted for population size is also used. Although not reported here, the results from using this variable are similar to the one reported here.

External debt as a percentage of GDP (EXTDEBTGDP): A higher level of indebtedness is considered a component of financial risk influencing FDI inflows negatively (Braga Nonnenberg and Cordoso Mendonca, 2004). Higher transfer risks may cause foreign capital to move out of a country and new FDI flows to be re-routed to safer locations. We used the debt to GDP ratio as a measure of indebtedness and its expected sign is negative. The data for this variable is taken from the World Bank (2014b).

Real exchange rate (RER): The effect of changes in exchange rates on FDI flows is ambiguous. For instance, Elbadawi and Mwega (1997) used the real exchange rate as an indicator of a country's international competitiveness, hypothesizing that a real depreciation would attract larger FDI flows. However, it may be argued that a real depreciation increases the costs of imported inputs and reduces the foreign-currency value of profit remittances, both of which have adverse effects on the profitability of FDI projects (Asiedu, 2002). This effect will dominate if FDI is undertaken primarily to serve the domestic market. Thus, the expected sign for this variable depends on the type and motive of FDI coming to the region. The data for this variable is taken from the World Bank (2014a, 2014c).

Inflation rate (INF): Is generally used as a macroeconomic instability indicator which could affect FDI negatively (see, e.g., Asiedu, 2002). More stable economies that reflect a lesser degree of uncertainty attract more FDI (Elbadawi and Mwega, 1997). Thus, the expected sign for this variable is negative. The data for this variable is taken from the World Bank (2014a, 2014c).

Political stability (POLSTAB): It is argued that 'political instability may disrupt the economic process and affect in particular foreign investment' (Schneider and Frey, 1985). We used a political risk rating provided by the World Bank (2014d) as a proxy for political stability.

Government effectiveness (GOVEFFE): Finally, in order to take account of the impact of the institutional quality of a host country on FDI inflows we included an index of institutional quality using data on 'government effectiveness' compiled by the World Bank (2014d). This variable captures the government's ability and credibility to formulate and implement sound policies and regulations that promote private sector development. We argue that excessive and inefficient bureaucracy raises the costs of doing business and offers opportunities for corruption thereby deterring FDI inflows.

6.2   *Findings of the Study*

This section empirically investigates the determinants of FDI inflows in investment-driven, factor-driven, and fragile African countries. The results from estimated panel error-correction models for each of the country groupings are presented Table 4. The results generally suggest

that the various factors determining FDI had a different effect in each country depending on the analytical category in which the country was located.

The estimation of the models was preceded by all the necessary pre-estimation diagnostic tests including second generation unit root and co-integration tests that are valid even if there exists a problem of cross-section dependence in the series (see Table A2 and Table A3 in the Appendix).[5] The results justified the use of the panel equilibrium error correction modeling technique. In addition, the Hausman test for random/fixed-effects models' specifications was carried out and this justified the use of the fixed-effects model in all the three models.

Having passed all pre-estimation tests, the model given as Eq. (2), a panel cointegration approach is applied to estimate the empirical model. The results from the estimation of this FDI model are given in Table 4. One of the major weaknesses of previous cross-sectional studies in estimating such models is their failure to test for cross-sectional dependence in their models in the presence of which the estimated results are problematic (see, Pesaran, 2006, 2007). We did a number of post-estimation cross-sectional dependence tests and observed no problem of cross-sectional dependence (see Table 4). In addition, a test for normality of the error terms showed that all the three models had no problem of non-normality.

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[5]The literature on panel unit-root and cointegration tests can be classified into two groups: first and second-generation unit-root and cointegration tests; where the first group developed on the assumption of cross-sectional independence while the second takes into account the presence of cross-section dependence in most panels. In this study, second-generation unit-root and cointegration tests are implemented. These tests provide more robust results even in the presence of cross-sectional dependence. Among the second-generation unit-root tests, this study uses the cross-sectionally augmented Im, Pesaran, and Shin test (CIPS) unit root test suggested by Pesaran (2007). For the cointegration test, the test developed by Westerlund (2007) which delivers robust critical values through a bootstrapping even under the assumption of cross-sectional dependence is used. Westerlund (2007) tests for cointegration using the null hypothesis of no cointegration and an alternative hypothesis that depends on the homogeneity assumption about the panel. According to the alternative hypothesis one can distinguish between group-mean tests, with G_T and G_a as the text statistics, and panel tests, with P_T and P_a as the test statistics. These four test statistics are normally distributed. The two tests (G_T, P_T) are computed with the standard errors estimated in a standard way, while the other statistics (G_a, P_A) are based on Newey and West (1994) standard errors, adjusted for heteroscedasticity and autocorrelations.

Table 4: Results of the FDI Model[6]

Dependent Variable: Δ (Log of FDI)
Method: Fixed Effects Panel Error Correction Model
Sample: 1996-2012

Variables	Estimated Model		
	Investment Driven (N, T)=(10, 17)	**Factor Driven** (N, T)=(20, 17)	**Fragile** (N, T)=(12,17)
Short Run effects			
Constant	-10.62	8.76	58.62
Δ(Log of Real GDP per capita)	0.97***	-2.02	0.32
Δ (Log of Natural Resource Abundance)	0.53**	0.12***	1.08*
Δ (Log of Domestic Investment to GDP Ratio)	1.39**	0.53	-0.37
Δ (Inflation)	-0.373**	0.06	0.02
Δ (Log of External Debt to GDP Ratio)	0.00	-0.15	-1.00
Δ (Log of Openness)	1.13	0.45	1.42
Δ (Log of Real Exchange Rate)	0.97**	-0.41	0.71
Error Correction Term	-0.98***	-0.70***	-0.88***
Long-run effects			
Log of Real GDP per capita (-1)	0.34**	0.54	0.32
Log of Log of Natural Resource Abundance (-1)	-0.01	0.17***	0.66**
Log of Domestic Investment to GDP Ratio (-1)	0.39	0.43	1.47***
Inflation (-1)	-0.51	0.00	-0.15
Log of External Debt to GDP Ratio (-1)	-0.62***	-0.17	-2.08***
Log of Openness (-1)	5.13***	-0.06	1.72
Log of Real Exchange Rate (-1)	0.89	-0.03	0.12
Political Stability	1.28**	0.51***	1.26
Government Effectiveness	2.02*	0.53*	2.82**
Diagnostic Tests			
Adjusted R-squared	0.83	0.55	0.58
F-statistic	13.22	5.73	3.97
Prob(F-statistic)	0.00	0.00	0.00
Jarque - Berra	0.14	0.98	2.86
Prob(Jarque - Berra)	0.93	0.61	0.24
Post-estimation Cross-section Dependence Tests :(Null hypothesis: Cross-sectional independence)			
Breusch-Pagan Chi-square P-Value	0.32	1.00	1.00
Pearson LM Normal P-Value	0.69	0.17	0.84
Pearson CD Normal P-Value	0.45	0.59	0.50
Friedman Chi-square P-Value	1.00	0.59	0.89

Note: ***, ** and * indicate 1, 5, and 10 per cent level of significance respectively, and N and T are respectively the number of cross-sections and years in the model.

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[6] EViews 7.1 is used for the eastimation of the model. Cross-sectional dependence test add-on EViews' module is used to generate the post-eastimation cross-sectional dependence test results in Table 4.

Table 4 shows that for investment driven African economies real GDP per capita, natural resource abundance, the level of domestic investments and exchange rate had a positive impact in the short run while inflation had a negative effect. The adjustment coefficient shows that a 98 per cent deviation from the long run equilibrium path will be adjusted in one period. This shows very fast adjustments in investment-driven countries. However, this adjustment towards equilibrium becomes slower in fragile and factor-driven economies. In the long run, real GDP per capita and openness had a significant positive impact, while external debt had a negative effect on FDI flows to the continent. In addition, political stability and government effectiveness indices had a statistically significant positive relationship with increased FDI inflows to all economies.

Table 4 further shows that in both the factor-driven and fragile economies, abundance of natural resources had a statistically significant positive impact on FDI inflows both in the short and long run. Its effect is also found to be more important in fragile rather than in factor-driven economies. It is also interesting to see that government effectiveness was important in all the three categories while political stability was important in investment-driven and factor-driven economies only.

Macroeconomic stability (whose proxies are inflation and exchange rate indicators) in the short run and openness in the long run were important only in investment-driven economies. Similarly, market size was important only in investment-driven economies perhaps indicating that FDI to these economies is market-seeking while it is resource seeking in the factor-driven and fragile economies. Finally, financial risks as measured by the stock of external debt to GDP ratio affect FDI inflows negatively in investment-driven and fragile economies only with the effect being stronger in fragile economies. This suggests that if a country is rich in resources (that is, it is factor-driven), financial risks may not be an issue.

In summary, the empirical analysis shows a number of interesting findings. One of these findings, which previous studies without country classification scheme could not be in a position to identify, is that among all determinants of FDI only government effectiveness in the long run and natural resource abundance in the short run are the factors that are found to be statistically significant in all countries. The second finding is that adjustment towards equilibrium is the fastest in investment-driven (ID) country group followed by the fragile (FR) and factor-driven (FD) country groups. Table 4 also shows that natural resource endowment is not important in ID countries while it is found to be very important in FR economies. Openness is important not for all countries, as the current literature suggests, but only in investment-driven countries. Similarly, debt is not important for FD countries may be because these countries are rich and investors may not worry about their repayment capacity. Political stability is not important for fragile country groups, which are political in bad shape anyway, while government effectiveness

is. However, political stability is found to be important for investment and factor driven country groups which are relatively developed country groupings in the continent.

7. Conclusion

Based on a new analytical classification of African economies as fragile, factor and investment driven economies we identified the main determinants of FDI inflows to Africa. The empirical analysis was conducted using a panel co-integration approach for the period 1996 to 2012. Our empirical analysis supports the hypothesis that FDI flows to Africa are conditional on the nature of the country in question as outlined in our analytical country classification.

Among all FDI determinants only government effectiveness in the long run and natural resource abundance in the short run were important determinants of FDI to all countries in Africa. The second finding of the study is that adjustment towards equilibrium was the fastest in investment-driven (ID) country groups followed by fragile (FR) and factor-driven (FD) country groups. Third, our study also showed that natural resource endowments were not important in investment-driven countries while they were very important in fragile economies. Fourth, openness was not important for all countries as current literature suggests; it was found to be important only in investment-driven countries. Similarly, financial and fund transfer risks as can be seen read from the debt to GDP ratio were not important for factor-driven economies. Political instability was not important for fragile country groups while government effectiveness was. However, political instability was important for investment and factor driven country groups.

The findings of our study suggest the importance of emphasizing different policies in different countries/country groups as well as the need for designing different FDI related incentive systems in different country groupings. Moreover, our analysis also suggests that the new analytical classification that we have developed could be an important guide in the operational and analytical work of continental organizations such as AfDB, the Economic Commission for Africa and the African Union as it suggests using different intervention strategies or policies for different countries.

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Appendix

Table A1: Final Analytical Country Classification for the Model

Fragile State African Economies (AfDB CPIA <3)	Investment-Driven African Economies (Emerging or Frontier African Economies)	Factor-Driven African Economies (Aspiring African Economies)	Comment
Burundi**	*North Africa*	(Rest of Africa)	• No African economy has reached the innovation driven stage (advanced African) , yet (except to some degree South Africa followed by Egypt and Algeria)
Central African Republic	Algeria	Angola**	
Chad	Egypt	Benin	
Comoros	Tunisia	Burkina Faso	
Congo, Dem Rep	Morocco	Cameroon	
Congo, Rep	*Other Africa*	Equatorial Guinea	
Cote d'Ivoire,	Botswana	Ethiopia	
Djibouti**	Kenya	Gabon	
Eritrea**	Mauritius	Gambia	
Guinea	Malawi	Ghana	
Guinea-Bissau	Namibia	Lesotho	
Liberia	South Africa	Libya**	
Sao Tome and Principe**	Cape Verde**	Madagascar**	
Sierra Leone		Mali	
Somalia**		Mauritania	
Sudan		Mozambique	
Togo		Niger	
Zimbabwe**		Nigeria	
		Rwanda,	
		Senegal	
		Seychelles	
		Swaziland**	
		Tanzania	
		Uganda	
		Zambia	

Note: Countries indicated by '**' are excluded from the cross-sectional dependence test, panal unit-root test, panel cointegration test, and the eastimation of the empirical model in the respective country classification due to lack of complete data.

Table A2: Second-generation Panel Unit Root Tests: CIPS

Variable	Investment-driven		Factor-driven		Fragile	
	Level	First Difference	level	First Difference	level	First Difference
Log of FDI	-1.09	-4.36	-0.15	-3.91	-1.01	-4.019
	(0.15)	(0.00)	(0.36)	(0.00)	(0.17)	(0.00)
Log of Real GDP per capita	0.67	-2.99	-0.89	-5.02	-0.93	-4.119
	(0.72)	(0.00)	(0.19)	(0.00)	(0.18)	(0.00)
Log of Natural Resource Abundance	1.58	-3.05	0.04	-4.896	-0.89	-4.94
	(0.93)	(0.00)	(0.52)	(0.00)	(0.19)	(0.00)
Log of Domestic Investment to GDP Ratio	-1.06	-4.11	0.66	-3.98	-0.93	-3.49
	(0.14)	(0.00)	(0.75)	(0.00)	(0.18)	(0.00)
Inflation	-0.97	-3.74	1.11	-3.91	0.09	-5.02
	(0.16)	(0.00)	(0.12)	(0.00)	(0.16)	(0.00)
Log of External Debt to GDP Ratio	0.04	-4.97	-0.66	-4.15	0.03	-4.99
	(0.52)	(0.00)	(0.33)	(0.00)	(0.59)	(0.00)
Log of Openness	2.64	-2.99	-0.66	-3.97	-0.93	-3.98
	(0.93)	(0.00)	(0.33)	(0.00)	(0.18)	(0.00)
Log of Real Exchange Rate	-0.97	-5.00	-0.93	-4.01	-1.06	-3.05
	(0.16)	(0.00)	(0.18)	(0.00)	(0.14)	(0.00)
Political Stability	-1.06	-4.07	0.09	-4.19	0.66	-4.23
	(0.14)	(0.00)	(0.16)	(0.00)	(0.75)	(0.00)
Government Effectiveness	0.03	-4.106	1.58	-3.29	-0.10	-4.47
	(0.59)	(0.00)	(0.93)	(0.00)	(0.46)	(0.00)

Note: CIPS test assumes cross-sectional dependence is in form of a single unobserved common factor. The null hypothesis under CIPS test is there is unit root. *P*-values are shown in parenthesis. A prefix *ln* indicates the natural log transformation of that variable.

Table A3: Westerlund (2007) Cointegration Test

Statistic	Investment-driven		Factor-driven		Fragile	
	P-value	Robust P-value	P-value	Robust P-value	P-value	Robust P-value
Gt	0.121	0.101	0.109	0.231	0.653	0.592
Ga	0.421	0.022	0.549	0.014	0.490	0.026
Pt	0.018	0.011	0.010	0.000	0.040	0.021
Pa	0.042	0.022	0.030	0.003	0.021	0.033

Note: The Westerlund (2007) cointegration test tests the null hypothesis of no cointegration. The potentially cointegrating vector in all of the three groups contains log FDI and the following variables: log of real GDP per capita, log of natural resource abundance, log of domestic investment to GDP Ratio, inflation, log of external debt to GDP ratio, log of openness ratio, log of real exchange rate, political stability and government effectiveness. Overall, the existence of cointegration for each of the country groupings is inferred, as the null hypothesis of no cointegration is typically rejected. The results in Table A3 are from the Westerlund's cointegration test equation that includes intercept and trend as a deterministic component.

Paper 3: Macroeconomic, Political and Institutional Determinants of FDI Inflows to Ethiopia

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Macroeconomic, Political and Institutional Determinants of FDI Inflows to Ethiopia

Addis Yimer

Abstract

Based along the lines of the eclectic theoretical framework of FDI flows, the short-run and long-run macroeconomic, political and institutional determinants of FDI inflows to Ethiopia for the period 1970-2014 are identified. Using an ARDL modeling approach, political and institutional factors are found to be crucial in the FDI inflows to the country. On the macroeconomic side, larger market size and market-size growth, greater availability of low-cost labor, better infrastructure development, and more openness to trade are found to affect FDI inflows positively. On the other hand, macroeconomic instability affects FDI inflows negatively. It can be argued that, despite the presence of favorable economic factors, FDI inflows into the country may be hampered if the political and institutional condition in the country is poor. Political instability and inefficiency and weakness in the bureaucracy and legal system affect FDI inflows to the country adversely.

Keywords: ARDL, Determinants, Ethiopia, FDI, Macroeconomic Stability, Political, Institutional

JEL Classification Codes: F21, F23

Macroeconomic, Political and Institutional Determinants of FDI Inflows to Ethiopia

Addis Yimer[♣]

1. Introduction

Foreign direct investment (FDI) [1] has a number of positive contributions in the growth process of poor nations. Not only does it provide the much-needed capital for filling the saving-investment, tax revenue, and foreign exchange gaps in these countries, but it is also important for employment creation, access to international markets, transfer of technology and managerial know-how (Ajayi, 2006; UNCTAD, 2013). A number of studies have reported the positive effects of FDI inflows on economic growth in developing countries through capital formation, technology and knowledge transfer, and increased market access (see, e.g., Balasubramanyam et al., 1996; Borensztein et al., 1998; Akinlo, 2004).

The Ethiopian economy must grow at least at an annual growth rate of 11 percent for more than two decades for the country to attain the per capita income level achieved today by most sub-Saharan African (SSA) countries (UNDP, 2011). However, the country's domestic source of finance is quite limited for achieving such growth. By 2016, gross domestic capital formation as a share of GDP was around 40 percent, while gross domestic saving was just 20 percent of GDP (World Bank, 2017). One alternative for filling this savings gap is through loans and development assistance from development partners (Haile and Assefa, 2006). However, as noted by Demirhan and Masca (2008), such sources of foreign finance are found to be unstable in their nature. FDI into a country, on the other hand, is more sustainable than other forms of foreign capital flows and makes the recipient country less vulnerable to a sudden stop or reversal of such flows. Acknowledging this fact, the current government of the country has opened up several sectors of the economy to foreign investors. Towards this end, several investor-friendly policies and incentive packages, including fiscal and non-fiscal, have been provided by the government. In addition, the Ethiopian Investment Commission (EIC) has been established by the government to facilitate and promote investment activities in the country. Moreover, the government has taken a number of measures to liberalize the external sector of the economy. Despite all of its

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[1] FDI is defined as "an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (FDI enterprise or affiliate enterprise or foreign affiliate). FDI implies that the investor exerts a significant degree of influence on the management of the enterprise resident in the other economy. Such investment involves both the initial transaction between the two entities and all subsequent transactions between them and among foreign affiliates, both incorporated and unincorporated. FDI may be undertaken by individuals as well as business entities" (UNCTAD, 2013, p. 245).

efforts, FDI inflows to Ethiopia have remained very low. The country's average share of global FDI inflows is only 0.01 percent for the period 2000-2013. For the same period, its annual average share in the FDI inflows to the SSA region is only 2 percent. The central question is, therefore, why does Ethiopia not attract much FDI?

There exists a large number of cross-country studies on the the factors that determine FDI flows to developing economies. However, only a few studies have been done to examine what determines the inflows of FDI to Ethiopia. While cross-country studies can identify the factors that drive FDI across countries, they provide little information with regard to the important factors that affect the host country's ability to attract FDI inflows. Even the few studies that have been done on Ethiopia in this area generally deal only with the economic determinants of FDI inflows and ignore the role played by political and institutional factors. To the best of the author's knowledge this is among the first studies that attempt to capture the effects of a wide range of political and institutional quality indicators that could affect FDI inflows to the country. Most of the existing studies also share the problems of short time-span of data, omission of relevant macroeconomic variables, and lack of appropriate econometric techniques in modeling both the short-run and long-run dynamics simultaneously. They are not theoretically and empirically systematic and comprehensive either. This study attempts to address these gaps.

This paper has six sections. Section 2 presents the FDI regulatory framework and the trend in the FDI inflows to the country. Section 3 reviews previous theoretical and empirical research on the determinants of a host country's FDI inflows. The empirical methodology employed in this study is discussed in the fourth section. Section 5 discusses the results. Finally, Section 6 concludes the study.

2. The FDI Regulatory Framework and FDI Inflows in Ethiopia

In this section the FDI regulatory framework and the general pattern of FDI inflows to the country are discussed.

2.1 The FDI Regulatory Framework in Ethiopia

The discussion on the FDI regulatory framework of the country in this section will cover issues related to the institutional framework of FDI, the sectors allowed for foreign investors, the minimum entry capital required for investment, and the various incentive packages provided for a foreign investor.

In order to invest in Ethiopia, all investors are required to get an investment permit from the Ethiopian Investment Commission (EIC, 2013). The EIC is responsible for providing information required by foreign investors; approving and issuing of investment permits; monitoring of the implementation of approved projects; approving and issuing of work permits

to foreign workers for approved projects; and facilitating the acquisition of land by foreign investors, among other things (EIC, 2013).

According to Ethiopia's investment proclamation number 769/2012 and investment amendment proclamation number 849/2014, foreign investors can invest in all sectors of the economy except in those exclusively reserved for domestic investors and the government (FDRE, 2012b, 2014a; EIC, 2017).[2] There are several sectors in which foreign investors can invest their capital in the country. These include, various manufacturing industries; agriculture and allied activities; information technology communication (ITC) industries; production, supply and transmission of electric power activities; hotel and tourism industries; first grade construction contracting; real estate development; education and training; and health services (FDRE, 2012b, 2014a; EIC, 2017).

In the sectors allowed for foreigners, a foreign investor can establish its investment activities in the country either in the form of sole proprietorship or joint ventures with domestic entities (EIC, 2017). A foreign investor is required to allocate a minimum amount of entry capital to invest in the country. However, the required minimum amount of entry capital varies depending on whether the investment is owned fully by a foreign investor or jointly with domestic investor(s) and also by the sector of interest. All fully foreign-owned investments, except those in consultancy and publishing activities, require the foreign investor to allocate a minimum entry investment capital of US$ 200 thousand per project (see FDRE, 2012b, 2014a; EIC, 2017).[3] If the investment is undertaken in partnership with domestic investor(s), the capital required from a foreign investor would need to be at least US$ 150 thousand per project (FDRE, 2012b, 2014a; EIC, 2017). On the other hand, a foreign investor reinvesting its profit or dividends made from existing investments in the country is free of such entry capital requirements (see FDRE, 2012b, 2014a; EIC, 2017).

In order to encourage investment activities in the country, the Ethiopian government currently provides various fiscal and non-fiscal incentive packages for all investors (both domestic and foreign) (see FDRE, 2012a, 2014b).

The fiscal incentives given to encourage FDI flows into the priority areas of the government[4] include exemption of export custom duties (except on a few products) and income tax holidays ranging from 1 to 9 years depending on sector and the location of the FDI in the country. In addition, there is a one hundred percent exemption of customs duties and other taxes on imports of all investment capital goods, as well as exemption of import duties and taxes on spare parts

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[2] FDRE refers to the Federal Democratic Republic of Ethiopia.
[3] The minimum capital required for a foreign investor to engage in FDI in the country in the areas of architectural, engineering and related technical consultancy services or in publishing activities is US$ 100 thousands if the investment is fully foreign owned. The amount would be US$ 50 thousands if investment in such areas is made jointly with a domestic investor (see FDRE, 2012b, 2014a; EIC, 2017).
[4] These benefits are equally applicable for domestic investors also.

worth up to 15 percent of the value of the imported capital good. Furthermore, the investment code provides a two year profit tax exemption for foreign investors (see FDRE, 2012a, 2014b; EIC, 2017).[5]

In addition, all investors who engage in exporting business are entitled to benefit from the non-fiscal incentive packages provided by the government. Such benefits include loss carry forward arrangements and importation of machinery and equipment that are needed for their projects through suppliers' credit schemes (EIC, 2013).[6] Furthermore, all investors can retain 20 percent of their hard currency export earnings for use in their investment, and all investors who are engaged in export processing are also allowed to import raw materials for their investments in Franco Valuta arrangements (EIC, 2013). Moreover, a foreign investor is allowed to make remittances out of the country in any of the convertible currencies.[7] The investment code also provides a guarantee against expropriation for all investments in the country (EIC, 2013).

2.2 FDI Inflows to Ethiopia

Ethiopia's FDI inflows have significantly increased in the last few decades (see Figure 1). FDI inflows to the country rose from a mere US$ 3.9 million in 1970 to US$ 12 million in 1990. After the liberalization of various economic sectors to foreign investors in late 1996, FDI inflows to the country reached a level of US$ 289 million in 1997. It dropped to US$ 69 million in 1999 following the country's war with neighboring Eritrea in 1998 that continued till 2000 (UNCTAD, 2016). Similarly, a major decline occurred in 2005 following the country's disputed general election (UNCTAD, 2016) before peaking to US$ 545.3 million in 2006 (see UNCTAD, 2016). FDI inflows fell however in 2007 and 2008 reaching US$ 108.6 million by 2008. This relates to the combined effects of the global financial and economic crises and surging inflation. The latter is, in part, due to international food price volatility and lax monetary policy of the Ethiopian government (Geda, and Tafere, 2011). FDI increased steadily between 2009 and 2011 to reach at US$ 626.5 million in 2011, but dropped by more than half in 2012 to a level of US$ 278.6 million partly due to the global economic recession (UNCTAD, 2016). In 2013 FDI inflows to the country reached a level of US$ 1.3 billion. In 2015, FDI inflows registered a 1.7 percent increase from US$ 2.1 billion in 2014 to achieve a record for Ethiopia of US$ 2.2 billion (see Figure 1).

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[5] The profit tax exemption extends to 5 years for investors exporting at least 50 percent of their product and supply 75 percent of their product as input to exporters (see FDRE, 2012a, 2014b; EIC, 2017). Profit tax exemption benefits are equally applicable for domestic investors also.

[6] The Loss carry forward arrangement allows investors to carry their loss forward for losses that occurred during the income tax exemption period for half of the tax exemption period. However, such losses are not allowed to be carried forward for more than five income tax period (see FDRE, 2012a, 2014b; EIC, 2017). Both domestic and foreign investors are beneficiaries of this arrangement.

[7] Such remittances include the repatriation of capital, interest payments on foreign loans, profit, dividends, asset-sale proceeds and technology transfer payments, among others (see EIC, 2017). This benefit is applicable only to foreign investors.
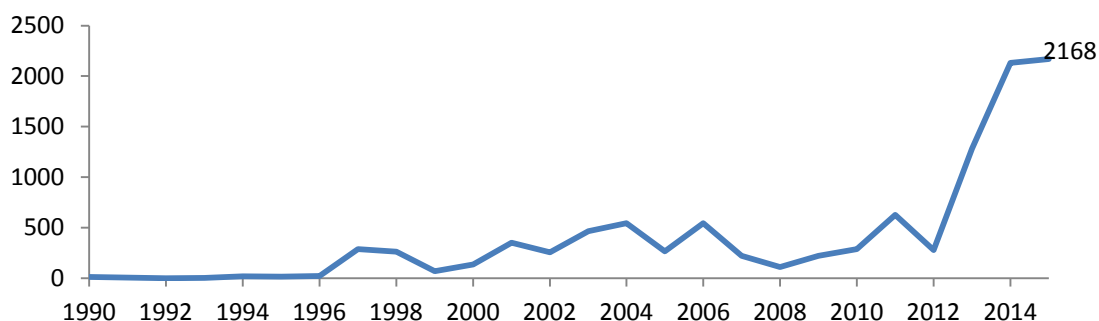
Figure 1: FDI inflows to Ethiopia (1970-2015) in Millions of US$

Source: Author's computation based on UNCTAD (2016)

Ethiopia lags behind other countries of the world in terms of the FDI inflows to the country. By 1970, Ethiopia's share was only 0.03 percent of the global FDI inflows. In the same year, Ethiopia's share in the total FDI inflows to developing countries was only 0.1 percent. Its share in the total FDI inflows to Africa and Eastern Africa region also remained at a low level of 0.3 and 5 percent, respectively. Over the years, albeit with ups and downs, Ethiopia's share in the global and developing countries FDI inflows have registered a marked increase. By 2015, Ethiopia's share in the global and developing countries FDI inflows reached 0.12 and 0.28 percent, respectively (see Table 1). The country's share in the total FDI inflows to Africa and Eastern African region has also registered a marked increase and reached 4 and 15.6 percent, respectively (see Table1). Despite the progress witnessed in the recent years, however, FDI inflows to Ethiopia still lags behind when compared to other African countries such as Angola, Egypt, Mozambique, Ghana, Morocco and Nigeria. In 2015, of the total FDI inflows of US$ 54.1 billion to Africa, Angola took about 16.1 percent followed by Egypt (12.7 percent), Mozambique (6.9 percent), Ghana (6 percent), Morocco (6 percent) and Nigeria (6 percent) (see UNCTAD, 2016). Ethiopia, with a share of 4 percent, is the 7th top FDI inflows destination country in Africa (see UNCTAD, 2016). Ethiopia's FDI stock was US$ 10.7 billion by the year 2015 – less than 2 percent of the US$ 740 billion FDI stock of Africa – making the country the 16th top FDI destination country in terms of FDI stock in Africa (see UNCTAD, 2016). In per capita FDI stock terms, Ethiopia ranks 48th in Africa with a per capita FDI stock of only US$ 106 in 2015, which is largely lower than the US$ 670 per capita FDI stock for Africa for the same year. The top FDI destination country in terms of per capita FDI stock Africa is Seychelles with a per capita FDI stock of US$ 27 thousands in 2015. Equatorial Guinea, Congo, Gabon, and Mauritius follow the ranking in their order of importance in terms of FDI stock per capita (see UNCTAD, 2017). Some of the reasons for the low performance of FDI inflows to the country over the years include land-lockedness, absence of important mineral resources like oil and petroleum, political instability particularly due to the prolonged civil-war from the mid of 1970 to early 1990s, and the lack of any investment policy till 1992, among others.

Table 1: FDI outlook in Ethiopia

	Year						
	1970	**1990**	**2000**	**2010**	**2013**	**2014**	**2015**
FDI inflows in US Dollars at current prices in millions							
Developing economies	3765.68	34657.33	232390.26	625330.31	662405.60	698493.63	764670.44
Africa	1267.09	2845.14	9650.69	43571.48	52154.20	58299.77	54079.48
Eastern Africa	80.52	389.26	1467.54	6686.24	14766.14	16786.12	13937.04
Ethiopia	3.90	12.00	134.64	288.27	1281.30	2132.00	2167.60
Share of FDI in Global FDI inflow							
Developing economies	28.41	16.91	17.10	45.03	46.41	54.70	43.39
Africa	9.56	1.39	0.71	3.14	3.65	4.57	3.07
Eastern Africa	0.61	0.19	0.11	0.48	1.03	1.31	0.79
Ethiopia	0.03	0.01	0.01	0.02	0.09	0.17	0.12
FDI inflows as percentage of GDP							
Developing economies	0.83	0.88	3.46	3.19	2.80	2.61	2.77
Africa	1.20	0.52	1.49	2.25	2.19	2.36	2.32
Eastern Africa	0.43	0.56	1.90	3.40	5.15	5.42	4.67
Ethiopia	0.15	0.10	1.68	1.10	2.75	3.97	3.82
FDI as percentage of gross capital formation							
Developing economies	3.89	3.72	13.48	9.81	7.52	7.49	8.14
Africa	5.74	2.73	10.01	13.65	14.18	12.77	12.16
Eastern Africa	2.62	3.23	10.33	18.94	21.65	17.78	14.99
Ethiopia	1.33	0.83	7.55	4.06	8.60	9.26	9.32

Source: UNCTAD (2016, 2017)

Despite the fast growth in the FDI inflows to the country, FDI in Ethiopia remains relatively weak considering the size of its economy, as can be seen from Table 1. For example, in 2015, the country's FDI inflow as percentage of GDP is only about 3.8 percent, despite increasing 19 fold from a mere 0.2 percent in 1970. Similarly, FDI inflows as percentage of gross fixed capital formation registered a marked increase over the years. It increased from a very low level of 0.2 percent in 1980 to over 10 percent in 2015 (see Table 1).

Sectorally, FDI inflows to the country in 2015 reflected the continued importance of manufacturing investments (EIC, 2016). During 1992-2015, the manufacturing sector led in attracting FDI with a share of 72 percent followed by investment in service sector (18 percent) and agriculture (10 percent) (EIC, 2016).

With regard to the regional distribution of FDI in the country, it has been unevenly distributed among the regions (EIC, 2016). Most of the FDI inflows to the country are concentrated in Addis

Ababa, largely due to the availability of better bureaucratic qualities and political stability, better developed infrastructure, and better trained labor force (EIC, 2016). Oromia regional state is another important FDI destination in the country, mainly due to its proximity to Addis Ababa, among other things (EIC, 2016).

Recently, the FDI inflows to Ethiopia have a number of changing characteristics. One of them is the growing importance of FDI inflows from emerging economies (such as China, India and Turkey). For example, China's FDI to Ethiopia has increased steadily. Chinese FDI to Ethiopia increased from just about a US$ 1 million in 2003 to US$ 122 million in 2012 (UNCTAD, 2015), representing a 365 percent average annual growth for the period 2003-2012, compared to the 7 percent growth for traditional FDI source countries (such as the United States, the Netherlands and France). When we look at the top investors by their share in the total FDI stock of the country, by 2014, Turkey stands out as the top investor (33 percent), followed by China (18 percent), Saudi Arabia (9 percent), India (9 percent), and France (3 percent) (Chen et al., 2015). Secondly, related to the above is the fact that emerging countries (especially China) are becoming significant investors and financers of mega national projects in Ethiopia. In addition to FDI, emerging economies' firms (such as those from China, India and Turkey) are also active in major investment financing activities of the Ethiopian government. Here, of all the emerging economies, the Chinese presence is of a considerable importance. For example, in 2012, though Ethiopia received only US$ 600 million of Chinese FDI stock according to UNCTAD (2016), Chinese investment financings and contracts in Ethiopia from 2005 to 2016 were about US$ 17.62 billion based on the data from The American Enterprise Institute and The Heritage Foundation (2016). We may not take such investment financings as FDI using the "standard" definition but as "Quasi-FDI" as argued by Geda (2016). Had it not been for the "Quasi-FDI" inflows, most of the mega projects of the Ethiopian government would not have been realized (Geda, 2016).

The increase in the FDI inflows to the country over the years may be explained by the factors that characterize the economic and political landscape of the period considered. The wide period under consideration has seen two distinct political regimes. The first period, 1974-1991 relates to the 'Derg' regime, [8] where the government followed command economic system in all aspects of socio-economic decision makings (Geda and Yimer, 2016). As a result the basic economic questions of what, how, and for whom to produce were centrally decided by the government. In this period, there was nationalization of land and large- and medium-scale private business organizations such as private banks, insurance companies, transport companies, and manufacturing firms (Haile and Assefa, 2006). During this period, the overall socio-economic condition in the country was not encouraging for investment activities. This is largely due to the prolonged severe civil war, nationalization policies, and deliberate repression of the private

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[8] The 'Derg' is the name for the Marxist-inspired coordinating committee of the military, which deposed Emperor Haile-Selassie in a coup in 1974.

sector by the government (Haile and Assefa, 2006; Geda, 2008; Geda and Yimer, 2016). In this period, the overall performance of the economy was also poor (see Geda, 2008).

The second period, post-1991 to present, relates to the Ethiopian People Revolutionarily Democratic Front (EPRDF) regime following the demise of the 'Derg' in 1991. The regime favored the principles of free market system and adopted market liberalization and various reform programs assisted by the World Bank and the IMF (see Geda, 2008; Geda and Yimer, 2016). In addition, the government took various investment-promoting policies and implemented a number of privatization programs. As a result, a number of publicly-owned enterprises were transferred to private citizens. The country's political stability during this period has improved substantially. The performance of the economy during this period has also improved significantly (see Geda, 2008; Geda and Yimer, 2016). Likewise, the inflow of FDI to the country has also registered a significant increase. It increased from an annual average of US$ 5.9 million during the 'Derg' era to around US$ 270 in the EPRDF regime (see UNCTAD, 2016). The significant improvement in economic performance during the EPRDF regime is due to the various liberalization policies, the wide institutional reforms and the stable political environment that has characterized the period (EIC, 2016).

3. Review of Literature

In this section, a discussion on the theoretical approaches to the determinants of FDI and its empirical regularity in Africa is presented.

3.1 Theoretical Approaches to FDI Determination

A variety of theoretical models have been developed to explain FDI flows to a host country. Broadly, we can identify the various determinants of FDI based on the different theoretical approaches as follows: [9] **(1)** determinants based on neoclassical theories of capital movement and trade within the Heckscher-Ohlin model (as presented in Ohlin, 1933),[10] and the MacDougall-Kemp model (MacDougall, 1960; Kemp, 1964), according to which FDI is motivated by higher profitability/investment returns in foreign markets under perfect market assumption; **(2)** determinants based on imperfect markets theory, including imperfect competition models and market-power theories of monopolistic advantage (see, e.g., Hymer, 1960; Kindleberger, 1969; Caves, 1971), rivalry competition in oligopolistic markets (see, e.g., Knickerbocker, 1973), internalization theory (see, e.g., Buckley and Casson, 1976; Teece, 1985; Hennart, 1991),

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[9] The classification of the theoretical approaches in this study is made based on common characteristics of the various FDI theories. Such an approach is also followed in Faeth (2009); Assunção et al. (2011). It is neither complete nor the only approach for classification. See Agarwal (1980), Faeth (2009) and Assunção et al. (2011) for a broader and detailed discussion on the theoretical models and empirical studies on the determinants of FDI.

[10] Although Ohlin wrote and published the book which first explained the theory in 1933, Heckscher was credited as co-author of the model. This is due to his earlier work on the topic and the fact that many of the ideas in the final model came from Ohlin's PhD dissertation, which was supervised by Heckscher.

microeconomic analysis of Vernon's (1966) 'product life-cycle hypothesis', and Dunning's (1977, 1979, 1993) 'eclectic' framework; **(3)** determinants of FDI according to the 'new theory of trade', which combines Dunning's (1993) OLI (ownership, location, internalization) framework with technological innovations and host country's characteristics to explain FDI (see, e.g., Dixit and Grossman, 1982; Krugman, 1983; Helpman, 1985; Markusen, 1984; Zhang and Markusen, 1999); and **(4)** determinants based on political and institutional approaches to FDI, where the influence of political and institutional variables on FDI is noted (see, e.g., Bond and Samuelson, 1986; Bénassy-Quéré et al., 2007; Cleeve, 2008; Francis et al., 2009). The empirical approach in this study is based on a combination of the eclectic framework and the political and institutional approaches to FDI determination.

In the neoclassical trade theory of the Heckscher–Ohlin model, FDI was considered as part of international capital flow in perfectly competitive goods and factor markets. According to the Heckscher–Ohlin model, international factor-price differentials, due to relative factor endowment differences between countries, would encourage capital flows between countries (Ohlin, 1933). As a result, capital would flow from a relatively capital-rich country to others where capital is relatively scarce and returns on capital are higher. This flow of capital will continue until factor price equalization is achieved (Ohlin, 1933 cited in Faeth, 2009; Assunção et al., 2011). Similarly, assuming perfect goods and factor markets, the MacDougall–Kemp model claimed that capital would move between countries in pursuit of higher investment earnings differential. As a result, it would move from relatively capital-rich countries to relatively capital-scarce countries where profits on investments are higher. However, these theories were criticized based on their assumption of perfect factor and goods markets in their models.

Hymer (1960, published in 1976) and Kindleberger (1969) argued that the assumption of perfect competition in the neoclassical theory could not explain FDI. According to them, FDI needed some form of market imperfections to exist (see also Faeth, 2009; Assunção et al., 2011). Hymer (1960) and Kindleberger (1969) outlined firm specific advantages to explain multinational corporations' (MNCs) decision to engage in FDI, based on the theory of industrial organization in monopolistic competition set up (see also Faeth, 2009; Assunção et al., 2011). Hymer (1960) and Kindleberger (1969) argued that MNCs face disadvantages when they compete with host country firms abroad. Thus, to engage in FDI and be profitable, MNCs must have firm specific ownership advantages that emanates from product differentiation, managerial know-how, economies of scale, government regulations and incentives, and patents (Hymer, 1960; Kindleberger, 1969). Similarly, Caves (1971) claimed that ownership advantages that arise from product differentiation in imperfect product and factor markets as the main reason for MNCs to engage in FDI activities. On the other hand, Knickerbocker (1973), whose theory was termed as the 'theory of oligopolistic reaction' (Faeth, 2009), argued that MNCs engage in FDI as a result of a 'follow-the-leader' strategy (Faeth, 2009) or as a reaction to the entry of competitors in a given markets (Knickerbocker, 1973; Assunção et al., 2011).

Based on the theories of investment and international trade, Vernon's (1966) 'product-life-cycle hypotheses' attempted to explain FDI using microeconomic analysis in oligopolistic markets. Vernon (1966) argued that products have a life cycle divided into three stages: growth, maturity and standardization. According to Vernon (1966), in the 'growth' stage of a product's life cycle, firms invest in more advanced economies where better absorptive capacity is available; while in the 'maturity' and 'standardization' stages, production is shifted to less-developed nations to minimize costs as products become standardized and domestic markets saturates. Thus, FDI occur as firms move their production to less developed markets to minimize their cost of production (Vernon, 1966).

In the context internalization theory, Rugman (1975) explained FDI in terms of the need to internalize transaction costs in order to increase firm's investment profitability. Internalization theory dates back to Coase (1937) and his theory of the firm (Faeth, 2009). Based on Coase's (1937) internalization concept in the theory of the firm, Buckley and Casson (1976) applied it to MNCs (Ietto-Gillies, 2005; Faeth, 2009). Coase (1937 cited in Faeth, 2009) compared the efficiency of various forms of transactions between firms. Since the market approach was often inefficient owing to market failure, he argued, firms were better off internalizing transactions (Ietto-Gillies, 2005; Faeth, 2009). Thus, Buckley and Casson (1976) claimed that MNCs prefer internalization of their operations through FDI when market related risk and uncertainty lead to higher transaction costs.

The eclectic paradigm of Dunning (1977, 1979, 1980, and 1993) provides a framework based on OLI advantages to analyze why, and where MNCs would invest abroad. Such investments could be: resource seeking (natural, physical or human resources), market seeking, efficiency-seeking or strategic asset-seeking (Dunning, 1977, 1979, 1980, 1993).

For Dunning (1977), there are benefits in choosing FDI when MNCs' have OLI advantages. As noted by Geda and Yimer (2018, p. 6) "ownership advantages are firm-specific competitive advantages which an investing firm possesses over local firms in serving particular markets." These advantages include those arising from ownership of exclusive productive processes and technology, patents, marketing and managerial know-how (Dunning and Lundan, 2008; Faeth, 2009; Assunção et al., 2011). Location advantages arise when a firm benefits from its investments in a given market as a result of the host country's natural-resources endowment, availability of cheap factors of production, large market size, favorable market structure, favorable government policies (e.g., favorable tax treatments and incentives, subsidies, and investment promoting policies), lower cost of production and distribution, lower risk factors, and entry to protected markets (Dunning and Lundan, 2008; Faeth, 2009; Assunção et al., 2011). To minimize transaction costs due to market imperfections and increase their profitability, investing firms must exploit their ownership and locational advantages through 'internalization' (Dunning,

2002). Thus, according to Dunning's OLI paradigm, MNCs engage in FDI when they possess ownership and host-country-specific location advantages that can be internalized and exploited. In the absence of these advantages, exporting is the best option to serve foreign markets (see Dunning, 1977, 1979, 1980, 1981, 2002).

An alternative theoretical framework that emerged as an explanation of FDI is related to the "new trade theory'' (Faeth, 2009; Assunção et al., 2011). "New trade theory" is an addition to Dunning's eclectic paradigm and brings together OLI advantages with technological advancement and host country's specific characteristics to explain FDI (Faeth, 2009). This theory emphasized the role of market size, low cost of production (via better developed infrastructure and technology), entry barriers in certain markets, and host country's endowment of strategic factors of production as the main drivers of FDI (see, e.g., Dixit and Grossman, 1982; Krugman, 1983; Helpman, 1985; Markusen, 1984; Zhang and Markusen, 1999; Markusen, 2002).

The institutional approach to FDI determination attempts to capture the influence of government policies and institutional and political factors in MNCs' decisions to opt for a particular place (see, e.g., Bond and Samuelson, 1986; Root and Ahmed, 2000; Bénassy-Quéré et al., 2007; Cleeve, 2008). The underlying assumption in this theory is that, despite the presence of favorable economic conditions, FDI inflows into a country may be hampered if the political and institutional factors in that country are poor. These factors include, the effectiveness of the legal system (rule of law), government policies (Francis et al., 2009) that include government regulations and incentives (Faeth, 2009), the quality of the bureaucracy (Asiedu, 2006; Geda and Yimer, 2018), and the political environment (Asiedu, 2006; Bénassy-Quéré et al., 2007; Cleeve, 2008; Geda and Yimer, 2018).

In sum, there is no one single theory of FDI but a variety of theoretical models attempting to explain location determinants of FDI flows. Likewise, there exists no unanimously accepted single factor that determines FDI flows. The various theories on FDI suggest a number of determinants that could explain FDI flows. These include market-related characteristics, transport costs, resource availability, factors of production costs, risk factors, political stability and institutional quality, and various policy variables of FDI host countries.

3.2 Empirical Literature: the Empirical Regularity in Africa

There exists a large body of empirical literature on the determinants of FDI flows to developing countries. In this section, however, the empirical regularities of the factors driving FDI flows to African countries based on some of the recent African literatures are examined. The review below presents the key determinants of FDI inflows in Africa in a clustered manner (see Table A1 in the Appendix). In the empirics, all the determinants of investment decisions of MNCs tend to focus on the location dimension of Dunning's OLI paradigm (see Table A1 in the Appendix).

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In general, the empirical literature on the determinants of FDI in Africa has been based on analysis of both cross-sectional data and panel data (see, e.g., Asiedu, 2002; Akinkugbe, 2005; Yasin, 2005; Asiedu, 2006; Mhlanga et al., 2010; Anyanwu, 2012; Sichei and Kinyondo, 2012; Mupimpila and Okurut, 2012; Anyanwu and Yameogo, 2015; Geda and Yimer, 2018) as well as country case studies (see, e.g., Haile and Assefa, 2006; Khan and Bamou, 2006; Fedderke and Romm, 2006; Kinuthia and Murshed, 2015). However, mixed results have been reported as to the determinant of FDI inflows to the continent (see Table A1 in the Appendix).

Cross-country and panel data studies on Africa have generally reported a positive effect of natural resource availability, large market size and its future growth prospects, openness of the economy, better infrastructural development, and effective bureaucracy in attracting FDI inflows to the continent (see Table A1 in the Appendix). However, the impact of real exchange rate depreciation, political stability, and macroeconomic stability on FDI inflows to FDI host country(s) is mixed (see Table A1 in the Appendix). For instance, Geda and Yimer (2018) have found a positive effect of real exchange depreciation on FDI inflows to Africa. Others (see, e.g., Okafor, 2015) found no such effect for Africa. On the other hand, political stability is found to have a positive effect on FDI inflows to the continent (see, e.g., Asiedu, 2006; Geda and Yimer, 2018) while some other studies (see, e.g., Okafor, 2015) do not confirm a robust positive effect of political stability on FDI flows to Africa (see Table A1 in the Appendix for detail).

The empirical literature on the determinants of FDI in Africa is largely dominated by panel data studies. The few available country case studies in Africa, using time-series analysis, have reported a similar result to the cross-country and panel data studies reviewed in this study (see Table A1 in the Appendix). For instance, Haile and Assefa (2006) examined the determinants of FDI in Ethiopia over the period 1974-2001. They reported that economic growth, export orientation and liberalization have significant positive impacts on FDI, while macroeconomic instability (measured by inflation) and low level of physical infrastructure (measured by telephone lines per 1,000 people) have negative impacts. Similarly, Khan and Bamou (2006) found that the level of infrastructure development (increased electricity production and ratio of paved roads) as the most significant determinant of FDI in Cameroon. Market size (GDP per capita), openness, human capital development and the rate of economic growth are also important but are found to be less significant. Seetanah and Rojid (2011) also examined the determinants of FDI in Mauritius, using reduced-form demand for an inward FDI function. In their study openness, wages and the quality of labor in the host country are found to be important. Size of the market is reported to have a relatively lesser impact on FDI, which is probably related to the limited size of the population and the good export opportunities from Mauritius to other African countries especially in the SADEC/COMESA regions. Finally, Okpara (2012) investigated the determinants of FDI flows to Nigeria during 1970 – 2009 using Granger causality and an error correction model. He found that natural-resource abundance,

fiscal incentives, favorable government policy, exchange rate and infrastructural development has had a statistically significant positive effect on FDI flows to Nigeria, while political risk is reported to have a negative effect.

In sum, a possible explanation for the mixed findings may be, in part, due to differences in the sample countries studied, measurement and variables considered, the periods covered, model specification and the econometric techniques employed. However, the findings from the empirical studies reviewed above generally indicate that the list of factors affecting FDI inflows in Africa is fairly long, although not all determinants are equally important to every investor in every location at all times. The most important factors for African countries in general include market size and growth, natural-resource abundance, labor costs, country size, trade openness, exchange rate regime, return on investment, human capital, institutional quality, political and economic stability, and investment incentives.

However, previous studies on the determinants of FDI in Africa have a number of limitations. One common problem to most cross-country and panel data studies reviewed in this study is that they overlook the importance of host countries' political and institutional factors in affecting the investment-location decision of foreign investors (see, e.g., Akinkugbe, 2005; Yasin, 2005; Mhlanga et al., 2010; Sichei and Kinyondo, 2012; Mupimpila and Okurut, 2012). In addition, most of the existing panel data and cross-country studies have methodological and data-related problems. For instance, most cross-country and panel data studies suffer from the problem of composition of countries in one sample (see, e.g., Akinkugbe 2005; Okafor 2015). This might result in unaccounted-for cross-country parameter heterogeneity which may in turn render the regression results not to be robust to a selection of countries (Herzer et al., 2008).

A common problem to most of the panel data techniques studies on the determinants of FDI in Africa reviewed above is that they overlooked to model long-run relationship between the levels of the variables in their analysis (see, e.g., Asiedu, 2002, 2006; Anyanwu, 2012; Sichei and Kinyondo, 2012; Anyanwu and Yameogo, 2015). However, the exclusion of a potential cointegrating relationship can bias the results because of the resulting model misspecification (Ericsson and MacKinnon, 2002). Moreover, all of the panel data empirical studies reviewed here (with the exception of the study by Geda and Yimer (2018) assume cross-sectional error independence in their panel. If this assumption fails to hold (which is mostly the case in macro level panel data studies) and is left unaccounted for, the results might lead to misleading inferences (Chudik and Pesaran, 2015).

The existing few time-series country case studies in Africa have their own limitations too. Most of the available country case studies on the determinants of FDI in Africa used the VAR based Johansen (1988) cointegration approach to estimate their empirical FDI model (see, e.g., Fedderke and Romm, 2006; Kinuthia and Murshed, 2015; Khan and Bamou, 2006). However, this approach requires a long-time series of data for the results to be valid. Thus, in small

samples, which are common in most time-series studies in Africa, the results from the Johansen (1988) cointegration test may not always be valid. In addition, like most cross-country and panel data studies reviewed in this study, most country case studies have overlooked the role of host countries' institutional, governance and political conditions in affecting FDI inflows (see, e.g., Haile and Assefa, 2006; Khan and Bamou, 2006; Fedderke and Romm, 2006; Kinuthia and Murshed, 2015). This might result in the problems of model misspecification and omitted variable bias. They have also lacked a clear theoretical framework in forming their empirical FDI model. As a result, the variables in their empirical models seem to be incorporated in *ad hoc* manner (see, e.g., Haile and Assefa, 2006).

4. The Empirical Methodology

This study re-examines the determinants of FDI in Ethiopia using autoregressive distributed lag (ARDL) modeling approach to address the limitations noted in previous panel and country case studies discussed above. It does using 1970-2014 annual Ethiopian data from the National Bank of Ethiopia (2016), UNCTAD (2016), and the World Bank (2016a, 2016b, 2016c). In the next subsection the description of the variables used in the empirical model is presented. In Subsection 4.2, the empirical econometric model in an ARDL framework and in Section 5 a discussion on the findings of the study is presented.

4.1 Description of the Variables

In specifying the FDI model, the theoretical approach in this study builds on the location advantages of the eclectic paradigm and the political and institutional approach to FDI determinants. The eclectic approach postulates that in order for a firm to engage in FDI, ownership (O), location (L), and internalization (I) advantages should present simultaneously. As noted by Mina (2007), both ownership and internalization advantages are firm specific characteristics that are peculiar to an investing firm. On the other hand, location advantages are specific to the FDI recipient country (Mina, 2007). In the context of Ethiopia as a host country, the location advantage relates to the resources and benefits that Ethiopia provides to a foreign investing firm. This include the supply of abundant natural resources (vast fertile land for instance), large and growing market size (from a growing economy, large population size, the country's preferential market access to large markets,[11] and its proximity to the Middle East and Europe), low-cost inputs (e.g., low-cost labor and energy even by African standards, leased land

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[11] Ethiopia is a member the Common Market for Eastern and Southern Africa (COMESA). As a result, the country has a preferential market access to 19 COMESA countries with more than 400 million populations (EIC, 2016). The country also qualifies for preferential access to European Union (EU) market under the EU's Everything-But-Arms (EBA) initiative and to USA markets under the African Growth and Opportunities Act (AGOA). Furthermore, a wide range of manufactured goods from Ethiopia can enter into the markets of most developed countries, including USA and the EU, quota and duty free under the Generalized System of Preference (GSP) (EIC, 2016).

at very cheap prices, and local access to other inputs such as cotton for textiles, and hides for leather), growing infrastructural development, fiscal and non-fiscal investment incentives (see EIC, 2013), relative political stability in the region as well as the fact that Ethiopia is the political hub of the continent. These assets attract firms to produce in Ethiopia. Based on received wisdom from previous studies and economic theory and data availability, this study uses the variables described briefly below in the estimated empirical model. The dependent variable is FDI inflows as percentage of GDP. The data for this variable is taken from UNCTAD (2015).

i)   Macroeconomic Variables

Market size*: market-seeking investors will be attracted to a country with a large and fast growing local market (Al Nasser, 2010). Among the several reasons for this, for instance, are the close links of cost efficiency and economies of scale in production with market size (Vernon, 1966). FDI location decisions depend not only on recent or past earnings, but also on the potential and expected profitability of investment projects (Torrisi, 1985). Higher economic growth, other things being equal, results in a higher level of aggregate demand, leading to greater possibilities for making profits and, thus, greater incentives to FDI inflows (Zhang, 2001). Following the literature, real GDP and its growth rate are used in this study as proxies for market size and its prospects, respectively (see, e.g., Al Nasser, 2010).

Infrastructure development: lack of efficient infrastructure means not only high transaction costs for those firms that are already in business but also a barrier to new entrants (Morisset, 2000). Well-developed infrastructures help to facilitate business operations at a lower cost and enhance the profitability of investment (Morisset, 2000). Therefore countries with good infrastructures are expected to attract more FDI. In this study, gross domestic capital formation as percentage of GDP is used as a measure of infrastructure development and it is expected to have a positive effect on FDI.

Labor supply: abundant labor supply at a lower cost is one of the factors that affect the investment decision of foreign investors. A large, efficient, and educated work force is a requirement for an attractive investment (Haile and Assefa, 2006). Ethiopia's total labor size is used in this study and FDI is expected to be positively related to it.

Openness: is trade openness, measured by total trade (exports plus imports) as a percentage of GDP. The impact of openness on FDI inflows varies based on the investors' motives for engaging in FDI. The more open an economy, the better for non-market seeking investors who would like to use the destination as an export base since increased imperfections that accompany trade protection generally imply higher transaction costs associated with exporting (Markusen and Maskus, 2002). On the other hand, market-seeking investors whose motive is to serve host country's market could react to less openness with more investment. This is related to the "tariff jumping" hypothesis, which argues that foreign firms would prefer to invest in the host country if

their interest is to capture the local market in the face of host country's high tariffs on imports (Markusen and Maskus, 2002).

Indebtedness: External debt is considered as an element of financial risk that affects the inflows of FDI to a host country adversely (Braga Nonnenberg and Cordoso Mendonca, 2004). Excessive external debt may signal imminent fiscal imbalances and signal the future economic outlook in a country (Serven and Solimano, 1992). High indebtedness represents high transfer risk for foreign investors − the risk of potential restrictions on the ability to freely move money in and out of investment host country (Serven and Solimano, 1992). External debt as a percentage of GDP is used for measuring the country's indebtedness. The expected effect of greater indebtedness on FDI inflows is negative.

Macroeconomic instability: Macroeconomic instability is one of the risk factors which foreign investors take into account when deciding on where to invest. Inflation is used as an indicator of macroeconomic instability. Sound macroeconomic stability signals the strength of an economy and provides a degree of certainty of being able to operate profitably (Balasubramanyam, 2001). Thus, a stable macroeconomic condition promotes FDI by lowering perceived risks on investment returns (Buckley et al., 2007). The expected effect of greater inflation on FDI inflows is negative.

Real Exchange rate: The effect of changes in the real exchange rates on FDI flows is ambiguous. Elbadawi and Mwega (1997), for instance, argued that depreciation in the host country's real exchange rate would attract larger FDI inflows, as it will increase the relative wealth of foreign firms and lead to an increase in foreign purchases of domestic assets. In addition, it will lead to increased private capital inflows as foreign firms try to take advantage of the now relatively cheaper domestic labor. However, quite to the contrary, FDI inflows may be discouraged by depreciation of host country's exchange rate (Markusen, 2002). It may be argued that, if FDI is occurring mainly to attend to the domestic market, depreciation increases the costs of imported factors of production and affects investment's profitability negatively. In this study the real exchange rate is used to consider the effect of exchange rate movements on FDI inflows to the country**.** It is calculated as the nominal exchange rate (the price of one United States dollar in terms of Ethiopian birr) times the domestic price level divided by the foreign price level as measured by the United States' price index.

ii)   Political and Institutional Variables

Schneider and Frey (1985) argued that political instability erodes the confidence of foreign investors as it negatively affects their expectation to operate safely and profitably in politically unstable environments. Also, Aseidu (2002) argued that the quality of host country's institutions (such as political stability, rule of law, and the bureaucracy) is crucial in the location decision of MNCs, especially when they opt to invest in Africa.

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This study uses the Worldwide Governance Indicators (WGI) research dataset of the World Bank (2016c) to capture the effect of political instability and quality of institutions on the FDI inflows to the country. The WGI project constructs aggregate indicators[12] of six broad aspects of governance, as listed below (see Kaufmann et al., 2010, page 3, from which the following quotes are taken). *Voice and accountability* embodies "perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media". *Political stability* embodies "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism". *Government effectiveness* embodies "perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies". *Regulatory quality* embodies "perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development". *Rule of law* embodies "perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence". *Control of corruption* embodies "perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests".

As there is high correlation among the six political and institutional indicators noted above, and therefore a possibly high extent of multicollinearity amongst them (see Table A2 in the Appendix), this study uses an aggregate sum (after normalization) of these six variables in the empirical estimation of the model, with that sum referred to as the *aggregate political stability and institutional indicator*.[13] The expected effect on FDI inflows from having a higher value for the aggregate political stability and institutional indicator is positive, which indicates that better institutions will stimulate more inflows of FDI.

4.2 The Empirical Econometric Model in an ARDL Framework

In economic literature, a number of cointegration techniques such as the Engle-Granger (1987), Johansen (1988), Johansen and Juselius (1990), Phillips and Hansen (1990), Gregory and Hansen

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[12] The six aggregate indicators are based on 31 underlying data sources reporting the perceptions of governance of a large number of survey respondents and expert assessments worldwide. The WGI methodology paper of Kaufmann et al. (2010) provides details on the data sources for building these indicators, the method of aggregation, and how to interpret the indicators.

[13] The normalization is done using the following formula: for variable x,
$x_{normalized} = (x - x_{minimum})/(x_{maximum} - x_{minimum}) = (x - (-2.5))/(2.5 - (-2.5))$. This is done on a yearly basis for each of the six indicators, then a simple sum (assigning equal weights) of the normalized values for the six variables is taken on a yearly basis.

(1996), Saikkonen and Lütkepohl (2000) and Pesaran et al. (2001) ARDL approach are used. This study employs ARDL bounds testing approach to cointegration advanced by Pesaran et al. (2001).

The ARDL approach, developed by Pesaran et al. (1996), Pesaran and Shin (1999), and Pesaran et al. (2001), has a number of advantages over other cointegration techniques. First, it can be used irrespective of whether the variables are I(0) or I(1) or have a mix of these integration orders, as long as none of the variables in the model is integrated of order 2 or higher.[14] Traditional approaches such as those in Engle and Granger (1987), Johansen and Juselius (1990), and Phillips and Hansen (1990) require that all the series have identical orders of integration. Second, unlike other multivariate cointegration techniques such as that by Johansen and Juselius (1990), it is relatively simple and allows for the estimation of a cointegration relationship using the ordinary least square (OLS) method. Third, it is comparatively more robust and efficient in small samples consisting of 30 to 80 observations (Pesaran et al., 2001).

In addition, traditional cointegration techniques may also experience the problems of endogeneity, whereas the ARDL technique generally provides unbiased estimates of the long-run model and valid *t*-statistics even when the regressors are endogenous (Pattichis, 1999; Pesaran and Shin, 1999; Pesaran et al., 2001; Harris and Sollis, 2003; Narayan and Smyth, 2005). Furthermore, the appropriateness of utilizing an ARDL model is that the ARDL model is based on a single-equation framework. ARDL cointegration estimates short run and long run relationships simultaneously and provide unbiased and efficient estimates (Pesaran and Shin, 1999). An error correction model (ECM) can also be derived from an ARDL model through a simple linear transformation (Pesaran and Shin, 1999). As noted by Pesaran and Shin (1999), an ECM integrates short-run adjustments with long-run equilibrium without losing long-run information. These advantages of the ARDL technique over other standard cointegration techniques justify its application in this study in order to investigate the short- and long-run relationships between FDI and each of its determinants.

The estimation procedure in the ARDL framework involves two steps. First, the existence of a long-run relationship between the variables in the model is tested by considering F-statistics. If evidence of a long-run relationship is found then at the second stage the short-run and long-run parameters are estimated using the ARDL method. Following Pesaran et al. (2001), the ARDL model in this study can be written as follows:

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[14] The ARDL procedure will, however, be inefficient in the existence of I(2) or higher order series.

$$\Delta fdi_t = \alpha_0 + \beta_1 fdi_{t-1} + \beta_2 rgdp_{t-1} + \beta_3 rgdpg_{t-1} + \beta_4 \pi_{t-1} + \beta_5 debgdp_{t-1} + \beta_6 op_{t-1}$$

$$+ \beta_7 rer_{t-1} + \beta_8 lbr_{t-1} + \beta_9 infr_{t-1} + \beta_{10} polinst_{t-1} + \sum_{i=1}^{p_1} \delta_{1i} \Delta fdi_{t-i}$$

$$+ \sum_{i=0}^{p_2} \delta_{2i} \Delta rgdp_{t-i} + \sum_{i=0}^{p_3} \delta_{3i} \Delta rgdpg_{t-i} + \sum_{i=0}^{p_4} \delta_{4i} \Delta \pi_{t-i} + \sum_{i=0}^{p_5} \delta_{5i} \Delta debgdp_{t-i}$$

$$+ \sum_{i=0}^{p_6} \delta_{6i} \Delta op_{t-i} + \sum_{i=0}^{p_7} \delta_{7i} \Delta rer_{t-i} + \sum_{i=0}^{p_8} \delta_{8i} \Delta lbr_{t-i} + \sum_{j=0}^{9} \delta_{9i} \Delta infr_{t-i}$$

$$+ \sum_{i=0}^{10} \delta_{10i} \Delta polinst_{t-i} + \gamma D + \varepsilon_t \qquad (1)$$

where α_0 is the deterministic drift parameter and Δ denotes the first difference operator of the respective variables. fdi is the log of the FDI to GDP ratio, $rgdp$ is the log of real GDP, $rgdpg$ is real GDP growth, π is the inflation rate, $debgdp$ is the log of the external debt to GDP ratio, op is the log of openness, rer is the log of the real exchange rate, lbr is the log of the labor force size, $infr$ is the log of infrastructure development, and $polinst$ is the aggregate indicator of political stability and quality of institutions in the host country discussed at the end of the last subsection. D is a dummy variable for regime shift taking a value of one for the year 1991 and onwards, and zero otherwise. ε_t is an error term, assumed to be independently and identically distributed.

The selection of the optimal lag order of the ARDL is based on the Schwarz Information Criterion (SIC) since it is very suitable with small sample sizes and provides a more parsimonious specification (Pesaran and Pesaran, 2009). In order to test cointegration among the variables, Pesaran et al. (2001) suggests the F-test for joint significance of the coefficients of the lagged level of variables, where the F-statistics for testing the joint hypotheses has to be compared with the critical values as tabulated by Pesaran et al. (2001). The joint hypothesis to be tested on Eq. (1) is:

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = \beta_9 = \beta_{10} = 0 \qquad (2)$$

If this hypothesis can be rejected then the null hypothesis of no cointegration can be rejected. Pesaran et al. (2001) provided two sets of critical values - lower and upper bound critical - for a given level of significance. At this stage, the order of integration of each variable should be determined before any inference can be made. When the order of integration of all the variables is found to be I (1) then the decision is made based on the upper critical bound. On the other hand, if all the series are I (0), then the decision is made based on the lower critical bound. If the

F-statistic is higher than the upper bound critical value, the null hypothesis (H_0) of no cointegration is rejected and we conclude in favor of a long-run relationship. In contrast, if the F-statistic is under the lower critical bound, then the null hypothesis of no cointegration cannot be rejected and we conclude no long-run relationship exists. However, if the F-statistic falls in between the upper-bound and lower-bound critical values, the inference would be inconclusive. To check the robustness and reliability of the ARDL model, we apply a battery of diagnostic tests that includes tests for normality of the error term, serial correlation, heteroscedasticity, and the functional form of our empirical model.

If the null hypothesis of no cointegration is rejected, then following the procedure in Pesaran et al. (2001), the error-correction model (ECM) will be estimated in the second step. The ECM formulation of Eq. (1) is specified as follows:

$$
\begin{aligned}
\Delta fdi_t = \alpha_0 + \theta ec_{t-1} &+ \sum_{i=1}^{p_1} \delta_{1i} \Delta fdi_{t-i} + \sum_{i=0}^{p_2} \delta_{2i} \Delta rgdp_{t-i} + \sum_{i=0}^{p_3} \delta_{3i} \Delta rgdpg_{t-i} + \sum_{i=0}^{p_4} \delta_{4i} \Delta \pi_{t-i} \\
&+ \sum_{i=0}^{p_5} \delta_{5i} \Delta debgdp_{t-i} + \sum_{i=0}^{p_6} \delta_{6i} \Delta op_{t-i} + \sum_{i=0}^{p_7} \delta_{7i} \Delta rer_{t-i} + \sum_{i=0}^{p_8} \delta_{8i} \Delta lbr_{t-i} \\
&+ \sum_{j=0}^{9} \delta_{9i} \Delta infr_{t-i} + \sum_{i=0}^{10} \delta_{10i} \Delta polinst_{t-i} + \gamma D + v_t
\end{aligned}
\tag{3}
$$

where, δ_1, δ_2, ... δ_{10} are the short-run dynamic coefficients of the model's convergence to equilibrium, θ is the adjustment speed from the short-run to the long-run equilibrium among the variables, and ec_{t-1} is the error-correction term, consisting of the difference of fdi_{t-1} from an estimated linear combination of the time t-1 values for $rgdp$, $rgdpg$, π, $debgdp$, op, rer, lbr, $infr$, and $polinst$.

5. Discussion of Results

Before any estimation is carried out for the econometric analysis, a test for stationarity of the variables is undertaken and some are found to be I(1), while others are I(0) (see Table 2).[15]

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[15] Results using the Bai and Perron (1998, 2003a, 2003b) unit root test, which extends the Quandt-Andrews framework by allowing for multiple unknown breakpoints in the data, are largely in conformity with the results presented in Table 2.

Table 2: Unit-Root Test Results

Variables	In Levels		In First Differences		Conclusion
	Intercept	Intercept & trend	Intercept	Intercept & trend	
ln FDI inflows to GDP ratio	-2.01 (0.28)	-2.04 (0.55)	-5.05 (0.00)	-5.22 (0.00)	**I(1)**
ln real GDP	2.53 (0.99)	-0.20 (0.99)	-3.83 (0.00)	-4.62 (0.00)	**I(1)**
Real GDP growth	-4.26 (0.00)	-5.04 (0.00)	-7.74 (0.00)	-756 (0.00)	**I(0)**
Inflation	-3.94 (0.01)	-4.44 (0.00)	-7.51 (0.00)	-7.42 (0.00)	**I(0)**
ln external debt-to-GDP ratio	-0.91 (0.77)	-2.76 (0.22)	-3.48 (0.01)	-3.40 (0.03)	**I(1)**
ln real exchange rate	1.42 (0.99)	-1.28 (0.86)	-3.89 (0.00)	-4.64 (0.00)	**I(1)**
ln openness	-2.03 (0.27)	-4.02 (0.02)	-10.53 (0.00)	-10.70 (0.00)	**I(1)**
ln labor supply	1.81 (0.99)	-8.77 (0.00)	-4.06 (0.00)	-4.84 (0.00)	**I(1)**
ln infrastructure development	-0.08 (0.94)	-2.96 (0.16)	-7.78 (0.00)	-7.62 (0.00)	**I(1)**
Aggregate political and institutional indicator	-1.13 (0.66)	-2.70 (0.25)	-3.99 (0.00)	-6.20 (0.00)	**I(1)**

Notes: The unit-root test used is the ADF test, with SIC determining the augmentation lag. The *t*-statistics for testing for a unit root (the null hypothesis) are provided, and the associated *p*-values are shown in parentheses. The prefix *ln* indicates the natural log transformation of the given variable.

After determining the integration orders of the variables, the next step in the bounds-test approach for cointegration is to estimate the ARDL model using the appropriate lag-length. One of the most important issues in applying ARDL is choosing the order of the distributed lag functions. Since we have a small data sample, 44 annual observations, SIC is used for choosing lag lengths. Pesaran et al. (2001) showed that SIC is preferable to other model specification criteria as it is suitable with small sample sizes. Given the small sample nature of our data, the maximum lag length in the ARDL model is chosen to be one for Δfdi and to be zero for all the Δ variables in Eqs. (1) and (3) (i.e., $p_1 = 1$ and $p_2 = p_3 = \cdots p_{10} = 0$).

The results from the bounds test for cointegration, as shown in Table 3, indicate that we can reject the null hypothesis of no long run connection among the variables since the computed F-statistic for the test equation is greater than the upper-bound critical value at the one-percent significance level. This indicates the presence of long-run relationship among the variables of interest in the model.

Table 3: The Bounds Test for Cointegration

F-statistic	Upper-bound critical value, 1% significance level	
	I(0)	I(1)
4.95	2.54	3.86

Note: The F-statistic tests the null hypothesis of no cointegration. The potentially cointegrating vector in the estimated model contains the log of the ratio of FDI inflows to GDP along with the following variables: real GDP growth, inflation, log of external debt to GDP ratio, log of real exchange rate, log of openness, log of labor force, log of infrastructure development, and the aggregate political and institutional indicator.

The ECM estimates considering long-run and short-run determinants of FDI inflows to Ethiopia based on the ARDL approach are presented separately below.

A) *The Long Run Model*

Based on the empirical FDI model estimated using the ARDL modeling approach, the estimated coefficients for the variables being considered as long-run determinants of FDI inflows in Ethiopia are presented in Table 4 and discussed below.[16]

Table 4: The Long Run Model Result

Dependent Variable: Log of FDI Inflows to GDP ratio

Sample: 1970 - 2014 ; No of Observations : 44

Variables	Coefficient
Log of real GDP	2.01**
Real GDP growth	0.36**
Inflation	-0.01*
Log of external debt-to-GDP ratio	0.12
Log of real exchange rate	0.21
Log of openness	0.52**
Log of labor supply	0.43**
Log of infrastructure development	1.20**
Aggregate Political and Institutional Indicator	1.96***
Dummy for regime shift in 1991	0.94**
Constant	-87.50**

***, ** and * indicates 1 %, 5% and 10% level of significance respectively.

Market Size: The significant positive long-run coefficient of the real GDP variable is in line with theory and might suggest the importance of market-seeking FDI inflows to the country. Thus, in Ethiopia, large market size (in terms of real GDP) is associated with higher FDI inflows over the longer term. This is consistent with the findings of previous studies in Africa (see, e.g., Aseidu, 2006; Mohamed and Sidiropoulos, 2010; Geda and Yimer, 2018). In addition, along with market size, economic growth measured by real GDP growth rate is also found to be positively associated with higher FDI inflows to the country. The latter is true as FDI is, at least to a certain degree, assumed to reflect the behavior of a forward-looking investor (Al Nasser, 2010). Given that Ethiopia is one of the fastest growing economies in Africa with a growth rate averaging 7.7 percent between 2004 and 2013 (EIC, 2015), this result is in line with the hypothesis that countries that have relatively high and sustained economic growth receive more FDI inflows.

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[16] EViews 9 is used to generate all the result tables in this study.

Similar findings are reported in previous studies for other developing countries (see, e.g., Al Nasser, 2010; Jiménez, 2011).

Macroeconomic Stability: On the other hand, macroeconomic instability, measured by the annual inflation rate, is found to have a negative relationship with FDI inflows to the country. The significant negative coefficient of the inflation variable may result from foreign investors preferring to invest their money in countries where they perceive better long term macroeconomic stability. These results are consistent with those found in previous studies on Africa (see, e.g., Aseidu, 2006; Geda and Yimer, 2018). In this regard, Ethiopia has consistently maintained stable and low inflation, averaging less than 5 percent per annum for the last five decades until 2003 (Geda and Tafere, 2011). Inflation has been rising at a higher rate in Ethiopia since 2008.[17] As high inflation may reflect the government's inability to balance its budget, investors might focus their investment activities on more financially stable economies with lesser degrees of uncertainty.

Openness, Indebtedness, and Exchange rate: The long-run coefficient of the trade openness variable is found to be significantly positive, which supports the proposition that foreign investors are more likely to invest in countries that have opened up to the outside world. This result may also suggest the presence of market-seeking investments - horizontal FDI - motivated to serve conjoining markets. A similar finding is also reported in other studies on Africa (see, e.g., Onyeiwu and Shrestha, 2004; Asiedu, 2006; Anyanwu, 2012; Geda and Yimer, 2018). On the other hand, the results for the long-run effects of a country's indebtedness and deprecation in the exchange rate failed to be significant in the long-run.

Labor Supply and Infrastructure Development: Another significant result, in the long-run, is the effect of labor supply and infrastructural development. The availability of low-cost labor[18] in abundant supply in the country is found to have a significant positive association with increased FDI inflows. This tallies with the fact that the FDI inflows to the country have a predominantly low-skill labor-intensive character. In addition, better infrastructure development, as measured by domestic investment as percentage of GDP, is found to have a positive association with FDI inflows of the country. A similar result is reported in previous studies in Africa using the same variable in measuring infrastructure (see, e.g., Haile and Assefa, 2006).

Political Stability and Institutions: The aggregate political and institutional indicator (*Polinst*) is found to be a significantly positive determinant of long term FDI inflows to the country. This result supports the hypothesis that inflows of FDI into a country can be disrupted by political instability and poor quality institutions in a country. One can argue that poor quality institutions

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[17] Geda and Tafere (2011) reported that, among other things, lax fiscal and monetary policies of the government are the causes of the recent high inflationary experience in Ethiopia.
[18] Ethiopia offers a cheap labor even by African standards (see EIC, 2016).

raises the costs of doing business, thereby deterring inflows of FDI. A similar effect of political stability and political institutions, using disaggregated institutional indicators, is reported in Tanzi and Davoodi (2000) for transition economies and in Geda and Yimer (2018) for Africa.

In sum, the long-run determinants of FDI inflows in Ethiopia are found to be market-related characteristics, abundant supply of labor, macroeconomic stability, openness of the economy, infrastructural development, political stability and good-quality institutions. The long-run results support there being a regime shift in 1991 that has led to greater FDI inflows in that year and after, which is arguably due to a more liberalized economy and business-friendly environment.

B) *The Short Run Model*

The results of the estimated ARDL short-run error-correction model are presented in Table 5. In the short run, the significant determinants of FDI inflows to the country are economic factors such as market size and its future prospects as measured by real GDP and its growth, openness, availability of low-cost abundant labor supply, and infrastructure development. In addition, political stability and good institutions such as better performance of the rule of law and effective bureaucracy are found to affect FDI inflows in a significantly positive way.

Table 5: The Short Run Model: Error Correction Model (ECM) Result

Dependent Variable: Δ(Log of FDI Inflows to GDP ratio)

Sample: 1970 - 2014; No of Observations : 44

Variables	Coefficient
Δ(Log of FDI to GDP ratio)-one period lag	0.23
Δ(Log of real GDP)	1.42**
Δ (Real GDP growth)	0.68*
Δ (Inflation)	0.01
Δ (Log of external debt-to-GDP ratio)	-0.19
Δ (Log of real exchange rate)	0.67
Δ (Log of openness)	0.43**
Δ (Log of labor supply)	0.34***
Δ (Log of infrastructure development)	1.01*
Δ(Aggregate political and institutional indicator)	0.58**
Dummy for regime shift in 1991	2.43**
Error-correction term	-0.80***

***, ** and * indicates 1 %, 5% and 10% level of significance respectively

The importance of political stability in the short run can be seen from Figure 1 in section 2. FDI inflows to the country were hard hit by the political upheavals in 1998 and 1999 due to the war with Eritrea over border conflict. For instance, in 1998 and 1999 the intensified war impeded

FDI inflows to some regions of the country neighboring Eritrea like Tigray (EIC, 2016). No foreign investor was registered to invest in Tigray during these periods. Similarly, FDI inflows to the country were significantly reduced in 2005 following the political crises due to the disputed general election in the country. A similar result of political instability is reported in previous studies in Africa (see, e.g., Aseidu, 2006; Geda and Yimer, 2018).

The significantly positive coefficient of the trade openness variable suggests that liberalization policies of the external sector of the country may have indeed encouraged FDI inflows and supports the proposition that foreign investors are more likely to invest in countries that have opened-up to the rest of the world (see, e.g., Onyeiwu and Shrestha, 2004; Asiedu 2006; Anyanwu 2012; Geda and Yimer, 2018).

As Table 5 further shows, the estimated coefficient for the error-correction term is highly significant with a value of -0.80. This suggests that deviation from the long-term trajectory is corrected rather quickly in the model. As noted by Banerjee et al. (1998), a highly significant negative coefficient for the error-correction term is a further proof of the existence of a stable long-term relationship between the variables of the model.

In sum, market size and its growth prospects, availability of abundant labor supply, openness of the economy, better infrastructural development, and political stability and good quality institutions are found to be robust determinants of FDI both in the short run and long run. While macroeconomic instability, measured by inflation, is one of the robust determinants of long-run FDI inflows to the country, its effect in the short-run is insignificant.

C) *Model Diagnostic and Tests*

A battery of model diagnostic tests was applied to check the robustness of the estimated model (see Table 6). The tests indicate that the estimated model has the desired statistical properties. The model has a good fit. The high value of the adjusted R-square suggests that a significant part of the variation in the FDI inflows to the country is jointly explained by the explanatory variables included in the model. The Jarque–Bera (1987) statistic confirms the normality of the residuals, as the null of "errors are normally distributed" is not rejected. From the results of the Breusch–Godfrey Lagrange Multiplier (LM) test and Engle's (1982) Autoregressive Conditional Heteroskedasticity (ARCH) test, we fail to reject the null-hypotheses of no serial correlation and no conditional heteroscedasticity of the residuals. Thus, there is no apparent problem of serial correlation and heteroskedasticity in the estimated model. The Ramsey (1969) Regression Equation Specification Error Test (RESET) supports the correct functional form was used for the estimated model.

Table 6: Model Diagnostic and Tests

Tests	Value
R-squared	0.91
Adjusted R-squared	0.86
F-statistic	13.01
Prob(F-statistic)	0.00
Jarque - Berra	0.54
Prob(Jarque - Berra)[a]	0.62
Breusch-Godfrey Serial Correlation LM Test, p-value[b]	0.31
Heteroskedasticity Test: ARCH, p-value[c]	0.28
Ramsey RESET Test, p-value[d]	0.27

[a] Null hypothesis is normality in the error-term distribution. [b] Null hypothesis is no serial correlation. [c] Null hypothesis is no conditional heteroscedasticity. [d] Null hypothesis is no model misspecification.

The presence of parameter stability is one of the econometric requirements for a well-specified and performing ARDL model (Murthy and Okunade, 2016). The stability of the regression coefficients is evaluated by stability tests that can show whether or not the regression equation is stable over time (Pesaran and Pesaran, 2009). In order to test for the stability of the short-run and long-run coefficients estimated by the ARDL model, the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests on the recursive residuals from the estimated ARDL model were performed. These CUSUM and CUSUMSQ stability tests should be undertaken in time series data, especially when there is uncertainty regarding when structural change might have taken place (Pesaran and Pesaran, 2009). Figure 2 presents the results of these tests. The plots of CUSUM and CUSUMSQ statistics both lie between the critical bounds at 5 percent significance level and did not cross the lower and upper critical limits in the estimated model (Figure 2). This indicates that the estimated coefficients have the desired characteristics of parameter stability over the sample period in the estimated model.
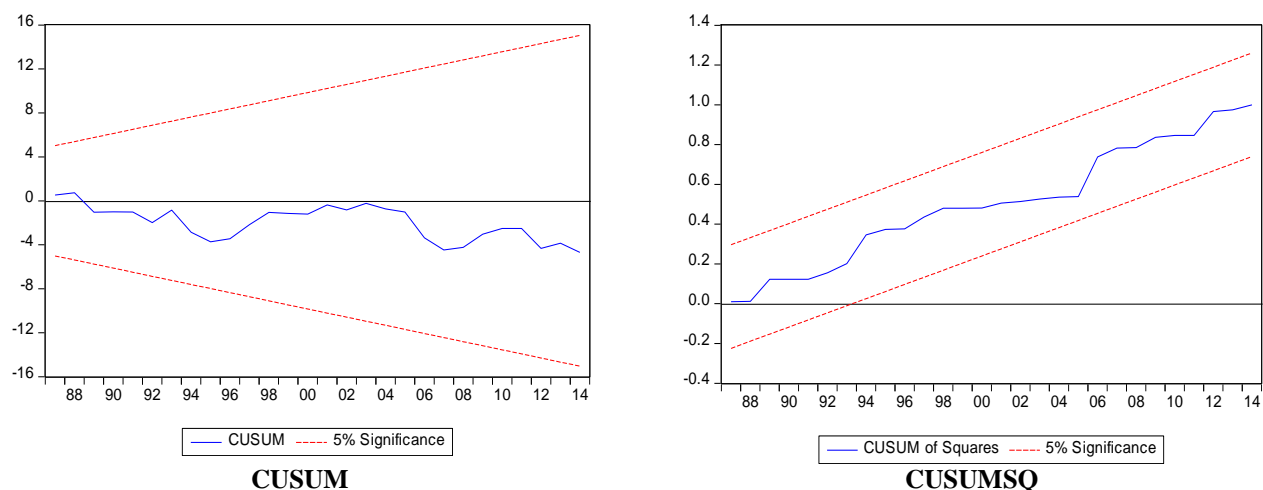
Figure 2: Parameter stability tests

6. Conclusion

Based on an ARDL modeling approach and Dunning's (1981, 1988) "*eclectic*" theoretical framework, this study has investigated the economic, political, and institutional determinants of FDI inflows to Ethiopia for the period 1970-2014. The results found in this study emphasize the need to have sound macro policy and an enabling business environment manifested through better political stability and institutional quality for the country to attract more FDI. Larger market size and improved market-size prospects, greater openness, increased supply of labor, better infrastructural development, stable political ground, and better-quality institutions affect the inflows of FDI positively. The effect of macroeconomic instability on FDI is found to be negative.

Despite the presence of favorable economic factors, FDI may not flow into Ethiopia if the political and institutional qualities in the country are poor. An unstable political environment makes investment risky and erodes the confidence of investors. In addition, an inefficient government bureaucracy and legal system may open loopholes for corrupt activities and may also hinder the enforcement of laws and contracts which in turn affects the inflows of FDI negatively.

Prudent fiscal and monetary policies to tackle the negative impact of inflationary pressures on FDI inflows and a move towards a careful liberalization of the external sector are important areas to work on in order to boost the inflows of FDI to Ethiopia. Policies that are conducive to sustaining the recent growth momentum of the Ethiopian economy and its macroeconomic stability are essential elements of an enabling investment environment. They are as important to foreign investors as they are to domestic ones, as they determine risks and profitability of investment. Efforts to strengthen the political stability of the country are fundamental areas that

policy-makers could work on to improve the country's position in the FDI inflows of the continent. Corruption should be tackled through good quality institutions that promote increased transparency and accountability.

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Appendix

Table A1: Selected Recent Empirical Literature on Determinants of FDI Determinants in Africa

Determinant	Country	Econometric Technique	Variable(s) Used	Impact on FDI inflows	Author(s)
	Cross-country and Panel Studies				
	45 African Countries	Panel data (1995-2012)	Real GDP per capita	+	Geda and Yimer (2018)
	23 SSA countries	Panel data (1996–2010)	Real GDP per capita	+	Okafor (2015)
	45 African countries	Panel data	Real GDP growth	+	Sichei and Kinyondo (2012)
	14 SADC	Panel data	GDP	+	Mhlanga et al. (2010)
	22 SSA countries	Panel data (1984–2000)	GDP	+	Asiedu (2006)
Market Size	11 SSA	Panel data (1990–2003),	Real GDP per capita growth	0	Yasin (2005)
	53 African countries	Panel data (1970–2000)	Real GDP per capita	+	Akinkugbe (2005)
	34 SSA countries	Panel data (1980-2000)	Real GDP per capita Real GDP growth	+ +	Asiedu (2002)
	Country Case Studies				
	Kenya	Time series(VECM) (1960–2009)	Real GNP	+	Kinuthia and Murshed (2015)
	Cameroon	Time series(VECM)	GDP per capita Real GDP growth	+ +	Khan and Bamou (2006)
	South Africa,	Time series(VECM) (1956–2003)	Real GDP	+	Fedderke and Romm (2006)
	Ethiopia	Time series Analysis (1974-2001)	Real GDP growth	+	Haile and Assefa (2006)
	Cross-country and Panel Studies				
	45 African Countries	Panel data (1995-2012)	(X+M)/GDP	+	Geda and Yimer (2018)
	West Africa	Panel data	(X+M)/GDP	+	Anyanwu and Yameogo (2015)
	22 SSA countries	Panel data (1984–2000)	(X+M)/GDP	+	Asiedu (2006)
	11 SSA	Panel data (1990–2003),	(X+M)/GDP	+	Yasin (2005)
Openness of the Economy	53 African countries	Panel data (1970–2000)	(X+M)/GDP	+	Akinkugbe (2005)
	34 SSA countries	Panel data (1980-2000)	(X+M)/GDP	+	Asiedu (2002)
	Country Case Studies				
	Kenya	Time series(VECM) (1960–2009)	Average of annual export and import duty	-	Kinuthia and Murshed (2015)
	South Africa,	Time series(VECM) (1956–2003)	(X+M)/GDP	+	Fedderke and Romm (2006)

	Cameroon	Time series(VECM)	(X+M)/GDP	+	Khan and Bamou (2006)
	Ethiopia	Time series Analysis (1974-2001)	Export	+	Haile and Assefa (2006)
	Cross-country and Panel Studies				
Natural Resources Endowment	45 African Countries	Panel data (1995-2012)	Natural resource rent to GDP ratio	+	Geda and Yimer (2018)
	West Africa	Panel data (1970-2010)	Oil and metals exports to GDP ratio	+	Anyanwu and Yameogo (2015)
	23 SSA countries	Panel data (1996–2010)	Crude oil and natural gas exports to GDP ratio	+	Okafor (2015)
	45 African countries	Panel data	Natural resource rent to GDP ratio	+	Sichei and Kinyondo (2012)
	African countries	Panel data (1996–2008)	Oil and metals exports to GDP ratio	+	Anyanwu (2012)
	22 SSA countries	Panel data (1984–2000)	Export of fuels and minerals to total export ratio	+	Asiedu (2006)
	Country Case Studies				
	Nigeria	Time series(VECM) (1970 – 2009)	Oil and metals exports to GDP ratio	+	Okpara (2012)
	Cross-country and Panel Studies				
Economic Instability	45 African Countries	Panel data (1995-2012)	Inflation	-	Geda and Yimer (2018)
	23 SSA countries	Panel data (1996–2010)	Inflation	-	Okafor (2015)
	SADC	Panel data (1990–2007)	Inflation/ lagged value of inflation	+/-	Mupimpila and Okurut (2012)
	22 SSA countries	Panel data (1984–2000)	Inflation rate	-	Asiedu (2006)
	Country Case Studies				
	Kenya	Time series(VECM) (1960–2009)	Inflation	-	Kinuthia and Murshed (2015)
	Ethiopia	Time series Analysis (1974-2001)	Inflation	-	Haile and Assefa (2006)
	Cross-country and Panel Studies				
Indebtedness/Higher Transfer Risks	45 African Countries	Panel data (1995-2012)	External Debt Stock to GDP Ratio	0	Geda and Yimer (2018)
	Country Case Studies				
	Kenya (1960–2009)	Time series(VECM)	External Debt Stock to GDP Ratio	-	Kinuthia and Murshed (2015)
	Cross-country and Panel Studies				
Exchange Rate Policy	45 African Countries	Panel data (1995-2012)	Real exchange rate	+	Geda and Yimer (2018)
	23 SSA countries	Panel data (1996–2010)	Real exchange rate	0	Okafor (2015)
	Country Case Studies				
	Kenya	Time series(VECM) (1960–2009)	Nominal Exchange rate	+	Kinuthia and Murshed(2015)
	Nigeria	Time series(VECM) (1970 – 2009)	Real Exchange rate	+	Okpara (2012)

	Cross-country and Panel Studies				
	45 African Countries	Panel data (1995-2012)	Political Stability Index	+	Geda and Yimer (2018)
			Government Effectiveness Index	+	
Institutions	African countries	Panel data (1996–2008)	Rule of Law Index	+	Anyanwu (2012)
	22 SSA countries	Panel data (1984–2000)	Government Effectiveness Index	+	Asiedu (2006)
	23 SSA countries	Panel data (1996–2010)	political instability index	0	Okafor (2015)
			Corruption index	0	
	Country case studies				
	Kenya	Time series(VECM) (1960–2009)	Governance Index	0	Kinuthia and Murshed(2015)
			Democracy Index	+	
			property rights index	+	
	South Africa,	Time series(VECM) (1956–2003)	political rights index	+	Fedderke and Romm (2006)
			political stability index	+	
	Cross-country and Panel Studies				
	23 SSA countries	Panel data (1996–2010)	Infrastructure investment to GDP	+	Okafor (2015)
Infrastructure	SADC	Panel data (1990–2007)	Gross fixed capital formation to GDP	+	Mupimpila and Okurut (2012)
	34 SSA countries	Panel data (1980-2000)	Telephone lines per 1000 people	+	Asiedu (2002)
	Country case studies				
	Nigeria	Time series(VECM) (1970 – 2009)	Gross capital formation to GDP ratio	+	Okpara (2012)
	Cameroon	Time series(VECM)	Electricity production and ratio of paved roads	+	Khan and Bamou (2006)
	Kenya	Time series(VECM) (1960–2009)	Authors constructed index	0	Fedderke and Romm (2006)
	Ethiopia	Time series Analysis (1974-2001)	Telephone lines per 1000 people	0	Haile and Assefa (2006)

Note: SSA is Sub-Saharan Africa; SADC is Southern Africa Development Community; X is Export and M is Import. '**+**' indicates significant positive, '**-**' indicates significant negative, and '0' represents no significant effect.

Table A2: Correlation Matrix of the Political and Institutional Indicators *(Polinst)*

Correlation *	rol	polstab	goveffe	corr	rq	voiacc
rol	1.00					
	-----					
polstab	-0.84	1.00				
	(0.00)	-----				
goveffe	0.71	-0.90	1.00			
	(0.00)	(0.00)	-----			
corr	0.77	-0.69	0.75	1.00		
	(0.00)	(0.00)	(0.00)	-----		
rq	0.71	-0.89	0.96	0.69	1.00	
	(0.00)	(0.00)	(0.00)	(0.00)	-----	
voiacc	-0.67	0.88	-0.84	-0.65	-0.77	1.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	-----

Where: *rol* is Rule of Law; *polstab* is Political Stability; *goveffe* is Government Effectiveness; *corr* is Control of Corruption; *rq* is Regulatory Quality; *voiacc* is Voice and Accountability. *P-Values in Parenthesis

Paper 4: The FDI-Growth Nexus in Africa

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The FDI-Growth Nexus in Africa

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Abstract

This paper investigates the FDI-growth nexus in Africa for the period 1990-2016 using a dynamic common correlated effects approach for an error-correction model. It uses an analytical classification of African economies, with each being fragile, factor-driven or investment-driven. It also accounts for institutional and political factors and the problem of cross-sectional dependence that previous studies overlooked. While the long-run effect of FDI on output is significantly positive in investment- and factor-driven economies, its short-run effect is insignificant in the latter type of economies. The effect of FDI on output is insignificant in the fragile category both in the short-run and long-run, however.

Keywords: FDI; Economic growth; Country classification; Institutions; Political stability; Africa

JEL classification codes: C23; F21; F43; O55

The FDI-Growth Nexus in Africa

Addis Yimer[♣]

1. Introduction

Foreign direct investment (FDI) inflows are important for growth in developing countries mainly for two reasons. First, as they represent one form of capital inflow to host countries, they increase the domestic capital stock which is scarce in these economies (De Mello, 1997; Jude and Levieuge, 2014). Second, they are believed to have a positive spillover effects to productivity improvements and output growth through the introduction of new technologies, human-capital development, and export promotion through access to foreign markets (Jude and Levieuge, 2014; Iamsiraroj, 2016).

Several theoretical arguments have been forwarded in the general literature on the positive contributions of FDI on economic growth in host countries. However, the empirical evidence so far on the growth impacts of FDI has not provided a conclusive result. Some studies have reported a positive effect of FDI on the growth of a host country's economy (see, e.g., De Gregorio, 1992; Blomström et al., 1996; Balasubramanyam et al., 1996; Basu et al., 2003; Hansen and Rand, 2006). Others argued that, although FDI is found to have a positive growth impact, the degree to which it positively affects growth depends on the availability of a number of factors in the recipient country. Such factors include, host country's existing level of human capital development (De Mello, 1997; Borensztein et al., 1998), initial level of per-capita income (Borensztein et al., 1998), the complementarity between FDI and domestic investment (De Mello, 1997), financial system development (Hermes and Lensink, 2003; Alfaro et al., 2004; Durham, 2004), openness and policies towards FDI (Balasubramanyam et al., 1996), the sectoral target of the incoming FDI (Dutt, 1997; Akinlo, 2004; Ayanwale, 2007), and the quality of institutions (Durham, 2004; Jude and Levieuge, 2014). On the other hand, some other studies have reported either a negative effect or the lack of robust positive effect on growth (see, e.g., Carkovic and Levine, 2005; Herzer et al., 2008).

Consistent with the dearth of literature about the FDI-growth relationship on the developing countries in general, little has been done to investigate such relationship in Africa. The little available cross-country and country case studies on Africa are not without limitations either. First, they fail to provide an in-depth analysis with discussion of country-specific factors that are

crucial in the FDI–growth relationship. Second, previous cross-country studies pool all different countries in one sample without due consideration for structural or behavioral differences that countries may have. The pooling of countries may lead to positive and negative effects to cancel out each other. This study departs from the approach taken by previous studies by using an analytical classification of African economies, with each being characterized as fragile, factor-driven, or investment-driven, and examines whether there are differences in the FDI-growth relationship across such groupings.[1] Third, despite evidence from economic literature supporting the role of good governance, political stability and strong institutions in affecting economic growth (see, e.g., Knack and Keefer, 1995; Acemoglu et al., 2001; Rodrik et al., 2004; Alesina et al., 1996; Mira and Hammadache, 2017), most FDI-growth studies generally deal with the economic determinants of economic growth, without due consideration for political and institutional factors. Given the fact that most African countries are oftentimes constrained by inefficient legal system in enforcing the rule of law, poor quality of the bureaucracy, widespread corruption, and political instability, it would seem that it is rather important for growth-related works on Africa to consider governance and institutional factors in their analysis. Fourth, most of the previous empirical undertakings on Africa do not give a sound theoretical foundation as a guide to their empirical findings. Moreover, another problem with assessing the effects of FDI on growth is endogeneity. Given the possible interdependency of these two variables, a proper test of endogeneity is, therefore, necessary. Most of the existing studies have not considered this necessity, however. Furthermore, they suffer from the problem of short time spans of available data. Finally, they also suffer from problems related with their econometric methodology; mainly from their failure to account for the problem of cross-sectional dependence and that of not accounting for long-run relationships in their analysis.

In order to bridge these gaps in the literature, this study revisits the FDI-growth nexus in Africa for the period 1990-2016 using a dynamic common correlated effect approach for an error-correction model. The empirical model is derived from a variant of endogenous growth theoretical models. The study departs from earlier studies which pool all different countries in one sample regardless of their structural or behavioral differences by using an analytical classification of African economies, with each being fragile, factor-driven or investment-driven, to account for country group heterogeneity. It also accounts for institutional and political factors and the problem of cross-sectional dependence that previous studies overlooked. In the empirical model, the effect of FDI on growth is investigated using the logged FDI variable as it stands (without interaction with other regressors) and with two interaction terms for it (an interaction term between logged FDI and logged human capital and an interaction term between logged FDI and the log of an aggregate measure of political and institutional quality). To complement the cointegration analysis, panel causality testing is undertaken using the Toda-Yamamoto approach to panel Granger-causality.

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[1] This study uses the new analytical African countries classification as fragile, factor driven, and investment driven economies outlined in Geda and Yimer (2018).

The remainder of this paper is organized as follows. The next section covers the background of the study in which the general pattern of FDI inflows and growth trends in Africa is discussed. Section three provides a critical review of the related theoretical and empirical literature. Section four presents the methodology for the study. Section five discusses the findings of the study. The final section summarizes the major findings and concludes the paper with some policy recommendations.

2. The General Pattern of FDI Inflows and Economic Growth in Africa

2.1 Overview of FDI inflows in Africa

Over the past three-and-half decades, FDI inflows to the various regions of the world have grown substantially (see Table 1). The total world FDI inflows grew significantly from US$ 13 billion in 1970 to reach an all-time peak of US$ 2 trillion in 2007 (UNCTAD, 2008), before dropping to US$ 1.5 and US$ 1.2 trillion in 2013 and 2014, respectively. Global FDI inflows fell by 16 percent in 2014 compared to the amount registered in 2013, but with considerable variation between the various regions and country groups (UNCTAD, 2016 and Table 1). Despite the declining worldwide tendency in recent years, FDI flows to developing economies reached their all-time high of US$ 681 billion in 2014, which represents 55 percent of the global FDI inflows for the same year (UNCTAD, 2016 and Table 1). However, the overall increase in the developing economies FDI inflows is predominantly a developing Asia story. Developing Asia constitutes the lion's share (nearly 70 percent) of the total FDI flows into developing economies in 2014 (UNCTAD, 2016 and Table 1). In Africa, FDI inflows amounted to an all-time high of US$ 59 billion in 2008. Following some ups and downs, FDI stood at US$ 54 billion in 2014, which is 3.4 percent lower than the historic high recorded in 2008 (UNCTAD, 2016 and Table 1). This surge in the FDI flows to the continent is, to a large extent, related to investments in extractive industries, although these flows have risen in various service sectors of the economy too (UNCTAD, 2016).

Table 1: Annual Inward FDI Flows in Billions of US$

Economy	Year					
	1980	1990	2000	2010	2013	2014
World	54.4	204.9	1363.2	1328.2	1467.1	1228.3
Developed	47.0	170.2	1125.2	673.2	696.8	498.8
Transition	0.0	0.1	5.8	75.1	99.6	48.1
Developing	7.4	34.6	232.2	579.9	670.8	681.4
Africa	0.4	2.8	9.6	44.1	54.0	53.9
America	6.3	8.5	79.6	131.7	186.2	159.4
Asia	0.6	22.9	142.8	401.9	427.9	465.3
Oceania	0.1	0.3	0.2	2.2	2.8	2.8

Source: UNCTAD (2016)

Despite the significant increase in FDI inflows to Africa in absolute terms over the years, the continent has attracted lesser share of FDI flows when compared to other major developing regions of the world (Table 1 and Figure 1). Figure 1 show, among other things, that FDI inflows to Africa constitute only 4.4 percent of global FDI inflows and about 10 percent of the flows to the developing world in 2014.
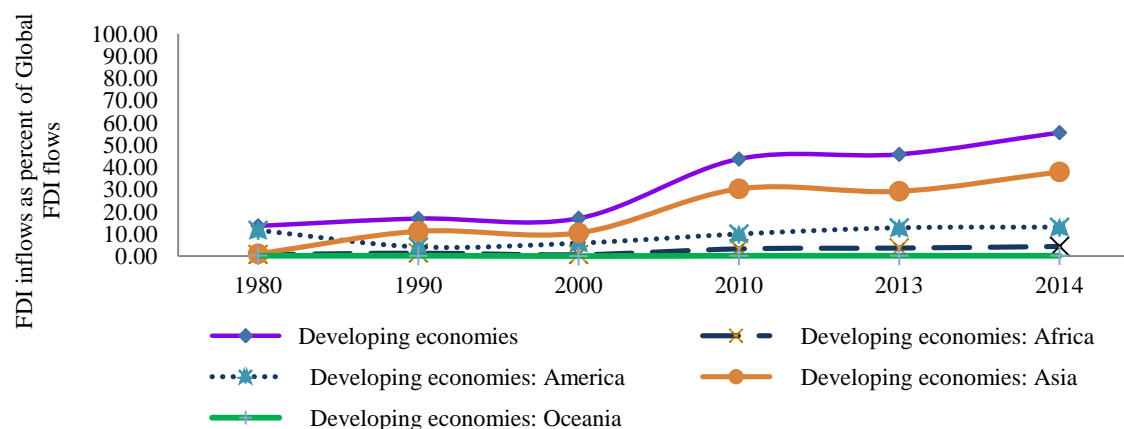
Figure 1: Inward FDI Flows by Region as Percentage of Global FDI Flows

Source: Author's computation based on UNCTAD (2016)

As noted by UNCTAD (2007), there was also a shift in the source of FDI, with Asian countries (especially China and India) playing a more active role in the economies of African countries through both Greenfield investments (foreign investment in new assets) and cross-border acquisitions (foreign investment related to the acquisition of existing assets). According to UNCTAD (2014), in 2014, four countries—France, The Netherlands, United Kingdom and United States—account for about half of the FDI inflows to Africa and half of this goes to Angola, Equatorial Guinea, Nigeria, Sudan and Egypt. Notwithstanding Africa's small share in global FDI inflows, the distribution of that FDI in Africa is extremely skewed, with the main recipients being very few countries. FDI hosting in Africa is mainly concentrated in South Africa, Congo Republic, Mozambique, Nigeria, Egypt, and Morocco which are the top six FDI destinations in Africa for the year 2014 (see Figure 2). These top six FDI destination countries have attracted more than 50 per cent of FDI inflows to the region.
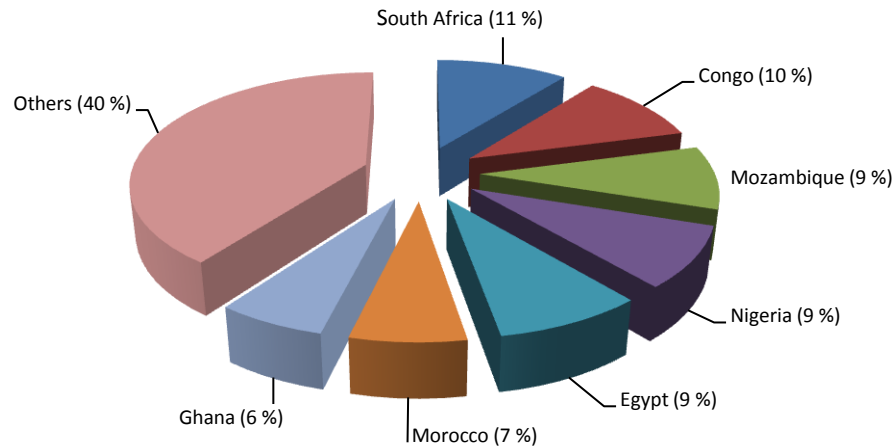
Figure 2: FDI Inflows to African Countries as Percentage of FDI Inflows to the Region in 2014
Note: Each county in "Others" has less than 6% of 2014 FDI inflows to the region.

Source: Author's computation based on UNCTAD (2016)

The main conclusions that can be made about the recent trends of FDI in Africa are the following. First, although the volume of FDI to Africa has increased significantly over the years, the share of Africa in the Global FDI inflows remains very marginal. For instance, by 2014, Africa's total FDI stock stood at US$ 393 billion, which is not that significant when compared to the US$ 465 billion FDI that developing Asia received for a single year of 2014 (UNCTAD, 2016). Second, the distribution of FDI in Africa is extremely skewed. Africa's top five FDI destination countries take more than 50 percent of the FDI inflows to the continent. Third, the sectoral[2] distribution of FDI to Africa is mainly concentrated in the primary sector—mainly in oil and gas extraction. Fourth, rising intra-African FDI (mainly from South Africa), expansion by emerging-market firms (largely from East Asia) are among the most important drivers that shape FDI trends to Africa (UNCTAD, 2015). Even though multinational corporations (MNCs) in emerging markets have become increasingly important in Africa, still those from the developed economies remained to be the major players (see UNCTAD, 2016).

2.2 Overview of Growth in Africa

In terms of GDP growth, in the first half of the 1990s average annual real GDP growth of the continent was about 1.8 percent. This has increased to an average value of 3.3 percent in the second half of the same period. This growth momentum continued until the mid-2000s when it had an average increase of 2.3 percent. This later reached an average value of 5.6 percent growth for the period 2000-2005. Partly due to the global economic slowdown in 2008 and 2009, and the fall in commodity prices in 2013 and thereafter, growth has declined to an average value of 5 percent for the period 2005-2010 and 3.2 percent during 2010-2015.

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[2] The top three sectors in terms of attracting FDI flows to Africa are primary (48 percent), service (31 percent) and the manufacturing sector (21 percent) (UNCTAD, 2015).

Table 2: Real GDP Growth in the World's Economies

Economy	Period				
	1990 - 1995	1995 – 2000	2000 - 2005	2005 - 2010	2010 - 2015
World	2.6	3.4	2.9	1.9	2.4
Developed	2.3	3.2	2.1	0.5	1.4
Transition	-9.9	1.5	6.6	3.6	1.7
Developing	5.2	4.3	5.4	5.9	4.7
Developing: Africa	1.8	3.3	5.6	5.0	3.2
Eastern Africa	2.6	3.7	4.4	6.9	6.8
Middle Africa	-1.5	2.9	7.1	6.9	4.5
Northern Africa	1.6	4.0	4.9	4.8	0.4
Southern Africa	2.7	2.6	3.8	3.0	2.3
Western Africa	2.0	3.3	8.7	6.1	5.2
Developing: America	3.1	3.1	2.7	3.4	2.4
Developing: Asia	7.1	5.0	6.6	6.9	5.6
Developing: Oceania	3.1	1.6	2.7	2.5	3.2

Source: UNCTAD (2016)

Overall, Africa in the last decade saw a strong growth in a number of countries from Eastern (such as: Ethiopia, Mozambique, Seychelles, Rwanda, Tanzania, Burundi, Zambia, Zimbabwe, Kenya and Djibouti), Western (such as: Sierra Leone, Ghana, Côte d'Ivoire, Liberia, Niger, Burkina Faso, Togo, Benin, Mauritania, and Nigeria) and Middle Africa (such as: Democratic republic of Congo, Chad, Cameroon, Botswana, and Namibia) (see UNCTAD, 2016 for detail).[3] According to Fosu (2012), Africa's growth performance over the past four decades could largely be explained by the performance of the total factor productivity (TFP) in the region. While the weak growth performance recorded in the 1980s and early 1990s is due to the decline in TFP, the growth resurgence in the late 1990s and onwards is mainly due to TFP improvements (Fosu, 2012).

3. Review of Literature

3.1. Theoretical Literature

In the literature, a number of theoretical mechanisms in which FDI can affect economic growth are identified. These include increased capital stock in the host economy (Solow, 1957; Buckley and Casson, 1976; Hymer, 1976; De Mello, 1997; Akinlo, 2004), technological improvement and know-how transfers (De Mello, 1997), improved productivity through labor trainings and managerial capability spillovers (Vernon, 1966; Kindleberger, 1969; Dunning, 1973; Hymer, 1976), increased competitiveness due to intense competition (Akinlo, 2004), and increased

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[3] The country classification as Eastern, Western, Northern, Southern, and Middle Africa is based on UNCTAD (2016). Only countries that registered an average growth of more than 5 percent for the period 2010-2015 are mentioned here.

market access through export promotions (Dunning, 1973; Balasubramanyam et al., 1996; Akinlo, 2004; among others).

In general, the theoretical literature on the growth impacts of FDI draws alternative views from the neoclassical and the endogenous models of economic growth. According to the neoclassical growth models, long-term economic growth is assumed to generate only from technological innovation and growth in the labor force of the economy (see, e.g., Solow, 1957; De Mello, 1997; Iamsiraroj and Ulubasoglu, 2015; Iamsiraroj, 2016). Given the assumption of diminishing marginal returns to capital in these models, the growth impact of FDI is limited to the short-run only (Herzer et al., 2008; Iamsiraroj and Ulubasoglu, 2015; Iamsiraroj, 2016). In response to the weaknesses noted in the neoclassical growth models, the endogenous growth theories have attempted to establish a connection between increased FDI and economic growth by emphasizing the role of technological change, technology transfer, diffusion, and spillover effects on growth (Herzer et al., 2008; Iamsiraroj, 2016).

In contrast to their neoclassical counterparts, in the endogenous growth models, FDI into a country is assumed to be an important source of additional productive input and means of knowledge and technology transfer that will help to promote long-run economic growth (De Mello, 1997; Borensztein et al., 1998; Akinlo, 2004; Li and Liu, 2005; Herzer et al., 2008; Iamsiraroj, 2016). Thus, through its direct impact on capital accumulation and indirect effect through knowledge spillovers, FDI may contribute positively to the economic growth of host countries (Iamsiraroj, 2016).

However, FDI could also negatively affect economic growth in the FDI host countries. For instance, if new entries of foreign-affiliated firms crowd-out domestic firms, growth in the FDI recipient country may be constrained (Misun and Tomsik, 2002; Herzer et al., 2008). This may be particularly true in African states where weak managerial practices and backward production capabilities characterize most of the domestic firms compared to their peers of MNCs based in advanced countries (see Iwasaki and Tokunaga, 2014). In addition, the dependency-school theorists claim that dependence on FDI could have an adverse effect on host country's economic growth and income distribution (Adams, 2009). FDI may also have a negative effect on host country's economic growth if it results to a significant amount of capital outflows in the form of returns on investment (Ramirez, 2000; Akinlo, 2004). Moreover, the "adverse incentive effect" hypothesis which is pointed out by Easterly (1993) is also a case to consider in relation to the negative effects of FDI in host economies. Favorable tax treatments and other incentives given to foreign investors might significantly distort incentives for domestic firms and thus adversely affect host country's economic growth (Easterly, 1993; Iwasaki and Tokunaga, 2014). This may be relevant to Africa where many of the countries have put in place several foreign investor friendly incentive packages to attract more FDI to their economies.

In broadly similar terms, several other authors have argued that FDI might have no effect on growth on its own. Rather, they have emphasized its effect on growth as conditional upon the quality of other socio-economic and political factors prevailing in the recipient countries. For instance, it is argued that host country's absorption capacity is detrimental for FDI to contribute for growth in a meaningful way (Borensztein et al., 1998; Akinlo, 2004; Durham, 2004; Iwasaki and Tokunaga, 2014). This may also be relevant for African countries where low levels of education and weak domestic firms' absorption capability characterize domestic enterprises in the continent.

Despite the theoretical controversies that surround the FDI-growth nexus, there is a broad consensus on the view which suggests that FDI's positive impact on economic growth in developing countries is dependent upon the economic and political conditions in the host country. Such factors include the level of per capita income, the initial level human capital development, the degree of openness in the economy, the degree of domestic financial-markets development, the political conditions and the institutional qualities that avail in the country. Nevertheless, the effect of FDI inflows on growth still remains as an empirical issue, which is discussed next.

3.2. Empirical Literature

The empirical literature that examines the impact of FDI on economic growth of developing countries in general is voluminous.[4] This section reviews the main contributions and critiques on the empirical methods employed in studies of the developing world at large and African countries in particular.

In general, the empirical FDI-growth relation literature has been based on both cross-country and panel data analysis (see, e.g., Blomström et al., 1996; Borenztein et al., 1998; Basu et al., 2003; Lumbila, 2005; Herzer et al., 2008; Adams, 2009; Iamsiraroj, 2016; Zghidi et al., 2016) as well as country case studies (see, e.g., Kokko, 1994; Blomström et al., 1996; Akinlo, 2004; Ayanwale, 2007; Onu, 2012; Omri and Sassi-Tmar, 2015). However, mixed results from these studies have been reported. This is partly due to differences in model specifications and variables used, the countries considered in their analysis, and the econometric techniques employed.

Some studies from the developing world have found that FDI could positively affect economic growth through capital accumulation, spillover effects such as new technologies, increased export, and human capital development (Balasubramanyam, et al., 1996; Borensztein et al., 1998; Nair-Reichert and Weinhold 2001; Liu et al., 2002; Akinlo, 2004; see Table A1 in the Appendix also). However, such positive impact is also found to be a function of the availability

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[4] This section only provides a brief summary of the related studies. A selection of the empirical evidence found in the developing world at large is given in Table A1 in the Appendix. See Solow (1957) and De Mello (1997, among several others, for detailed survey of the theoretical and empirical literature.

of several positively contributing factors, such as the level of development (Blomström et al., 1996), human capital (Borensztein et al., 1998), open trade and investment regime (Balasubramanyam et al., 1996; Basu et al., 2003), the sectoral target of FDI (Akinlo, 2004; Ayanwale, 2007) and financial market development (Hermes and Lensink, 2003; Durham, 2004; Alfaro et al., 2004), among other things.

On the other hand, some other studies have found that FDI inflows have had a negative effect on growth in some countries by crowding-out domestic firms that results in adverse effects on economic growth (see, e.g., Bende-Nabende et al., 2002, 2003; Adams; 2009), while others (see, e.g., Carkovic and Levine, 2005) do not confirm a robust, positive impact of FDI on economic growth.

The existing few African studies on the effect of FDI on growth (which are mostly country case studies) have also reported mixed findings. For instance, from studies using panel data technique, Lumbila (2005) for 47 SSA countries and Brambila-Macias and Massa (2010) for 27 SSA countries reported a significant positive impact of FDI on economic growth. On the other hand, Adams (2009) reported a mixed result that depends on the estimation technique used. Adams (2009) found that the effect of FDI is positive and significant only when the OLS estimation technique is used but, in the fixed effects estimation, he found the effect of FDI on growth to be insignificant. For five West Africa Monetary Zone (WAMZ) countries, Udo and Obiora (2006) found no evidence to indicate that a two-way causal relationship existed between FDI and economic growth. Similarly, mixed results are reported in country case studies in Africa. For instance, Fedderke and Romm (2006) have found that the growth impact of foreign direct investment is indeed positive for South Africa and that long-run causality runs from FDI to growth. Similarly, Ayanwale (2007) reported that FDI in Nigeria contributed positively to economic growth. Akinlo (2004), on the other hand, did not confirm the positive result found in Fedderke and Romm (2006) and Ayanwale (2007), and instead reported a statistically insignificant effect of FDI on economic growth in Nigeria.

Table 3: Some Selected Studies on the FDI-Growth Nexus in Africa

Author	Countries	Methodology	Results
Akinlo (2004)	Nigeria	Time series cointegration (1970-2001)	FDI has no impact on growth in Nigeria
Fedderke and Romm (2006).	South Africa	Time series cointegration (1956-2003)	FDI and GDP are cointegrated and that long-run causality runs from FDI to GDP
Lumbila (2005)	47 African countries	Panel random effect (1980-2000)	FDI has a positive impact on growth
Udo & Obiora (2006)	5 WAMZ countries	Panel simultaneous-equations method (1980-2002)	No evidence of a two-way causal relationship between FDI flows and economic growth. Rather FDI tends to be attracted by high per capita income,
Ayanwale (2007)	Nigeria	Time series 2SLS method (1970-2002)	FDI positively contributes to economic growth depending on sector.
Adams (2009)	42 SSA countries	Panel OLS and fixed effect	FDI has positive and significant effect on growth only when the OLS estimation technique is used. The effect of FDI on growth is insignificant in the fixed effects estimation.
Brambila-Macias & Massa (2010)	15 sub-Saharan African countries.	Generalized Method of Moments (GMM) (1980-2008)	FDI exert a significant and positive impact on SSA growth
Onu (2012)	Nigeria	Time series pair wise granger causality (1986-2007)	FDI has not contributed to economic growth. Unidirectional relationship between GDP and FDI that ran from GDP to FDI, not otherwise.
Adeniyi et al. (2012)	Cote' d'Ivoire, Gambia, Ghana, Nigeria and Sierra Leone)	Time series cointegration	FDI positively affects economic growth in Ghana, Gambia, Sierra Leone and Nigeria. No effect and casual relationship for Cote' d'Ivoire.
Zghidi et al. (2016)	4 North African countries (Tunisia, Morocco, Algeria and Egypt)	GMM	Strong evidence of a positive link between FDI and economic growth.

One possible explanation for these mixed findings may be the failure to model interaction effects in the relationship between FDI and growth on one hand and methodological and host-country differences on the other. However, the conclusion that can be drawn from the existing empirical literature is that positive growth effects from FDI are conditional on initial conditions of the host country, including the absorptive capacity, level of development, trade openness, human capital, financial development and the business environment at large, among other things.

There are several shortcomings with the existing empirical literature on the FDI-growth relation, however. One major problem that may apply to most studies reviewed here is that they consider the FDI-growth relationship to be determined only by macroeconomic fundamentals, largely

overlooking the issues of governance, institutions and political conditions in FDI host economies. However, poor quality institutions, bad governances and political instability are oftentimes associated with poor overall economic performances (Easterly and Levine, 1997; Acemoglu et al., 2001; Rodrik et al., 2004; Jude and Levieuge, 2014).

In addition, the existing studies suffer from methodological and data-related problems. For instance, cross-country studies pool all different countries in one sample without due consideration for structural differences between countries (see, e.g., Blomström et al., 1996; Balasubramanyam et al., 1996; Borenztein et al., 1998; Lumbila, 2005; Hansen and Rand, 2006; Adams, 2009). Given the fact that countries vary in their socioeconomic, institutional and political environments, the growth effects of FDI are also likely to differ across countries, which these studies have not considered. Thus, unaccounted-for cross-country parameter heterogeneity is a major problem for these studies. In addition, as noted by Herzer et al. (2008), the problem of endoginiety bias is a concern for the cross-country studies (see, e.g., Blomström et al., 1996; Balasubramanyam et al., 1996; Borensztein et al., 1998).

A common problem to both the traditional cross-country and panel-data techniques studies on the FDI -growth literature is also that these studies failed to consider problems arising from non-stationarity in the data. As a result, they ignored there being a potential long-run relationship between FDI and output as the relationship between these variables was established using only the first differences of the variables in the model (see, e.g., De Mello, 1997; Brambila-Macias and Massa, 2010; Zghidi et al., 2016). However, the exclusion of a potential long-run relationship between the levels of the variables can bias the results due to the resulting misspecification error (Ericsson et al., 2001; Herzer et al., 2008). In order to address the latter, there has emerged another generation of studies, which use cointegration analysis (Herzer et al., 2008), both for a panel of countries (see, e.g., Basu et al., 2003; Hansen and Rand, 2006) and for single-country time-series data (see, e.g., Zhang, 2001; Ramírez, 2000; Fedderke and Romm, 2006). However, parameter heterogeneity remains an issue for the panel studies (Herzer et al., 2008).

A serious problem for the entire set of previous panel data studies reviewed here is their assumption of there is no problem of cross-sectional error dependence. However, cross-sectional error dependence in panel data applications in economics is a common phenomenon (Chudik and Pesaran, 2015a). If left unaccounted-for in the econometric technique, result may be misleading (Chudik and Pesaran, 2015a).

The time-series studies also have their own limitations. Most time-series studies on the FDI-growth relation use the VAR-based Johansen (1995) cointegration techniques (Herzer et al., 2008), to estimate their model (see, e.g., Ramírez, 2000; Zhang, 2001; Akinlo, 2004; Fedderke and Romm, 2006; Adeniyi et al., 2012). However, this approach is quite demanding in needing a long-time series of data. Given the problem of small samples, which are common in time-series

studies in this area, this approach may falsely reject the null of no cointegration more frequently than expected (Herzer et al., 2008).

Given the limitations in previous studies noted above, this study re-visits the FDI-growth nexus over the period 1990-2016 for 46 African countries, 11 of which are classified economically as investment-driven, 23 as factor-driven, and 12 as fragile economies (see Table A2 in the Appendix for the countries included in each of the classifications, and see Geda and Yimer (2018) for the basis of the country classifications).[5]

4. Methodology

4.1 The Theoretical Model

This paper will follow a variant of an endogenous growth model to investigate the effects of FDI on economic growth in Africa, including both the direct effects (by increasing the domestic physical capital stock) and the interaction effects (between human capital and FDI and between an aggregate measure of political and institutional indicator and FDI). As such, it closely follows the formulation given in Akinlo (2004)[6] and augments the explanatory variables in this variant of models by including two policy variables (measures of openness and financial system development), international commodity price, institutional and political factors, and by two interaction terms (between human capital and FDI and between an aggregate measure of political and institutional indicator and FDI). These augmentations distinguish the generalized model used in this research from the traditional endogenous growth model.

A variant of the production function in an endogenous-growth-model context in which FDI is explicitly incorporated as a factor input can be specified as

$$Y = A(\lambda L)^\alpha K_d^\beta \mu^{1-\alpha-\beta} \text{ and } \lambda = H^z \tag{1}$$

in which A denotes exogenous economic, political and institutional factors which influence productivity in the economy. Y denotes real GDP, and K_d is real domestic capital stock. The stock of domestic capital is generated using the standard perpetual inventory method after taking the difference between gross capital formation and FDI inflows. This is motivated by the need to find a way to net-out the foreign investment component of the overall investment in the economy (see Neuhaus, 2006 for a similar application). The easiest and most commonly used procedure in

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[5] Overall, the numbers of countries classified in Geda and Yimer (2018) as investment-driven, factor-driven, and fragile are 11, 24, and 19, respectively. However, due to lack of a complete data set for the variables of the current study, the numbers of countries used in the empirical model for factor-driven and fragile economies are reduced to 23 and 12, respectively. On the other hand, all the 11 countries classified as investment–driven economies are used in the empirical model as there is a complete data for the variables of interest for this group of countries (see Table A2 in the Appendix).

[6] It is also informed by the works of De Mello (1997), Borsworth et al. (1999), and Ramirez (2000).

the literature to do so is to deduct the values of FDI inflows from gross capital formation (Neuhaus, 2006). L and λ are labor input and the level of human capital, respectively. H and z are measures of educational level and the return to education relative to labor input, respectively. Evidence from empirical studies suggests that the degree to which the population is educated and skilled is a key determinant of economic growth (see, e.g., Barro and Sala-i-Martin, 1997). This study uses a measure of human capital based on years of schooling and returns to education as given in Feenstra et al. (2016). This measure of educational attainment is one of the variables that are most significantly correlated with growth in previous studies and is a widely used variable to capture the effects of human capital on economic growth (Barro and Lee, 2013). μ is the externality generated by additions to the stock of FDI and α and β are the shares of labor and domestic capital, respectively. It is assumed that there are diminishing returns to labor and capital in production, i.e., α and β are less than one.

The externality generated by additions to the stock of FDI, μ, can be represented by a Cobb–Douglas functional form (see Akinlo, 2004)

$$\mu = \left\{ (\lambda L) K_d K_f^{\sigma} \right\}^{\gamma} \tag{2}$$

where K_f is FDI capital stock. As noted by De Mello (1997), Ramirez (2000), .and also by Neuhaus (2006), the stock of FDI is more accurate than the flows in capturing the sustaining effect of FDI on the growth of host countries' economy.[7] σ is the marginal elasticity of substitution between private and foreign capital and γ is the intertemporal elasticity of substitution between private and foreign capital, respectively.

Following Akinlo (2004), let $\sigma > 0$, such that a higher FDI stock yields a positive externality to the host country's economy. If $\gamma > 0$, intertemporal complimentarity prevails and, if $\gamma < 0$, additions to the FDI stock crowd out domestic capital over time and diminish the growth potential of the host country (Akinlo, 2004).

By substituting Eq. (2) into Eq. (1) for μ, Eq. (1) can be rewritten as:

$$Y = A(\lambda L)^{\alpha} K_d^{\beta} \left[\left\{ (\lambda L) K_d K_f^{\sigma} \right\}^{\gamma} \right]^{1-\alpha-\beta} \tag{3}$$

$$= A(\lambda L)^{\alpha} K_d^{\beta} \left[(\lambda L)^{\gamma(1-\alpha-\beta)} K_d^{\gamma(1-\alpha-\beta)} K_f^{\sigma\gamma(1-\alpha-\beta)} \right] \tag{4}$$

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[7] UNCTAD (2016) definition of FDI stock is used in this study. UNCTAD (2016) calculates FDI stock using the perpetual inventory method. FDI stock is defined as 'the value of the share of capital and reserves (including retained profits) attributable to the parent enterprise, plus the net indebtedness of affiliates to the parent enterprises. It is approximated by the accumulated value of past FDI flows' (UNCTAD, 2016).

$$= A\left((\lambda L)^\alpha \; (\lambda L)^{\gamma(1-\alpha-\beta)}\right) \left(K_d^\beta K_d^{\gamma(1-\alpha-\beta)}\right) \left(K_f^{\sigma\gamma(1-\alpha-\beta)}\right) \tag{5}$$

After factorization for like terms, Eq. (5) becomes:

$$Y = A(\lambda L)^{\alpha+\gamma(1-\alpha-\beta)} \; K_d^{\beta+\gamma(1-\alpha-\beta)} K_f^{\sigma\gamma(1-\alpha-\beta)} \tag{6}$$

Substituting $\lambda = H^z$, Eq. (6) becomes:

$$Y = A(H^z L)^{\alpha+\gamma(1-\alpha-\beta)} \; K_d^{\beta+\gamma(1-\alpha-\beta)} K_f^{\sigma\gamma(1-\alpha-\beta)} \tag{7}$$

A standard growth accounting equation can then be derived by taking the natural logarithms and time derivatives of Eq. (7) to generate the dynamic production function. Thus, the natural log transformation of Eq. (7) would be (Akinlo, 2004):

$$logY = logA + z[\alpha + \gamma(1-\alpha-\beta)]logH + [\alpha + \gamma(1-\alpha-\beta)]logL$$
$$+[\beta + \gamma(1-\alpha-\beta)]logK_d + [\sigma\gamma(1-\alpha-\beta)]logK_f \tag{8}$$

4.2 The Cointegrating Empirical Model

Augmenting Eq. (8) by two interaction terms (between human capital stock and the stock of FDI and between an aggregate measure of political and institutional indicator and the stock of FDI) trade openness (OP), financial system development ($M2GDP$), international commodity price variables (CP), and an aggregate measure of political and institutional quality ($POLINS$), the long-run equation to be estimated in this study can be specified as:

$$logY_{it} = d_0 + d_1 logL_{it} + d_2 logK_{it}^d + d_3 logFDI_{it} + d_4 logH_{it} + d_5(logH_{it} * logFDI_{it}) + d_6 OP_{it} +$$
$$d_7 logM2GDP_{it} + d_8 logCP_{it} + d_9 POLINS_{it} + d_{10}(POLINS_{it} * logFDI_{it}) + \varepsilon_{it} \tag{9}$$

where the subscripts i identifies countries, the t subscript is for time and ε_{it} is an error term. The reasons for including these augmenting variables, along with how these variables are calculated, are provided below.

For trade openness (OP), the trade share (calculated as the ratio of exports and imports of goods and services to GDP) adjusted for population size is considered.[8] This is done by running a

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[8] The need for adjusting trade share for population size is motivated by the fact that "small countries (in terms of their population size) generally need to trade more with the outside world to provide all available goods for the domestic economy. On the other hand, large countries usually trade less with other nations. Thus, higher trade within the domestic economy should not be taken either as an implication for less degree of competitiveness or as an

regression on the log of the trade share (TS) on the log of the population size (POP), either on a panel of countries or for each cross-section in the panel (see Neuhaus, 2006 for similar application). The resulting residuals are then taken as a trade share adjusted for population size.[9] Trade openness can positively contribute to economic growth through its efficiency effect in the allocation of scarce economic resources and productivity improvements through technological and skills transfer (Barro and Sala-i-Martin, 1997; Keho, 2017). For financial system development, the ratio of broad money supply ($M2$) to GDP ratio ($M2GDP$) is used. Financial development helps to stimulate economic growth by channeling scarce resources to the most productive sectors of the economy.[10]

Given the fact that commodity price movements are closely related to economic growth in Africa (see Anyanwu, 2014; UNCTAD, 2017), the international commodity price index (CP) is incorporated in the estimated growth equation in this study (see Deaton and Miller, 1996; Collier and Goderis, 2012; Anyanwu, 2014 for similar application).

An aggregate measure of political and institutional indicators ($POLINS$) is incorporated given the fact that countries with good institutions and political stability tend to grow faster than others with weaker institutions and poor political stability (Easterly and Levine, 1997; Acemoglu et al., 2001). Well-developed institutions (Jude and Levieuge, 2014), better governance (Asiedu, 2002) and political stability (Alfaro et al., 2004; Carkovic and Levine, 2005) enhance the overall benefits of FDI on economic growth. These factors can promote better linkages between FDI and domestic firms and stimulate knowledge transfer to domestic firms and improve productivity gains (Jude and Levieuge, 2014). It can thus be argued that better political stability and good governance as well as better developed institutions stimulate economic growth in FDI host economies, making FDI into these countries more effective, which is why the interaction of *POLINS* with log *FDI* is included as an explanatory variable in Eq. (9), in addition to *POLINS*.

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implication for the less efficiency of it than international trade" (Neuhaus, 2006). Thus, to account for this, the population effect from the trade share should be taken out (see Neuhaus, 2006).

[9] For instance, using the following panel regression will generate the residuals to be used as the variable on trade share adjusted for population size. Run the regression given as $ln\, TS_{it} = \beta_1 ln\, POP_{it} + \varepsilon_{it}$, where TS_{it} is trade share measured as $[(export + import)/GDP] * 100$ and POP_{it} is total population for country i at time t. The residuals, ε_{it}, provide the data for the trade share adjusted for population size (see Neuhaus, 2006). Note that this variable will be used in regressions without its log transformation (see Neuhaus, 2006).

[10] The relationship between financial sector development and economic growth has been studied extensively, typically resulting in the conclusion that a well-developed financial system promotes productivity growth and economic growth (Alfaro et al., 2004; Hermes and Lensink, 2003). But, it can equally be argued that, especially for African countries, a well-developed financial system may hamper growth depending on whether financial development reduces or increases capital flight. For instance, Geda and Yimer (2016) reported a positive effect of financial sector development on capital flight in Ethiopia. On another study, Geda and Yimer (2017) found the significant negative effect of capital flight on economic growth in Ethiopia. In a FDI-growth study, Akinlo (2004) reported a negative effect of financial development on growth by increasing capital flight in Nigeria.

A series of governance, institutional and political condition indicators have been developed by various international institutions and the research academia. The current study uses the World Governance Indicators (WGI) dataset of the World Bank (2017b) - due to its comprehensiveness - to capture the effects of governance, quality of institutions, and political instability on the FDI-Growth nexus in Africa.

The WGI dataset constructs six aggregate indicators of broad dimensions of governance. These are voice and accountability, political stability, government effectiveness, regulatory quality, and the rule of law and control of corruption (Kaufmann et al., 2010).[11] This study uses three of them, collectively referred to as the $POLINS$ variables, as discussed below.

The Political Stability (POL) indicator reflects "perceptions of the likelihood that the government will be overthrown or destabilized by unconstitutional or violent means" (Kaufmann et al., 2010). The Regulatory Quality (RQ) indicator reflects "perceptions of the ability of the government to formulate and implement sound policies and regulations that promote private sector development" (Kaufmann et al., 2010). The Rule of Law (RL) indicator reflects "perceptions of the extent to which agents have confidence in and abide by the rules of society, and the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence" (Kaufmann et al., 2010). As there is high correlation among the variables and the possibility of high degree multicollinearity among them (see Table A3 in the Appendix), an aggregate sum (after normalization) of these three variables is taken in the empirical estimation of the model.[12]

4.3 The Econometric Technique

In panel data models, the presence of error cross-sectional dependence in most panels poses a challenge in estimation of such models (Everaert and De Groote, 2016). Cross-sectional error dependence could arise as a result of unobserved and unaccounted common factors, spatial effects, regional linkages, and socioeconomic interaction spillover effects (Phillips and Sul, 2003; Pesaran, 2006; Chudik and Pesaran, 2015a; Chudik and Pesaran, 2015b).

Traditional panel data estimation techniques typically assume independence of cross-correlation of errors in the cross-sections contained in the panel (Phillips and Sul, 2003; Pesaran, 2006; Chudik and Pesaran, 2015a; Chudik and Pesaran, 2015b). However, if observations are cross-

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[11] Details on the underlying data sources, the aggregation method, and the interpretation of the indicators, can be found in the WGI methodology paper of Kaufmann et al. (2010).

[12] The aggregate political and institutional indicator ($POLINS$) is computed from normalized values of the three indicators (Political stability, regulatory quality, and rule of law). The normalization is done using the following formula: for any x, $x_{normalized} = (x - x_{minimum})/(x_{maximum} - x_{minimum}) = (x - (-2.5))/(2.5 - (-2.5))$. This is done on a yearly basis for each country in the models. Then a simple sum (assigning equal weights) of the normalized values for the three variables is taken on a yearly basis for each country.

sectionally dependent, traditional panel data estimators are inefficient and estimated standard errors are biased and inconsistent (Everaert and De Groote, 2016). In general, the presence of unaccounted common factor that is somehow correlated with the regressors leads to inconsistency of the traditional panel estimators due to the resulting omitted-variables bias (Pesaran, 2006).

In this study, the dynamic common correlated effects estimation procedure developed by Chudik and Pesaran (2015b) is followed. The Chudik and Pesaran (2015b) approach closely follows the Pesaran (2006) common correlated effects (CCE) estimator but is made to provide consistent estimates in dynamic panels.

The CCE estimator with heterogeneous coefficients starts by assuming the following data generating process using a generic dependent variable, y_{it}, and a generic vector of explanatory variables, $x_{i,t}$ (see Ditzen, 2016):

$$y_{it} = \alpha_i + \beta_i x_{i,t} + u_{i,t}$$

$$u_{i,t} = \gamma_i' f_t + e_{i,t} \qquad (10)$$

where γ_i is a heterogeneous factor loading and f_t is a vector of unobserved common factors and $\beta_i = \beta + v_i, v_i \sim iid(0, \Omega_v)$ (Pesaran and Smith, 1995).

Pesaran (2006) suggests that, under strict exogeneity of $x_{i,t}$, Eq. (10) can be estimated consistently using the CCE estimation procedure (Ditzen, 2016). The CCE procedure consists of approximating the linear combinations of the unobserved factors by cross-sectional averages of the dependent and explanatory variables, and then running standard panel regressions augmented with these cross-sectional averages (Chudik and Pesaran, 2015b). Both pooled and mean group versions are proposed, depending on the assumption regarding the slope homogeneity (Chudik and Pesaran, 2015b).

However, the CCE procedure is applicable only under the assumption of strict exogeneity of the regressors (Chudik and Pesaran, 2015b; Ditzen, 2016; Everaert and De Groote, 2016). Thus, Pesaran's (2006) CCE approach is not applicable in panel data models where there is weakly exogenous regressors in the regression equation (Chudik and Pesaran, 2015a and 2015b). Chudik and Pesaran (2015b) showed consistency for the CCE estimator only in the case of non-dynamic panels (see also Ditzen, 2016; Everaert and De Groote, 2016). An extension of the CCE approach to deal with dynamic panels with heterogeneous coefficients and weakly exogenous regressors was proposed by Chudik and Pesaran (2015b) and is referred to as "dynamic CCE".

Consider a dynamic panel setup specified as (see Ditzen, 2016):

$$y_{it} = \alpha_i + \lambda_i y_{i,t-1} + \beta_i x_{i,t} + u_{i,t} \tag{11}$$

where $u_{i,t}$ represent cross-sectionally weakly dependent idiosyncratic errors and $E(\lambda_i) = \lambda$. In this set up, since $y_{i,t-1}$ is no longer strictly exogenous, the CCE estimator will be inconsistent (Chudik and Pesaran, 2015b; Ditzen, 2016).

Chudik and Pesaran (2015b), however, showed that if $\sqrt[3]{T}$ lags of the cross-section means are included in the regression, the CCE estimator will be consistent (Chudik and Pesaran, 2015b; Ditzen, 2016). Following this, the equation to be estimated then becomes (see Ditzen, 2016):

$$y_{it} = \alpha_i + \lambda_i y_{i,t-1} + \beta_i x_{i,t} + \sum_{t=0}^{p} \delta'_{i,t} \bar{z}_{t-l} + e_{i,t} \tag{12}$$

where $\bar{z}_t = (\bar{y}_{t-1}, \bar{x}_t)$ and p is the number of lags.

5. Discussion of Results

In this section, the empirically estimated results are discussed. Before carrying out any empirical estimation of the model, pre-estimation tests on the variables are undertaken. Such tests include cross-section dependence tests, unit-root tests, and tests for cointegration. The results of these tests are presented below.[13]

5.1 Cross-sectional Dependence

In macro-panel studies (such as this study), in general, regional linkages and macroeconomic interdependences manifested through shared institutions, common shocks, and local spillover effects between countries or regions usually creates the problem of cross-sectional dependence (Kapetanios et al., 2011).[14] As a result, the assumption of there is no problem of cross-sectional dependence in the existence of the omitted common factors can result to misleading statistical inferences (Kapetanios et al., 2011; Chudik et al., 2016). In addition, traditional panel unit-root and cointegration tests based on the assumption of cross-sectional independence are generally inadequate (Chang, 2002; Pesaran, 2007). Therefore, before examining the order of integration of our series and testing for co-integration, a test for cross-sectional dependence should be undertaken.

A number of cross-sectional dependence (CD) tests are available in the econometric literature.[15] This study uses Pesaran's (2004) CD test which tests the null hypothesis of independence across

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[13] STATA 14 is used for the data analysis in this study.
[14] Cross-sectional dependence is found to be a very common problem for a large empirical macro and macro-finance literature (see Kapetanios et al., 2011).
[15] See Pesaran (2006, 2007), Chudik et al. (2016) for a detailed critical review of the various CD-tests present in the literature.

the cross sections. One of the key features of this test is its robustness to structural breaks (Pesaran, 2007). The *CD* test can be used both on observable variables and on residuals from a panel regression (see also Liddle, 2017). Referring to the estimated pair-wise correlation coefficients between the time series (either for a observable variable or for residuals from panel estimation) for every country pair i and j as $\hat{\rho}_{ij}$, and noting that for a dataset with N countries there would be the N times $N-1$ correlations between country i and all other countries for $i=1$ to $N-1$, the Pesaran CD statistic is computed as

$$CD_p = \sqrt{\frac{2T}{N(N-1)}}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}\right) \tag{13}$$

which convergences to N(0,1) under the null hypothesis of cross-sectional independence.[16]

Table 4 reports the CD test statistics and the accompanied *p*-values for the variables used in this study. The results of the test show that the null hypothesis of there is no problem of cross-sectional dependence is rejected for all of the variables of the model (see Table 4). The apparent cross-sectional dependence may be due to unaccounted regional and macroeconomic linkages, unobserved common factors and externalities. Thus, the problem of cross-sectional dependence should be taken into account in the next steps of the analysis.

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[16] The post-estimation CD-test proposed by Pesaran (2004) is based on the averages of all pair-wise correlations of the ordinary least squares (OLS) residuals obtained from the individual regressions in the panel data model. In this case $\hat{\rho}_{ij}$ is the estimated pair-wise correlation for the residuals, given as $\hat{\rho}_{ij} = \hat{\rho}_{ji} = [\sum_{t=1}^{T}\hat{\varepsilon}_{it}\hat{\varepsilon}_{jt}]/[(\sum_{t=1}^{T}\hat{\varepsilon}_{it}^2)^{1/2}(\sum_{t=1}^{T}\hat{\varepsilon}_{jt}^2)^{1/2}]$ (see Pesaran, 2004). It should be noted that Eq. (13) is only applicable for the cases when the panel is a balanced one. For unbalanced panel a different test equation should be used (see Pesaran, 2004).

Table 4: Pesaran (2004) Cross-sectional Dependence (CD) Test Results

Variable	Investment-Driven	Factor-Driven	Fragile
ln real GDP	32.99	26.90	23.99
	(0.00)	(0.00)	(0.00)
ln human capital	15.60	21.98	10.03
	(0.00)	(0.00)	(0.00)
ln labor force	32.94	30.04	24.34
	(0.00)	(0.00)	(0.00)
ln domestic capital stock	32.76	34.05	19.24
	(0.00)	(0.00)	(0.00)
ln FDI stock	30.47	21.00	36.65
	(0.00)	(0.00)	(0.00)
trade openness	4.68	5.06	3.00
	(0.00)	(0.00)	(0.00)
ln M2 to GDP	4.68	5.06	3.00
	(0.00)	(0.00)	(0.00)
ln Commodity Price	14.90	31.08	16.06
	(0.00)	(0.00)	(0.00)
POLINS	3.30	3.52.	4.09
	(0.07)	0.08)	(0.03)
*ln human capital*ln FDI stock*	32.47	29.07	22.01
	(0.00)	(0.00)	(0.00)
POLINS ln FDI stock*	12.06	10.01	15.13
	(0.00)	(0.00)	(0.00)

Notes: CD_p values shown, with p-values shown in parentheses regarding the null hypothesis of there being no problem of cross-sectional dependence, in which case $CD_p \sim N(0,1)$. A prefix *ln* indicates the natural log transformation of that variable. For the empirical analysis there are 11 countries classified economically as investment-driven, 23 as factor-driven and 12 as fragile. See Table A2 in the Appendix for the countries included in each of the three economy-type categories.

5.2. Panel Unit Root Tests

The literature on panel unit-root and cointegration tests can be classified into two groups: first and second-generation unit-root and cointegration tests; where the first group developed on the assumption of there is no problem of cross-sectional dependence while the second takes into account the presence of cross-sectional dependence in most panels.

The first-generation unit-root tests include, among others, those proposed by Maddala and Wu (1999), Hadri (2000), Choi (2001), Levin, Lin, and Chu (2002), and Im, Pesaran, and Shin (2003) which is referred as IPS. The second group includes unit-root tests developed by Phillips and Sul (2003), Bai and Ng (2004), and Pesaran (2007), among others.

Since the assumption of there is no problem of cross-sectional dependence is rejected for all the variables in this study (Table 4), second-generation unit-root tests will be implemented. These tests provide more robust results by taking into account the fact that the variables can be

represented by a common factor for unaccounted processes (Pesaran, 2007). Among the second-generation unit-root tests, this study uses the cross-sectionally augmented IPS test (CIPS) unit root test suggested by Pesaran (2007). To carry out a panel unit-root test with cross-sectional dependence, Pesaran (2007) considers a statistic which is constructed from the following cross-sectionally augmented Dickey-Fuller (CADF) regression and estimated using the OLS method for the ith cross-section in the panel:

$$\Delta y_{it} = \alpha_i + \rho_t y_{i,t-1} + c_i \bar{y}_{t-1} + \sum_{j=0}^{k} d_{ij} \bar{y}_{t-j} + \sum_{j=0}^{k} \delta_{tj} \bar{y}_{i,t-j} + \varepsilon_{it} \tag{14}$$

where $\bar{y}_{t-1} = \frac{1}{N}\sum_{i=1}^{N} y_{i,t-1}$. The CIPS test statistic that is based on the average of individual CADF statistics is given as:

$$CIPS = \frac{1}{N}\sum_{i=1}^{N} t_i (N,T) \tag{15}$$

where $t_i(N,T)$ is the t-statistic for the ρ_t estimate in the above equation (see Pesaran, 2007).

The CIPS test statistic is used to test the null of $H_0: \rho_t = 0$ for all i (a unit-root process for all time series in the panel) against the alternative $H_0: \rho_t < 0$, for at least some i (a stationary process for at least one of the time series).

Given the appearance of cross-sectional dependence for most of the variables under consideration, CIPS tests are used to test the order of integration in the variables. According to results of these tests, presented in Table 5, all of the variables appear to be non-stationary in levels and hence have a unit root, and more specifically, all of the variables are found to be I(1). The next section proceeds by testing whether these variables follow a linearly-connected path in the long-run, in other words, whether they are cointegrated.

Table 5: Second-generation Panel Unit Root Tests: CIPS

Variable	Investment-driven		Factor-driven		Fragile	
	Level	First Difference	level	First Difference	level	First Difference
ln real GDP	-0.10	-2.87	-0.69	-4.60	-1.11	-3.56
	(0.46)	(0.00)	(0.25)	(0.00)	(0.12)	(0.00)
ln human capital	-1.19	-6.22	-0.96	-4.08	0.65	-5.05
	(0.12)	(0.00	(0.17)	(0.00)	(0.74)	(0.00)
ln labor force	-1.09	-7.32	-0.10	-2.51	-1.21	-2.99
	(0.14)	(0.00)	(0.46)	(0.01)	(0.11)	(0.00)
ln domestic capital stock	-0.96	-3.51	-0.89	-4.38	0.62	-4.38
	(0.17)	(0.00)	(0.19)	(0.00)	(0.73)	(0.00)
ln FDI stock	0.15	-4.11	1.56	-4.08	1.26	-10.18
	(0.56)	(0.00)	(0.94)	(0.00)	(0.89)	(0.00)
trade openness	-0.97	-4.54	-0.93	-3.29	-1.06	-1.06
	(0.16)	(0.00)	(0.18)	(0.00)	(0.14)	(0.14)
ln M2 to GDP	0.36	-5.77	0.09	-4.16	0.66	-4.33
	(0.34)	(0.00)	(0.16)	(0.00)	(0.75)	(0.00)
ln commodity Price	0.03	-4.06	1.58	-2.99	0.64	-2.77
	(0.59)	(0.00)	(0.93)	(0.00)	(0.73)	(0.00)
POLINS	1.576	-2.82	1.35	-2.34	2.64	-2.62
	(0.94)	(0.00)	(0.92)	(0.01)	(0.93)	(0.01)
*ln human capital*ln FDI stock*	0.04	-5.86	1.58	-2.79	0.65	-2.87
	(0.52)	(0.00)	(0.94)	(0.00)	(0.74)	(0.00)
POLINS ln FDI stock*	-0.86	-3.21	-0.66	-3.91	-0.40	-4.01
	(0.17)	(0.00)	(0.33)	(0.00)	(0.35)	(0.00)

Note: The CIPS test assumes cross-sectional dependence based on there being one unobserved common factor. *P*-values are shown in parenthesis. A prefix *ln* indicates the natural log transformation of that variable. For the empirical analysis there are 11 countries classified economically investment-driven, 23 countries as factor-driven and 12 countries as fragile.

5.3 Panel Cointegration Test

After determining the integration level of the data, we can apply cointegration tests to explore whether there exists a long-run relationship among the variables. Similar to the first-generation unit-root tests, the first-generation panel cointegration tests may not be able to reject the null hypothesis as a result of omitting possible structural breaks and cross-sectional dependence (Westerlund, 2007).

The empirical work in the current study relies on the cointegration test developed by Westerlund (2007) which is valid even when there is a problem of cross-sectional dependence. Westerlund (2007) proposed four cointegration tests based on structural rather than residual dynamics (Everaert and De Groote, 2016).

For instance, assume that the data generating process has the form (Westerlund, 2007):

$$\Delta y_{it} = \delta_i' d_t + \alpha_i \left(y_{i,t-1} - \beta_i' x_{i,t-1} \right) + \sum_{j=1}^{p_i} \alpha_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{p_i} \gamma_{ij} \Delta x_{i,t-j} + e_{it} \qquad (16)$$

where $t = 1, \ldots, T$ and $i = 1, \ldots, N$ are the time-series and cross-sectional units, respectively, and d_t represents the deterministic components. For simplicity, it is assumed that the K-dimensional vector x_{it} is a pure random walk, and that these errors are independent across both i and t. Westerlund (2007) handles any dependence across any cross-sections using bootstrapping techniques.

The parameter α_i measures the speed of adjustment (Westerlund, 2007). The parameter α_i is required to be negative for there to be a cointegration relationship among the variables. If the parameter α_i is equal to zero there is no cointegration (Westerlund, 2007).

Westerlund (2007) tests for cointegration using the null hypothesis of no cointegration and an alternative hypothesis that depends on the assumption about the homogeneity of α_i. Westerlund (2007) tests are based on the significance of the error correction term (α_i). According to the alternative hypothesis one can distinguish between group-mean tests and panel tests.

The group-mean tests can be calculated by

$$G_T = \frac{1}{N} \sum_{i=1}^{N} \frac{\hat{\alpha}_i}{SE(\hat{\alpha}_i)} \qquad (17)$$

$$G_a = \frac{1}{N} \sum_{i=1}^{N} \frac{T\hat{\alpha}_i}{\hat{\alpha}_i} \qquad (18)$$

and the panel statistics are given by

$$P_T = \frac{\hat{\alpha}_i}{SE(\hat{\alpha}_i)} \qquad (19)$$

$$P_a = T\hat{\alpha} \qquad (20)$$

The P_t and P_a tests are designed to test the alternative hypothesis that the panel is cointegrated, whereas the two other tests, based on G_t and G_a, test whether at least one element in the panel is cointegrated (see Westerlund, 2007).[17] All of these tests are constructed under the null hypothesis that coefficient for the error-correction term– i.e. no cointegration (Westerlund, 2007).

For the current study, the Westerlund (2007) cointegration tests are undertaken on two separate models, for each country grouping. For the first model, Model 1, the growth model is based on the macro fundamentals and the aggregate political and institutional (POLINS) variables. In this

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[17] These four test statistics are normally distributed. The two tests (G_T, P_T) are computed with the standard errors estimated in a standard way, while the other statistics (G_a, P_A) are based on Newey and West (1994) standard errors.

model the potentially cointegrating vector contains log real GDP and the following variables: log of real domestic capital stock, log of labor force, log of human capital stock, log real FDI stock, trade openness, log of the M2 to GDP ratio, POLINS, and log of the commodity price index (the log used is the natural log throughout). The other model, Model 2, incorporates two interaction terms, log human capital*log real FDI stocks and POLINS*log real FDI stocks, as additional variables to Model 1. The results of these tests are given in Table 6. Overall, the existence of a long-run relationship among these variables is inferred, since the null hypothesis of no cointegration is typically rejected (there is always rejection of the null hypothesis with the P_t and P_a tests, and in most of the model-type and country-type combinations shown in Table 6 there is rejection of the null hypothesis with the G_a test).

Table 6: Westerlund (2007) Cointegration Test

Model	Statistic	Investment-driven		Factor-Driven		Fragile	
		P-value	Robust P-value	P-value	Robust P-value	P-value	Robust P-value
Model 1	Gt	0.031	0.112	0.009	0.152	0.252	0.209
(No Interaction	Ga	0.916	0.035	0.263	0.039	0.781	0.039
Terms)	Pt	0.014	0.010	0.003	0.001	0.021	0.010
	Pa	0.080	0.032	0.022	0.000	0.019	0.042
Model 2	Gt	0.201	0.151	0.421	0.569	0.775	0.598
(With	Ga	0.369	0.051	0.503	0.033	0.890	0.100
Interaction	Pt	0.010	0.008	0.012	0.041	0.009	0.051
Terms)	Pa	0.041	0.010	0.002	0.000	0.024	0.002

Note: Results for the null hypothesis of no cointegration. Intercept and trend is included as a deterministic component in the test Eq. 16. The potentially cointegrating vector in Model 1 contains log real GDP and the following variables: log of real domestic capital stock, log of labor force, log of human capital stock, log real FDI stock, trade openness, log of the M2 to GDP ratio, log of the commodity price index, and POLINS. The other model, Model 2, incorporates two interaction terms (log human capital*log real FDI stocks and POLINS*log real FDI stocks) as additional variables to Model 1. For the empirical analysis there are 11 countries classified economically as investment-driven, 23 countries as factor-driven and 12 countries as fragile. Inadition,

5.4 The Short-Run and Long-Run Results

This section empirically investigates the channels through which FDI impacts economic growth in fragile, investment-driven, and factor-driven African economies. Thus, in addition to the direct effects of FDI on growth, it examines whether FDI interacts with the stock of human capital and also with an aggregate measure for the political and institutional indicator variable to affect economic growth in a meaningful way. The results from estimated error-correction models associated with the two models considered in Table 6 are shown in Table 7.[18]

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[18]The models are first estimated using the traditional panel cointegration approach. Then residual-based post-estimation Pesaran (2004) CD-test is undertaken. The test indicated the presence of cross-section dependence problem in the residuals. Thus, to account for the cross-section dependence, the models are re-estimated using the dynamic common correlated effects methodology of Chudik and Pesaran (2015b).

Table 7: Estimation Results for Model 1 and Model 2[a]

Short-run Estimates: Mean Group Estimates:	Model 1			Model 2		
	Investment-driven	Factor-driven	Fragile	Investment-driven	Factor-driven	Fragile
	$(N, T) = (11,27)$	$(N, T) = (23,27)$	$(N, T) = (12,27)$	$(N, T) = (11,27)$	$(N, T) = (23,27)$	$(N, T) = (12,27)$
Δ ln real GDP , 1-period lagged	0.130	0.102	0.097	0.102	0.101	0.108
Δ ln human capital	0.051	0.010	-0.023	0.034	0.014	-0.197
Δ ln FDI stock	0.097**	0.079	-0.047	0.099**	0.082	-0.048
Δ ln labor force	0.331***	0.539***	0.632***	0.340***	0.542***	0.611***
Δ ln domestic capital stock	0.223***	0.189***	0.169***	0.218***	0.178***	0.153***
Δ ln M2-to-GDP ratio	0.061	0.010	-0.021	0.059	0.019	-0.033
Δ trade openness	0. 018**	0.014**	0.006*	0.018**	0.014**	0.013**
Δ ln commodity price	0.121***	0.149***	0.173***	0.129***	0.131***	0.170***
Δ POLINS	0.681*	0.739*	0.549*	0.640**	0.701***	0.098**
Δ ln human capital $\times$ Δ ln FDI stock				0.013	0.010	-0.009
Δ POLINS $\times$ Δ ln FDI stock				0.010**	0.008	-0.003
Constant	-19.31***	-29.06***	-33.04***	-18.00***	-26.08***	-27.55**
Long-run Estimates: Pooled Variables						
adjustment Coefficient	-0.610***	-0.509***	-0.309***	-0.619***	-0.510***	-0.290***
ln human capital	0.046*	0.022	0.009	0.043	0.020	0.005
ln FDI stock	0.065**	0.008**	0.020	0.078**	0.010**	0.021
ln labor force	0.320***	0.350***	0.451***	0.330***	0.340***	0.421***
ln domestic capital stock	0.210***	0.190***	0.12***	0.231***	0.181***	0.140***
ln M2-to-GDP ratio	0.006	0.009	-0.001	0.078	0.010	-0.050
trade openness	0.021**	0.012**	0.010**	0.024**	0.014**	0.013**
ln commodity price	0.070***	0.130***	0.120***	0.110***	0.130***	0.120***
POLINS	0.321**	0.424**	0.440**	0.474**	0.571**	0.344**
ln human capital $\times$ ln FDI stock				0.011**	0.008	0.072
POLINS $\times$ ln FDI stock				0.081**	0.012*	0.010
F-Statistic : P- Value	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R-squared	0.966	0.962	0.943	0.970	0.969	0.951
Jarque –Berra: P-value	0.531	0.493	0.272	0.504	0.470	0.293
CD_p Statistic: P-value	0.553	0.360	0.210	0.581	0.320	0.260

Note: ***, **, and * represent significance at 1, 5, and 10 percent level of significance. [a] Model 1 includes all the macro fundamentals and POLINS variables. Mode 2 includes two interaction terms (the interaction terms between human capital and FDI and POLINS and FDI) as additional variables on Model 1. Δ indicates the change of the variable under consideration, N represents the number of countries, and T is the number of years. 'xtdcce2' add-on STATA module is used to generate the results in Table 7.

Domestic capital stock, labor force, and human capital

The effect of domestic capital stock on output is found to be significant and positive in both models for all country groups, both in the long-run and short-run. However, the magnitude of the effect varies across the country groups. The long-run effect is stronger in investment-driven economies than in the other categories. This may relate to the relatively better domestic physical capital accumulation found in investment-driven economies (see World Bank, 2013, 2017). A similar finding is reported in other growth-related studies (see, e.g., De Mello, 1997; Borsworth et al., 1999; Akinlo, 2004). Similarly, the effect of labor force on output is found to be significant and positive in both models for all country groups, both in the long-run and short-run. However, the effect of human capital on output is found to be significant in only in some cases for investment-driven economies, as can be seen with the long-run coefficient on the log of human capital in Model 1 and the long-run coefficient on the interactive term between human capital and stock of FDI (log human capital*log FDI stock) in Model 2. The large body of literature on growth has mostly found some measure of human capital as a significant determinant of growth (see, e.g., Barro, 1991). However, some other authors have argued that factor accumulation is not the key to growth in African economies (see, e.g., Bils and Klenov, 2000; and Easterly and Levine, 1997).

FDI

The effect of increased FDI on growth, however, is found to be mixed. It varies across the country groups and time horizons considered. For instance, a significant positive effect of FDI on output is found in investment-driven economies both in the short-run and the long-run.[19] Several studies have reported a similar result for other countries/groups of countries (see, e.g., Blomström et al., 1996; Basu et al., 2003; Zghidi et al., 2016). However, in factor-driven economies, the positive effect of FDI on output is found only in the long-run. Its effect in the short-run is statistically insignificant (albeit positive). In addition, the long-run impact of FDI on output is relatively stronger in investment-driven economies than in factor-driven economies. The results regarding the investment-driven economies can be taken to represent there being stronger effects of FDI in more open and investment friendly countries where the financial system is relatively developed, and economic and political stability is mostly maintained. However, the results also show that the effect of FDI stock on output is found to be smaller than the effects of domestic capital stock.

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[19] Care should be taken in interpreting the overall effect of FDI in Model 2. The overall effect of an increase in FDI (the total effect that comes from the non-interactive term of FDI and the interactive terms) can be calculated by taking the partial derivative of Eq. (9), which is $\frac{\partial logY_{it}}{\partial logFDI_{it}} = d_3 + d_5 logH_{it} + d_{10}POLINS_{it}$. The overall effect of FDI, when the interaction terms are statistically significant, can be calculated by plugging the average value for $logH_{it}$ and $POLINS_{it}$ in $\frac{\partial logY_{it}}{\partial logFDI_{it}}$. In cases where d_5 and d_{10} are statistically insignificant, the overall marginal effect equals d_3 (which is also the marginal effect due to the non-interactive term).

In contrast, the positive effect of FDI on growth noted above vanishes altogether in the case of fragile states. This may be attributed to the inadequate absorptive capability, severe political instability, and weak institutional quality that usually characterize this group of countries. It may also be related to the nature of FDI that is mostly flowing to this group of countries. A similar, insignificant direct effect of FDI on growth has also been reported in earlier studies (see, e.g., Balasubramanyam et al., 1996; Akinlo, 2004). In addition, the negative coefficient in the short-run non-interactive term of FDI (although insignificant) found for the fragile states may relate to the adverse effect of FDI that the dependency school theorist's 'dependence and decapitalization' hypothesis. Most of the major industrial organizations in fragile states are predominantly owned by foreign investors. As the profits of these large monopolies' may be repatriated abroad rather than invested in the FDI host countries, decapitalization might result. In addition, the severe political and socio-economic instability in these countries may lead to capital flight and add to decapitalization, which in turn affects growth negatively. A negative direct effect of FDI on growth is also reported in some of similar earlier studies in Africa (see, e.g., Agbloyor, et al., 2014; Belloumi, 2014).

With regard to the interaction terms, the effect of the interaction term between human capital and FDI on growth is significant (positive) only in the long-run for investment-driven economies. This result is similar with the one reported in, for instance, Borensztein et al. (1998), Li and Liu (2005), and Balasubramanyam et al. (1996). However, it is found to have no such effect in the short-run in the same group of countries. This may be related to the time-evolving nature of human capital formation. The insignificance of this interactive effect in factor-driven and fragile economies, both in the short-run and the long-run, is similar to results reported, for instance, in Carkovic and Levine (2005). This lack of a positive interactive effect of FDI on growth may be due to the low absorptive capability (below the threshold level) of most African countries to make use of the technology, knowledge, and other skills associated with inflows of FDI. Also, it may be related to the nature of most of the FDI flows to the continent, which are mainly concentrated in the extractive sector where the issue of skill development of workers and knowledge transfer is given less importance.

Likewise, the effect of the interaction term between FDI and aggregate political and institutional quality indicator (POLINS) on output is found to be positive and significant in investment-driven economies in the long-run, and it is also found to be positive and weakly significant in factor-driven economies in the long-run. This finding is in line with the view that FDI might have no effect on growth on its own. Rather its effect on growth is conditional upon the quality of other socio-economic and political and institutional factors prevailing in the recipient countries (Borensztein et al., 1998; Akinlo, 2004; Durham, 2004). This interaction effect is statistically insignificant in factor-driven economies in the short-run, however. The effect of such interaction term is totally absent (both in the short-run and the long-run) in fragile African economies (both in the short-run and the long-run).

Trade openness, financial system development, and commodity price

Openness to trade is found to have a significant positive effect on output in all the models. This means that more openness to trade has a positive effect on economic growth. Greater trade openness arguably promotes economic growth in Africa through increasing competitiveness and providing access to international markets, as well as by enabling importation of raw materials and capital goods. In addition, its effect on growth is found to be robust across the various specifications (see Table 7). Similar results have been reported in some of the previous studies (see, e.g., Balasubramanyam et al., 1996). However, the results vary across the country groups. The strongest long-run effect of trade openness on output is found in investment-driven economies, followed by the factor-driven category.

Financial system development, measured by the M2 to GDP ratio, is found to have an insignificant effect on output in all the models, both in the short-run and in the long-run. However, its short-run and long-run coefficients are negative (though statistically insignificant) in fragile economies. This suggests potentially undesirable effects of financial system development in politically fragile and unstable countries. It could be argued that financial deepening may promote capital flight by easing international capital movements (Akinlo, 2004). This would negatively affect growth (see Geda and Yimer, 2016, 2017). A negative effect of financial development on growth is also reported in some of the earlier studies (see, e.g., Akinlo, 2004).

The effect of the international commodity price level on output is found to be positive and statistically significant in all the models for all the country groups at all times (both in the short-run and the long-run). The strongest effect of the international commodity price (both in the short-run and the long-run) on output is found in factor-driven and fragile economies. This is in line with the fact that these two groups of economies (factor-driven and fragile economies) are predominantly commodity exporters.

Institutions, governance and political stability

Finally, the aggregate measure of the institutional and political quality indicator (POLINS) is found to have a significant positive effect on output both in the short-run and the long-run in all the models for each of the country groupings (weakly significant in the short-run in Model 1). These results are consistent with the hypothesis that the quality of institutions plays a crucial role in enhancing economic growth directly and through FDI inflows. Thus, the results suggest that countries with better political stability and good-quality institutions experience higher economic growth. This finding is consistent with the findings of many other studies (see, e.g., Alfaro et al., 2004; Rodrik et al., 2004).

In summary, growth in Africa seems to be driven by domestic capital stock, openness to trade, labor force, international commodity price, and institutional and political factors. All these factors are found to affect economic output positively in all the models of each of the country groups. However, the sizes of their effects vary across the country groupings and the time horizon considered. On the other hand, the effect of FDI on output is mixed. It varies across the country groups and the time horizon considered. A significantly positive effect of FDI on output is found in investment-driven economies (both in the short-run and long-run) and factor-driven economies (in the long-run). While such effect of FDI is insignificant in factor-driven economies in the short-run, it is totally absent in the fragile category both in the short-run and the long-run. Regarding the interaction terms, the interaction effect of FDI and human capital on output is largely missing in Africa, except in the long-run for investment-driven economies, in which a positive relationship is indicated. On the other hand, the effect of the interaction term between FDI and the aggregate political and institutional indicator (*POLINS*) is found to be positive for investment-driven (significant both in the short-run and long-run) and factor-driven economies (weakly significant in the long-run). This interaction effect is insignificant both in the short-run and the long-run for fragile African states, however.

The speed of adjustment is negative and significant in all the models, indicating any deviation from the long-run growth trajectory tends to vanish, with the system resorting back to equilibrium through time. However, the speed of adjustment varies across the country groupings. Error–correction adjustment is found to be faster in investment-driven and factor-driven countries than in fragile countries. The model specification strategy showed evidence of the importance of introductions of non-linearity, heterogeneity and separation of direct and indirect conditional effects modelling.

5.5 Toda-Yamamoto Approach to Granger-Panel-causality

In order to compliment the cointegration results above, panel causality testing is undertaken using the Toda-Yamamoto approach to panel Granger-causality. This approach is found to be superior to the standard Granger-causality tests. The Toda and Yamamoto (1995) procedure has an advantage in that it does not require precise knowledge of the integration properties of the system. It can be applied even when there is no integration or stability, and when rank conditions are not satisfied so long as the order of integration of the process does not exceed the true lag length of the model (Toda and Yamamoto, 1995; Ziramba, 2009). Toda and Yamamoto (1995) proposed a Granger non-causality test using a modified Wald (MWALD) test. The Toda-Yamamoto procedure is formulated in levels and tests general restrictions on the parameter matrices. The approach involves the determination of a lag length k, and then estimation of a $(k + d_{max})^{th}$-order VAR where d_{max} is the maximal order of integration of the series in the model (Toda and Yamamoto, 1995). This approach can test linear or nonlinear restrictions on the first k coefficient matrices using the standard asymptotic theory (Toda and Yamamoto, 1995). The MWALD statistic has an asymptotic chi-square distribution when VAR $(k + d_{max})$ is

estimated (Toda and Yamamoto, 1995). To undertake Toda and Yamamoto's version of the panel Granger non-causality test, the test equations for the FDI-economic growth relationship can be given as

$$logY_{i,t} = \alpha_0 + \sum_{n=1}^{d_{max}} \alpha_{1n} logL_{i,t-n} + \sum_{n=1}^{d_{max}} \beta_{1n} logK_{i,t-n}^d + \sum_{n=1}^{d_{max}} \gamma_{1n} logFDI_{i,t-n} + \sum_{n=1}^{d_{max}} \delta_{1n} logH_{i,t-n}$$
$$+ \sum_{n=1}^{d_{max}} \theta_{1n} logH * logFDI_{i,t-n} + \sum_{n=1}^{d_{max}} \mu_{1n} OP_{i,t-n} + \sum_{n=1}^{d_{max}} \pi_{1n} logM2GDP_{i,t-n}$$
$$+ \sum_{n=1}^{d_{max}} \rho_{1n} POLINS_{i,t-n} + \sum_{n=1}^{d_{max}} \lambda_{1n} POLINS_{i,t-n} * logFDI_{i,t-n}$$
$$+ \varepsilon_{1i,t} \tag{21}$$

$$logFDI_{i,t} = \sigma_0 + \sum_{n=1}^{d_{max}} \varphi_{1n} logL_{i,t-n} + \sum_{n=1}^{d_{max}} \tau_{1n} logK_{i,t-n}^d + \sum_{n=1}^{d_{max}} \omega_{1n} logY_{i,t-n}$$
$$+ \sum_{n=1}^{d_{max}} \psi_{1n} logH_{i,t-n} \sum_{n=1}^{d_{max}} \phi_{1n} OP_{i,t-n} + \sum_{n=1}^{d_{max}} \upsilon_{1n} logM2GDP_{i,t-n} + \sum_{n=1}^{d_{max}} \zeta_{1n} POLINS_{i,t-n}$$
$$+ \varepsilon_{2i,t} \tag{22}$$

where i is cross-section in the panel, t is time, and $\varepsilon_{1i,t}$ and $\varepsilon_{2i,t}$ are error terms that are assumed to be white noise. In addition, the series are as defined before. In Eq. (21), Granger-causality from FDI to Y implies $\gamma_{1n} \neq 0$ for any $n \in \{1, .. k\}$, and in Eq. (22) Y Granger causes FDI if $\omega_{1n} \neq 0$ for any $n \in \{1, .. k\}$. In Eq. (22), the interaction terms are left out of the test equation as they contain FDI in each of the interaction terms.

In the empirical test, two separate tests of Eq. (21) and Eq. (22) are undertaken for each of the country groups. The results of the Toda and Yamamoto (1995) panel causality test are reported in Table 8. The significance of the p-values of the modified Wald (MWALD) statistic indicates that there is bi-directional causality between FDI and output in investment-driven economies. There is also evidence of unidirectional causality running from FDI to output in factor-driven economies. On the other hand, no causality is detected for fragile African economies in either direction (see Table 8).

Table 8: Results of Toda-Yamamoto Approach to Granger-Panel Causality Test

Test equation includes	Direction of Causality	Investment-driven $(N, T) = (11,27)$		Factor-driven $(N, T) = (23,27)$		Fragile $(N, T) = (12,27)$	
		Test Statistic	Conclusion	Test Statistic	Conclusion	Test Statistic	Conclusion
No Interaction term	$FDI \rightarrow Y$	3.405** (0.041)	Causality run in both direction	6.45** (0.002)	Causality runs from FDI to economic growth	0.004 (0.981)	No Causality in either direction
	$Y \rightarrow FDI$	2.069* (0.076)		2.110 (0.135)		0.515 (0.490)	
Both interaction terms	$FDI \rightarrow Y$	4.061** (0.010)		4.091** (0.041)		0.010 (0.896)	

Note: Results for the null hypothesis (H_0) of no Granger-causality based on estimates of Eqs. (21) and (22). *P*-values are shown in parentheses. *N* and *T* respectively represent the number of countries and number of years, and the symbol $\rightarrow$ shows the direction of causality. ***, **, * denote 1 percent, 5 percent, and 10 percent level of significance, respectively.

6. Conclusion

This study contributes to the FDI literature by investigating the FDI-growth nexus using an analytical classification of African countries into three categories: fragile, factor-driven and investment-driven. Thus, the study is a departure from the approach taken by most FDI-growth relationship studies which pool all different countries in one sample regardless of countries' structural or behavioral differences. In addition, this study takes into account the role of institutional and political factors, which oftentimes are overlooked in previous studies. This will help to reduce the bias in the regression estimates that are caused by omitted variables in previous studies. Furthermore, the study investigate the effects of FDI on economic growth in Africa, including both the direct effects (by increasing the domestic physical capital stock) and the interaction effects (between human capital and FDI and between an aggregate measure of political and institutional indicator and FDI).The issues of cross-sectional dependence and long-run relationships are also accounted for in the empirical estimation of the models.

Panel data on samples of 46 African countries for the period 1990–2016 have been used. The study has applied the dynamic common correlated effects estimation approach for an error correction model derived from an endogenous-growth-model theoretical framework.

In general, the main drivers of economic growth in Africa have been found to be labor force, domestic physical capital, trade openness, international commodity prices, and better political and institutional conditions. However, the sizes of the coefficients vary across the country groups. The results also suggest that there is a variation in the FDI-growth relation across the country groupings.

The long-run effect of FDI (taken as a stock) on output is significantly positive in investment- and factor-driven economies, and its effect is stronger in the investment-driven category. In

addition, the short-run growth effect of FDI stock in factor-driven economies is insignificant, whereas it is positively significant in investment-driven economies. On the other hand, the effect of FDI on output is insignificant, both in the short and long-run, on output in the fragile category. Regarding the interaction terms, the interaction effect of FDI and human capital on output is largely missing in Africa, except in the long-run for investment-driven economies, in which a positive relationship is found. This may be related to the low levels of initial skill and human-capital development that characterizes most African countries. In addition, this may also relate to the nature of most FDI flows to the continent, which typically are directed to the extractive sector where the issue of skill development of workers and knowledge transfer is given less importance. On the other hand, the effect of the interaction term between FDI and the aggregate political and institutional indicator (*POLINS*) is found to be positive for investment-driven economies (significant both in the short-run and long-run) and in factor-driven economies (weakly significant in the long-run). Its effect in fragile African states is, however, insignificant both in the short-run and long-run.

Thus, it can be argued that FDI is not essentially virtuous by its own. Regardless of how globalized a country is, the growth effects of FDI are still dependent on host countries' absorptive capability (initial conditions in terms of human capital and basic physical infrastructure), the type of trade regime it has, the type of FDI it receives, and the quality of institutions and political stability in place, among other things. Hence, FDI might be necessary but it is not sufficient by itself for growth. Some of the policy options and strategic alternatives that African policy makers may consider for promoting the positive effect of FDI flows to the continent and foster growth are listed below.

First, African countries in general need to look carefully and critically at the type of FDI inflows they receive. This relates to the need to increase those FDI flows that create better linkages with the domestic economy at large. Second, African countries need to deepen macroeconomic reforms. This includes, for instance, a careful liberalization of their external trade. Third, emphasis should be placed on developing conducive and well-functioning institutions to support investor-friendly policies. These should include the formulation and implementation of well-functioning legal institutions that support market transactions and protect property rights. Fourth, measures to ensure the political stability in the region must be undertaken. For instance, conflict and instability, often generated because of natural resources, must be addressed to promote the benefits that can be gained from such resources. Finally, investment in the development of basic and productive infrastructures should be encouraged. The findings on how increasing human capital is associated with growth point to the need for Africa in general to pursue educational policies that harness the stock of such capital.

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Appendix

Table A1: Some Selected Studies on the FDI-Growth Nexus in Developing Countries

Effects on Economic Growth	Study	Coverage	Methodology	Remark
Positive	De Gregorio (1992)	12Latin America Countries 1950- 85	Panel GLS	FDI has a positive effect on growth
	Blomström et al. (1996)	78 developing countries 1960- 85	Cross country Regression	FDI has a positive effect on growth
	Balasubramanyam et al. (1996)	46 developing countries 1970- 85	Cross country Regression	FDI has a positive effect on growth for the overall sample. The effect is stronger in more open economies.
	Borenztein et al. (1998)	69 developing countries 1970- 89	Cross country Regression	FDI has a positive effect on growth if there exists a certain minimum threshold level of human capital stock
	Bende-Nabende et al. (2003)	5 Asia Pacific Region: Indonesia, Malaysia, Philippines, Singapore and Thailand 1970-94	Time Series analysis	FDI has positive effect on growth for Indonesia, Malaysia and, Philippines.
	Ramírez (2000)	Mexico 1960–95	Time series Cointegration	FDI has a positive effect on growth both in the short and the long-run.
	Bende-Nabende et al. (2002)	5 East Asian countries: Hong Kong, Japan, the Philippines, Taiwan and Thailand) (1965-99)	Time series and Panel Cointegrartion	The effect of FDI on growth is mixed. Positive effect of FDI on growth for Philippines and Thailand.
	Basu et al. (2003)	23 developing countries (1978–96)	Panel Cointegration	FDI has a Positive effect on growth but depends on trade openness
	Hansen and Rand (2006)	31 developing countries 1970- 00	Panel GMM	FDI has a positive effect on GDP.
	De Mello (1999)	32 countries (15 OECD and 17 non-OECD)	Both time series s and panel data	The effect of FDI on growth is not strong: Weakly Positive for OECD and

Weakly Positive /Negative		(1970- 90)	techniques	weakly negative effect for non-OECD
	Bende-Nabende et al. (2002)	East Asian countries (Hong Kong, Japan, the Philippines, Taiwan and Thailand) (1965-99)	Panel VECM	Negative for Japan (insignificant)
No effect	Bende-Nabende et al. (2002)	East Asian countries (Hong Kong, Japan, the Philippines, Taiwan and Thailand) (1965-99)	Time series and Panel Cointegration	There is no long-run relationship between FDI and GDP for Hong Kong
	Carkovic and Levine, 2005	For a sample of 68 countries, (1960-95)	Panel GMM	FDI does not exert a robust, positive impact on economic growth
	Herzer et al. (2008)	28 developing countries	Cointegration techniques on a country-by-country basis.	There is not a single country where a positive unidirectional long-term effect from FDI to GDP is found
Negative	Saltz (1992)	75 developing countries (1970- 80)	Cross country regression	Negative correlation between the level of FDI and growth.
	Bende-Nabende et al. (2003)	5 Asia Pacific Region: Indonesia, Malaysia, Philippines, Singapore and Thailand 1970-94	Time series cointegration	FDI has negative effect on growth for Singapore and Thailand
	Bende-Nabende et al. (2002)	East Asian countries (Hong Kong, Japan, the Philippines, Taiwan and Thailand) (1965-99)	Panel VECM	The effect of FDI on growth is mixed. Negative in Japan (insignificant) and Taiwan.

Table A2: Final Country Classification Used in the Study

Investment-Driven African Economies	Factor-Driven African Economies		Fragile State African Economies	
Algeria	Angola	Niger	Burundi**	Liberia
Egypt	Benin	Rwanda	Central African Republic	Libya**
Tunisia	Burkina Faso	Seychelles	Chad	Sao Tome and Principe**
Morocco	Cameroon	Tanzania	Comoros	Sierra Leone
Botswana	Equatorial Guinea	Uganda	Congo, Dem Rep	Somalia**
Kenya	Ethiopia	Gabon	Congo, Rep	Sudan
Mauritius	Gambia	Ghana	Cote d'Ivoire	Togo
Malawi	Lesotho	Mali	Djibouti**	Zimbabwe**
Namibia	Madagascar	Nigeria	Eritrea**	
South Africa	Mauritania	Senegal	Guinea	
Cape Verde	Mozambique	Swaziland**	Guinea-Bissau	
	Niger	Zambia		

Note: No African economy has reached the Innovation Driven stage (Advanced African), yet (except to some degree South Africa followed by Egypt and Algeria). Countries indicated by '**' are not included in the various pre-eastimation test (such as, excluded from the cross-sectional dependence test, unit-root test, and cointegration test), and the model eastimated in this study due to of inavilabilty of data for the all the variables considered in this study.

The country classification outlined in Geda and Yimer (2018) identify the following four categories for Africa countries:

i) **Factor-Driven African Economies (Aspiring African Economies: Class A and B)**: These are African economies whose source of competitive advantage in the global economy comes from basic factors such as labour and other natural resources. Here, technology is pretty much standard and at best imitated and competition by countries in this stage is sustained through price. The peculiar feature of countries in this stage is the sensitivity of such economies to world economic cycles, exchange rate and interest rate movement and its effect on commodity speculators as well as the loss of factor advantage. This stage is relevant for most of African countries.

ii) **Investment-Driven African Economies (Emerging African Economies)**: These are African economies with the ability and willingness to absorb and modify the best available technology through large investment and that have made themselves competitive in the global economy. Like that of the factor-driven stage the competitiveness in this stage comes from standardized and price sensitive commodities.

iii) **Innovation-Driven African Economies (Advanced/Frontier African Economies)**: These are African economies which have created unique value by their firms and cluster of firms that gives them an edge over competitors in the global market. They are also at the world technology frontier regarding the goods they supply to both large domestic markets and the global economy.

iv) **Fragile African Economies**: These are African economies characterized by an incapacitating combination of weak governance, policies and institutions, indicated by ranking among the lowest (< 3) on the country policies and institutional performance assessment (CPIA) index of the World Bank. These are states that have failed to provide comprehensive service entitlements to their citizens, and lack authority and legitimacy, owing to failure of either, capacity or, political will or both. One distinguishing characteristic is that there is a high(er) risk of reverting back into conflict (see Geda and Yimer, 2018 for the detail).

Table A3: Correlation Matrix of the Political and Institutional Indicators
(Sample: 1990 2016)

	Investment-driven (N=11)		
	Political Stability	Rule of Law	Regulatory Quality
Political Stability	1.00		
Rule of Law	0.80	1.00	
Regulatory Quality	0.70	0.79	1.00
	Factor-driven (N=23)		
	Political Stability	Rule of Law	Regulatory Quality
Political Stability	1.00		
Rule of Law	0.71	1.00	
Regulatory Quality	0.65	0.75	1.00
	Fragile (N=12)		
	Political Stability	Rule of Law	Regulatory Quality
Political Stability	1.00		
Rule of Law	0.72	1.00	
Regulatory Quality	0.68	0.76	1.00

Note: N indicates the number of countries

Declaration

I, Addis Yimer, hereby declare to the School of Graduate Studies of Addis Ababa University, College of Business and Economics, Department of Economics that, this dissertation entitled "Four Essays on International Finance and Economic Growth in Africa" is a product of my original research work. It was not submitted, in full or part, for the attainment of any academic degree elsewhere. To the best of my knowledge, I have fully acknowledged the materials and pieces of information used in the study. The reporting procedures do comply with the expected standards and regulation of the University.

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