THE EFFECT OF CORRUPTION ON BILATERAL FOREIGN DIRECT INVESTMENT IN AFRICA

Ayotunde Akinsola

Date: 23rd may 2016

Master Thesis

Written under the supervision of Caroline Witte & Dr. Stavropoulos

Erasmus School of Economics

Master: Economics and Business Economics

ABSTRACT

This research empirically analyses the effect of corruption on both inward and outward foreign direct investment in African economies. Data from the FDI markets database, CEPII gravity database and the World Bank database are combined resulting in a sample of about 225 countries. The random effect model is estimated to analyse how corruption plays a role in either deterring or attracting foreign direct investment. I argue that corruption has a negative effect on FDI and that the type of corruption is important in measuring the influence of corruption in Africa. The results show that a low level of corruption promotes outward FDI from African countries.

Table of Contents

1.   INTRODUCTION

In 2014, foreign direct investment (FDI) into African economies increased by 64 percent valued at 87 billion dollars, and this accounted for 13 percent of global FDI (African Investment report, 2015). The increase in FDI to African economies has transformed this region to the world's fastest-growing region for investment (FDI intelligence report, 2015).

Figure 1 Table showing increase in inward FDI into African & Transition economies 1990 - 2015
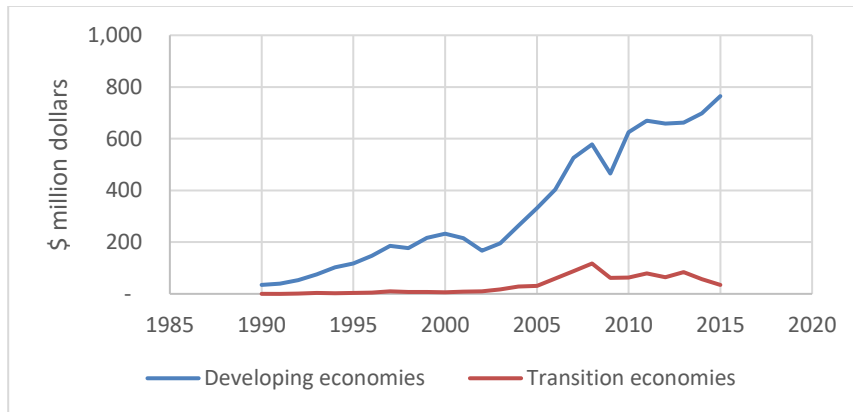
Source: United Nations, World Investment Report, 2016

Likewise, the share of developing and transition economies in global FDI outflows has been increasing steadily over the decade and peaked at 31.8 percent in 2010 (World Investment Report, 2012). A growing number of Multinational Enterprises (MNEs) from developing and transition economies are increasingly undertaking cross-border investment activities through FDI (Al-sadiq, 2013). But despite the increase of both inward & outward African FDI, majority of Africans are yet to reap the benefit of FDI.
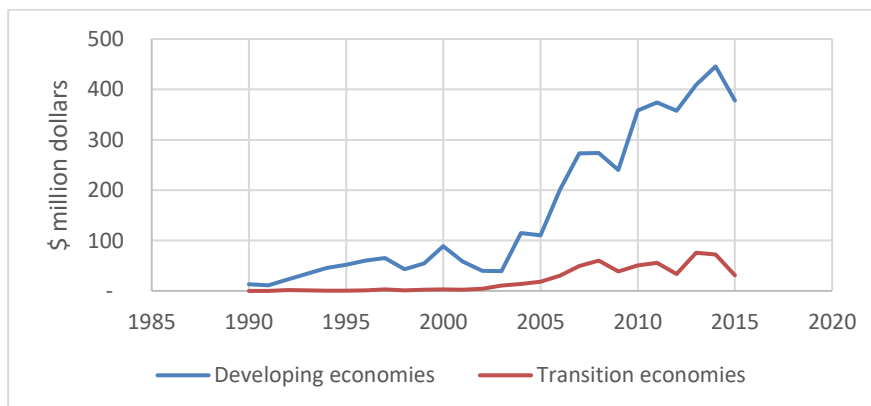
Figure 2 Table showing increase in outward FDI from African & Transition economies 1990 - 2015

Source: United Nations, World Investment Report, 2016

Corruption has been identified as one of the reasons why countries in transition have refused to develop. It strikes at the heart of the market economy, distorting decision making and rewarding the corrupt and manipulative, rather than the efficient and the productive (Transparency International, 2000). Moreover, some countries such as China, Brazil and Nigeria are recipients of huge amounts of FDI inflows despite their perceived high level of corruption. In other words, corruption does not keep FDI out of countries. This premise begs the question of just how corruption affects FDI. Yet, few empirical studies have investigated how corruption affects FDI in African economies. This study seeks to ascertain to what extent corruption affects FDI in transition economies, especially countries in the African continent.

The Oxford English Dictionary (2016) defines corruption as perversion or destruction of integrity in the discharge of public duties by bribery or favour. Here, corruption affects the decision making of government bureaucrats which is as a result of bribes and kickbacks they receive in exchange for carrying out a particular duty. Further, The World Bank (1997) defines corruption as the abuse of public power for private gain. Within this context, the misuse of public resources for private benefits serves as a classic example of principal-agent problem (Gyimah-Brempong, 2002); where the principal is the general public and the government officials are the agents. It occurs because the principal (general public) and agents (government bureaucrats) have differing goals and desire and it is difficult for the principal to observe or monitor the agent's behaviour (corrupt) (Tate et at., 2010).

Corruption is widespread around the world. It is believed to be endemic and pervasive, a significant contributor to low economic growth, to stifle investment, to inhibit the provision of public services and also increases inequality (Bolgorian, 2011). It is an activity that can take place in different forms such as when police officers ask for bribes to perform routine services (World Bank, 2016), or it could be a clandestine activity which takes place away from the glaring eyes of the public (Blackburn et al., 2010). In developing countries, it is seen as one of the causes of low income and is believed to play a critical role in generating poverty traps (Aidt, 2009). Cuervo-Cazurra (2006) examined the effect of corruption on FDI in the Organisation for Economic Cooperation and Development (OECD) region. The countries listed in the OECD are majorly developed countries. The results show that due to the laws against bribing abroad for companies in the OECD region, it acts as a deterrent against engaging in corruption in foreign countries.

From an empirical view, the literature on the effects of host country's corruption level on FDI inflows has produced mixed results. Springis (2012) studied the FDI inflows into 179 economies during the period 2004 to 2009, the results show that corruption has a negative impact on inward FDI. Subasat & Bellos (2013) assessed the impact of corruption on FDI in Latin American countries, they find out that high levels of corruption are associated with high levels of FDI. In other words, corruption has a positive influence on the level of FDI. Brada et al. (2012) compared the effect of corruption on FDI in both home-country and host-country. The results show that if FDI is undertaken to a host country, the volume of FDI is affected by home-country but not by host-country. They conclude that corrupt host countries are less are less likely to undertake FDI.

Therefore, this research seeks to analyze the conceptual and empirical links between corruption and FDI with a major focus on Africa economies. Hence, the main research question of this study is: How does corruption affect the level of FDI in African countries? Further, this question is split further into two sub-questions: What are the effects of FDI on corruption in African economies? How does the level of corruption in African countries affect FDI?

The findings of this study will be beneficial to the society at large by highlighting the effect of corruption on investment into African economies. This is because the level of corruption in a host country plays an important role in either attracting or deterring foreign investors. More so, as foreign investments into African economies have increased over the decade, it is important to understand the pernicious role of corruption and how it affects investment decisions. Thus, this research will serve as a guide to government institutions and will also help African policy makers in making sound policies that will attract investments. Lastly, this study will add to the growing literature on the effect of corruption on FDI in Africa.

The remainder of this thesis is organized as follows. In the next section, a literature review will be provided, where various theories and empirical studies will be analyzed critically. Also, the hypothesis for this research will presented in this section. Section 3 presents a conceptual framework and discusses how the variables are linked and why they are used in this research. In section 4, the data and methodology used in carrying out this research will be explained. The results are presented and discussed extensively in section 5. Finally, in section 6, the results will be summarized briefly and put into perspective; and in addition, limitations and policy implications will be included as well as suggestion for future research.

2. THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

In this section, different Foreign Direct Investment theories are explained first, followed by a look at previous empirical studies on corruption; Thereafter, the link between corruption and FDI, and the two different views on corruption is discussed at length. Afterwards, previous research on corruption and FDI in Africa is given special attention and finally, the two hypothesis is presented.

2.1 An Overview of Foreign Direct Investment

According to the Organisation for Economic Cooperation and Development (OECD) fact book (2013), FDI is defined as cross-border investment by a resident entity into one economy with the objective of obtaining a lasting interest in an enterprise resident in another country. Here, the flow of income originates from a home country and its destination is to a host country in order to promote a long term relationship between the investor and investee.

Foreign direct investment (FDI) has assumed increasing importance over time, becoming a prime concern for policy makers and a trendy debateable topic for economists (Moosa & Cardak, 2006). It not only raises the level of investment or capital stock but increases employment by creating new production capacity and jobs; transfer intangible assets such as technology and managerial skills to the host country and provide a source of new technologies, processes, products, organizational technologies and management skills, backward and forward linkages with the rest of the economy (Ho & Rashid, 2011).

The relationship between foreign direct investment (FDI) and economic growth has been a topic of debate for a long time. Ray (2012) analysed the causal relationship between FDI and economic growth in India for the period 1990 to 2011 using a co-integration analysis; the results confirm a positive and long-run relationship between FDI and growth. Freckleton & Craigwell (2012) examined the effect of corruption and FDI on economic growth in a group of 42 developing and a set of 28 developed countries using panel dynamic ordinary least squares. Their results suggest that FDI has a significant effect on economic growth both in the long and short run for both types of nations.

Branstetter (2006) using a Japanese firm-level panel data, developed a framework to examine if FDI serves as a channel of knowledge spillover. The results show that FDI increases the flow of knowledge spillovers from and to the investing Japanese firms. Likewise, Xu & Sheng (2012)

studied the spillover effects of FDI on domestic firms in the Chinese manufacturing industry between 2000 and 2003, their results confirms a positive spillover from FDI arising from forward linkages where domestic firms purchase high-quality intermediate goods or equipment from foreign firms in the upstream sectors.

Sharifi-Renani & Mirfatah (2012) evaluated the determinants of inward FDI particularly volatility of exchange rate in Iran during the period 1980 to 2006 by using the Johansen and Juselius's co-integration system approach model. The findings of the study reveals that the volatility of exchange rate has a negative relationship with FDI. Also, Abbott et al., (2012) tested the effect of exchange rate regimes on FDI flows to a panel of 70 developing countries for the period 1985 to 2004. They find that developing countries that used the fixed exchange rate system significantly outperformed those that used a flexible exchange rate system in attracting FDI.

Talamo (2007) looked at the determinants of FDI using gravity equation and including institutional variables such as shareholder protection and openness to FDI flows. The results support the hypothesis that corporate governance is an important determinant of FDI flows. Yue & Fan (2014) studied the importance of institutional environment on the location choice of China's outward FDI (OFDI) to 26 main Asian countries during the period 2003 to 2011. Their results suggest three outcomes: (1) Institutional differences between two countries plays a more important role than institution of the host country itself, (2) Chinas OFDI tends to target countries in Asia with poor institution, (3) Resource-seeking FDI has no relation with institution.

Herzer et al., (2014) studied the impact of inward FDI stocks on income inequality among households in Latin American countries using the panel cointegration technique. Their results show no sign of reverse causality and it also confirms a positive and significant effect of FDI on income inequality. Chintrakarn et al., (2012) used a state-level panel data to explore the relationship between inward FDI and income inequality in the United states. They find out that in the long-run, there is a negative relationship between FDI and income inequality in the United States.

2.2 General Theories on Foreign Direct Investment

Most theories on foreign direct investment (FDI) are based on trade theories, and they all attempt to explain why countries trade with one another. The first attempt to explain the reason behind foreign direct investment (FDI) was based on Ricardo's theory of comparative advantage (Denisia, 2010). According to the theory of trade, an economic agent will produce goods and services if they have a lower opportunity cost of producing the same goods and services compared to other economic agents. It is based on the assumption that there are two countries with two products and they trade as a result of differences in the cost of production of goods and services. However, this theory is unsuitable for FDI because it assumes immobility of labour, and it did not take into consideration the introduction of risk and barriers to capital movement and how capital can move freely in any direction (Hosseini, 2005). In contrast, Heckscher (1919) and Ohlin (1933) proposed the Heckscher-Ohlin theorem which states that: "A capital-abundant country will export the capital-intensive good, while the labour-abundant country will export the labour-intensive good." This implies that countries will export goods and services that use its factors abundantly while they import goods and services which its use are relatively scarce. Nonetheless, this theory as well does not take into consideration mobility of factors of production. It does not explicitly answer the question concerning production outside national borders (Nayak & Choudhury, 2014).

A common theme in International Business (IB) research has been examining the effect of national distance on FDI (Bailey & Li, 2015). One of the pioneers in this area of research was Sune Carlson who hypothesized that firms which go abroad suffer from lack of knowledge on how to conduct their business operations in a foreign market (Carlson, 1966). He argues that "once the firm has passed the cultural barriers and had its first experience of foreign operations, it is generally willing to conquer one market after another" (Carlson, 1966, p.15). Carlson's work laid the foundation for the Uppsala internalisation model (Johanson & Vahlne, 1977).

The Uppsala internalisation model is based on the premise that firms invest abroad as a result of gradual learning and the development of market knowledge (Luo & Wang, 2012). Also, when cultural and geographic differences are high, foreign multinational enterprises (MNEs) have a greater difficulty in establishing and maintaining local business relationships (Bailey & Li, 2015). The model is based on three assumptions (Forsgren, 2002):

- Lack of knowledge about foreign markets is a major obstacle to international operations but it can be learned (Johanson & Vahlne, 1977).

- Decisions and implementations concerning foreign investments are made due to uncertainty

- Knowledge is highly dependent on individuals and therefore, it will be difficult to transfer to others.

Buckley and Casson (1976) developed the internalization theory as another explanation of FDI by focusing on the imperfections in the intermediate product market (Rugman, 2014). It was based on the framework developed by Coase (1937). He noted that there were a number of transaction costs to using a market and therefore, a firm will move to produce internally in order to avoid these costs (Nayak & Choudhury, 2014). However, the focus of FDI theory from country-specific determinants to industry-level and firm-level determinants of FDI (Henisz, 2003). They articulated their theory based on three hypotheses (Nayak & Choudhury, 2014):

- Firms maximize profits in a market that is imperfect

- When markets in intermediate products are imperfect, there is an incentive to bypass them by creating internal markets

- Internalization of markets across the world leads to Multinational Enterprises (MNEs)

They also identified five types of market imperfections that result in internalization (Nayak & Choudhury, 2014):

- Co-ordination of resources require a long time lag

- Efficient exploitation of market power requires discriminatory pricing

- Bilateral monopoly produces unstable bargaining solutions

- A buyer cannot estimate the price of the goods on sale

- Government interventions in international markets create an incentive for transfer pricing

However, firms do not always need to invest abroad; internalization occurs only when the benefits from carrying out an MNE activity outweighs the cost of doing same (Casson, 2015). According to Hymer (1976), the nature of the advantages specific to the firm, in the context of market imperfections will determine the extent and the form of international operation.

In his path breaking work, Dunning (1977 & 1979) developed the most robust and comprehensive economic theory of the determinants of FDI in his eclectic or OLI framework (Read, 2008). In the OLI paradigm, he identified three advantages that are prerequisite

conditions necessary for a firm to undertake MNE activity: Ownership advantages (O) are those firm specific advantages, and they can be enjoyed over foreign and domestic competitors; Location advantages (L) play a role in determining which countries MNEs invest in; and Internalization advantage (I) which makes it more profitable for the MNE to carry out transactions within the firm rather than depending on external markets (Nayak & Choudhury, 2014).

In the eclectic theory of FDI presented by Dunning (1981), he argues that there are four motives for investing in a particular host country. Organizations' undertake market-seeking FDI in order to enter an existing market or establish a new market which would improve distribution networks and facilitate export from the host country to other markets. Resource-seeking FDI aims to establish access to basic materials (like raw materials, minerals and agricultural products) and also seeking low-cost or specialized labour in the host country. Efficiency-seeking FDI results as a follow-on on resource or market seeking investments (World Bank Website, 2016). Firms consolidate or integrate their operations (regionally/globally) in order to improve product or process specialization. Strategic asset-seeking FDI aims at the alliances and acquisitions of firms in the host country in order to promote long-term corporate objectives and global competitiveness. Subsequently, Dunning's (1995) argued that due to the increasing porosity of the boundaries of firms, countries and markets, firms need to be progressively more competitive. This emphasis resulted in the advent of "Alliance Capitalism" for theorizing about the determinants of multinational enterprise activity. It focused on an informal structure of authority rather than the hierarchical form of governance structure, therefore building mutual trust between parties engaged in a transaction.

Matthews (2006) proposed a linkage, leverage and learning (LLL) framework to address the emerging multinational enterprises (MNEs), particularly those from the Asia Pacific – dubbed "Dragon Multinationals". He argued that these MNEs from the emerging markets adopt a different internalization approach and that the complementarity of the complex web of globalization, latecomer & newcomer strategy, and innovations is what has given rise to the success of MNEs from the emerging economies. Linkage refers to the emerging MNEs ability to identify and bridge the gaps with the host country; leverage refers to the emerging MNEs ability to take advantage of their unique capabilities which may provide a comparative advantage relative to other global competitors; while learning deals with a MNE going abroad to adopt a new approach which hitherto wasn't known to the firm (Peng, 2012).

Table 1. The multidimensionality of FDI entry strategies and MNE theory summaries

MNE theories/perspective	Major assumptions	Implications of FDI Entry Strategies		
		Location: *where*	Timing: *when*	Investment scale: *how much*
Monopolistic advantage theory; internalization theory	Firms invest abroad if the benefits of exploiting firm-specific advantages outweigh the relative costs of the operations abroad	Countries that have lower adjustment costs (e.g., information costs, currency risk, etc.)	Determined by firms' economies of scale and monopoly advantages	Firms internalize missing or imperfect external markets until the costs of further internalization outweigh the benefits
Representative studies: Aliber 1970; Buckley and Casson 1976; Hennart 2009; Hymer 1976	Firms aspire to develop their own internal markets whenever transactions can be made at lower cost within the firm	Countries with little transaction costs	Determined by the degree and nature of competition at home and abroad	
Uppsala model and related hybrid models	Firms invest abroad based on gradual learning and the development of market knowledge	Started with less psychic distance	Determined by the amount of knowledge the firm possesses, particularly experiential knowledge and the uncertainty regarding the decision to internationalize	A sequential and successive process is followed from no regular export, to export via agents, to establishment of overseas subsidiaries, to overseas production
	The process of internationalization is evolutionary and sequential build-up of foreign commitments over time	Started with networks in which the firm already has positions		
Representative studies: Johanson and Vahlne, 1977; Johanson and Wiedersheim-paul, 1975; Welch and Luostarinen, 1988		Path dependent in location selection		
OLI paradigm; matrix of firm-specific advantages-country-specific advantages (FSA-CSA)	Firms possess ownership, location, and internalization (OLI) advantages that motivate internationalization.	Countries that have location-specific advantages (e.g., natural resources, the quality and size of the labour force, cultural factors, tariff and nontariff barriers, public policies etc.)	When firms' competitive or monopolistic advantages are sufficient to compensate for the costs of setting up and operating a foreign value-adding operation	Dependent on the extent to which firms can utilize their home-specific benefits (e.g., property, technologies, knowledge, managerial or marketing abilities)
Representative studies: Dunning 1980, 1988; Porter, 1990; Rugman, 1981	FSA = O, and CSA = L, I = mechanism of venturing abroad, based on the firm's specific advantages and the host-country specific benefits			Dependent on the marginal internalization costs and benefits
LLL Paradigm	Firms' OFDI focused not only on their own advantages, but on the advantages that can be leveraged and linked externally	Countries that firms can gain resources through linkage with external firms	Accelerated internationalization	Dependent on the extent to which firms need to gain linkage
Representative studies: Matthews, 2002, 2006; Li, 2007	Repeated application of linkage and leverage processes may result in organizational learning	Countries where firms can leverage external linkages and learn	Determined by firms' desire to overcome latecomer disadvantages	Dependent on the supplies of leverage and learning activities
Springboard perspective	Firms use international expansion systematically and recursively as a springboard to compensate for their competitive disadvantages and latecomer disadvantages	Countries that firms can acquire strategic resources	Accelerated internationalization	Relatively in large scales with leapfrog trajectories
		Countries that can reduce their institutional and market constraints at home	Internally propelled by corporate entrepreneurship	
Representative studies: Andreff, 2003; Lecraw, 1993;'Luo and Tung, 2007; Luo and Rui, 2009			Externally boosted by home governmental supports	
		Path departure in location selection		

Source: Luo & Wang (2012)

Luo & Tung (2007) developed another framework to describe the internalisation of emerging market multinational enterprises (EM MNEs). In their research, they presented a springboard perspective where EM MNEs use international expansion as a "springboard" to compensate for their competitive disadvantages and latecomer advantages (Luo & Wang, 2012). The basic idea is that EM MNEs will overcome the latecomer disadvantage in the global market by either buying or acquiring critical assets from MNEs so as to compensate for their competitive weakness. (Luo & Tung, 2007, p.481). Along these lines, scholars have suggested that OFDI from emerging economies may be an effective channel to bridge the technological gap and also to improve advances in manufacturing (Kang & Jiang, 2012)

2.3   What is corruption?

In this research, corruption is defined as the "behaviour by officials in the public sector, whether politicians or civil servants, in which they improperly and unlawfully enrich themselves, or those close to them, by misuse of power entrusted to them" (Transparency International, 2000). Importantly, this definition essentially emphasizes administrative corruption as opposed to strictly political corruption (Voyer et al., 2004). Also, this definition takes note that corruption is a behaviour exhibited by the bureaucrats which has a negative externality to the people who they govern. Paulo (2002) suggests that it's because individuals do not have incentives to fight it even though everybody would be better off without it.

Jain (2001) identified three types of corruption – grand corruption, bureaucratic corruption and legislative corruption. First, grand corruption refers to the actions of those in the higher political class and how they misuse their power to make economic policies. For instance, they can divert public spending to other sectors where they would reap the benefits of corruption. Bureaucratic corruption refers to corrupt actions of appointed bureaucrat, be it in their dealings with their superiors or with the public. Lastly, legislative corruption refers to the manner and the extent to which the voting behaviour of legislators can be influenced. These legislators can be bribed by various interest groups to enact a law that specially favours them regardless of how it benefits the public. In this study, my working definition covers all the three types of corruption.

Corruption is a multidimensional problem (Imam & Jacobs, 2014). Moreover, research on corruption is difficult because many causes of corruption are most likely going to be the consequences of corruption because loops operate that make it hard to isolate the underlying

causes; however, some causal factors can be manipulated to limit the incidence of corruption (Rose-Ackerman, 2007.) In his book, Rose-Ackerman (2007) identifies nine possible causes of corruption: size of public sector, the quality of regulation, the degree of economic competition, the structure of government, the amount of decentralization, the impact of culture, values and gender, and the role of invariant features such as geography and history.

Focusing on theoretical underpinnings, Asongu (2013) identified four main theories of corruption:

- Good and misguided governments formulate systems that are very rigid. Corrupt bureaucrats shape the rules. Corruption diminishes red-tape and if anything improves allocation efficiency (Leff, 1964; Huntington, 1968)

- Good and smart governments plan systems that are supposed to be rigid. Corrupt politicians bend the rules and regulation. Corruption reduces and worsens allocation efficiency (Laffont and Tirole, 1993)

- Greedy and smart governments make rules that are very weak which allows bureaucrats to have more leeway more than they should. There is obvious absence of red-tape and no need for any corruption. Allocation efficiency suffers a great deal (Shleifer and Vishny, 1993)

- Good and smart governments establish rules that make it tempting for the bureaucrat to take money and bend the rules. The politician introduces red-tape in a bid to bend the rules in a way that protects him/her. Corruption and red-tape go hand in glove.

2.4 Link between FDI and Corruption

Over the past three decades, despite a considerable number of theoretical and empirical studies, there is still no agreement on the direction of the impact of corruption on foreign direct investment (FDI) (Barassi & Zhou, 2012). In the academic literature, there exists two major views on corruption: one positive where corruption serves as a "grease in the wheels of commerce" because it can help bypass rigid economic regulations and bureaucratic red-tape (Leff, 1964; Leys, 1965; Huntington, 1968) and on the other hand, one negative because corruption acts as "sand in the wheels of commerce" by increasing the costs of carrying out business operations (Shleifer and Vishny, 1993; Mauro, 1995) therefore having an effect on

economic growth. In the following sub-section, these two views will be discussed extensively and various empirical studies along these lines will be discussed.

2.4.1   Corruption as grease and FDI

The view that corruption can be efficient has long had its theoretical justification in economics. According to this theory, advanced by Leff (1964), Leys (1965) and Huntington (1968); corruption may be beneficial based on the second-best reasoning because it removes every bureaucratic red tape in government that impedes investments and it provides a leeway for investors to bypass inefficient regulations. Here, corruption "greases the wheels of commerce"; it need not necessarily reduce economic performance; rather, it serves as a "helping hand", increasing the profits of foreign firms and contributes to Pareto optimality (Rashid, 1981). In general, corruption facilitates beneficial trades that would otherwise not have taken place (Aidt, 2009)

Although the literature on the "grease effect" of corruption is sparse, a growing number empirical studies have found a positive relationship between corruption and FDI. Levy (2007) renders a first-hand account of how corruption was efficient in The Republic of Georgia during the years 1960-1971. In his study, he offers anecdotal evidence of how rent-seeking behaviour led to the emergence of a well-functioning black market. He concludes that corruption boosted economic growth and increased the standard of living of Georgians.

In their recent work, Dreher & Gassebner (2013), investigated the validity of the 'grease the wheels' hypothesis and how it impacts entrepreneurship by examining 43 highly regulated economies over the period 2003 – 2005. Their result show that public corruption increases private entrepreneurial activity and it also confirms a U-shaped relationship between entrepreneurship and economic development.

Méon & Weill (2010) tested whether corruption may be an efficient grease in the wheels of commerce by studying the interaction between efficiency, corruption and other dimensions of governance for a panel of 69 countries including both developed and developing countries. Their results show that corruption is less detrimental to efficiency in countries that do not have a developed institutional framework; further providing evidence in support of the efficiency of corruption.

Egger & Winner (2005) assessed the relationship between corruption and inward FDI using a sample of 73 developed and less developed countries for a time period 1995-1999; their results provide a positive relationship between corruption and FDI.

To explain the Asian paradox, Vial & Hanoteau (2010) used a panel data of Indonesian manufacturing firms to assess the impact of corruption on productivity growth. Their results show that corruption has a significant effect on individual plant growth.

Michael & Heidi (2004) conducted multiple cross country regressions in attempting to analyse the relationship between corruption and investment. Although their results show that corruption reduces inward FDI into developing countries, their results provide evidence of a "grease effect" in large East Asian industrialized economies. Their results provide evidence of how efficient corruption can be in terms of stable and mutually beneficial exchanges of government privileges for bribes and kickbacks.

2.4.2   Corruption as sand and FDI

The view that corruption acts as a "sand in the wheel of commerce", highlights how corruption creates additional costs and uncertainty for investors, leading to a reduction in FDI (Cuervo-Cazurra, 2006). It emphasizes that some of the cost of corruption may appear or be magnified precisely in a weak institutional context (Meon & Weill, 2010). Gerring and Thacker (2005) test the relationship between regulatory control and political corruption, their results show that low regulatory burdens correlate with lower levels of corruption. Lambsdorff and Cornelius (2000) studied a sample of 26 African countries, their results show that corruption is positively associated with governments that have weak regulations.

There is a large literature on how corruption affects economic growth. Asiedu & Freeman (2009) use firm level data to measure the effect of corruption by regions, their results show that corruption has a negative effect on investment growth for in Transition countries. However, they found no evidence that corruption has a negative effect on investment growth for firms in Sub-Saharan Africa. Anoruo and Braha (2005) use panel data to study the impact of corruption on growth in 18 African countries. Their result show that corruption significantly reduces growth. However, critics have pointed out that since the data on corruption are valid for cross-section analysis but less so for time-series analysis; the result should be viewed with caution.

Alemu (2012) studied the effect of corruption on FDI inflows into 16 Asian economies from 1995 till 2009. The results show that a one percent increase in corruption level triggers about a 9.1 percentage point decrease in FDI inflow. This means corruption reduces the flow of FDI into Asian economies. The author concludes that Asian countries that are characterized by high levels of corruption and also a remarkable flow of FDI inflow can boost their FDI inflows if they reduce their level of corruption.

In a study of Swedish firms, Hakkala et al., (2008) used firm level data to study the impact of corruption on FDI. They find that corruption has different effects on horizontal investments which are investments aimed at sales to local market, compared with vertical markets which are made to access lower factor costs for export sales. They find evidence that corruption is more detrimental to horizontal investments than vertical investments.

Javorcik & Wei (2009) looked at how the volume of FDI and the ownership structure of foreign firms in 22 transition economies, may be affected by the level of corruption. Their results show that although foreign firms would prefer to whole ownership structure in the countries they invest in, but due to a high level of corruption in a host country, investors will choose to have a local partner. That is, corruption not only reduces inward FDI, it also shifts the ownership structure towards joint venture.

Moving on to another study that looks at the cost of corruption from another dimension, Mathur et al., (2013) hypothesize that foreign investors care about economic freedoms rather than political freedoms and this decision affects which country they invest in. They argue that democratic countries may receive less FDI of economic freedoms are not guaranteed and used FDI inflows to 29 emerging economies spanning the period 1980 to 2000. Their results produced two interesting outcomes; First, Corruption Perception (CP) plays a big role in influencing an investor's decision of which host country to invest in. That is, countries which rank low on the index receive low FDI flows relative to those that rank above them. Second, they find that the effect of corruption on FDI in the Asian region is interdependent. For instance, they find that lower perceived corruption in China could influence FDI flows to other economies in the South Asian region.

2.5   Corruption and FDI in Africa

Per the United Nations Economic Commission for Africa (UNECA, 2011), corruption is undoubtedly the most pressing development challenge that confronts Africa, causing debilitating and corrosive effects on the progress, stability and development of the continent. In other words, corruption is seen as a major factor in hindering the growth and development of the African continent. Further, Ban-Ki Moon (2010) stated:

"We all know the heavy toll taken by corruption. More than a trillion dollars stolen or lost, every year -money needed for the Millennium Development Goals."

Although Corruption is a global phenomenon, the impact is felt more in poor and underdeveloped countries, where resources which are meant for development are unduly diverted into private hands (UNECA, 2011). This helps explains why despite increasing FDI inflows into African countries, the results of these investments are lacking. For example, it was estimated in 2004 that about 25% of Africa's GDP is lost to corruption every year (UNECA, 2011).

Furthermore, Kar and Cartwright-Smith (2010) analysed the illicit flows from African countries from 1970 to 2008.They estimated the illicit financial flows from African at about $1.8 trillion dollars which was more than the continent's external debt as at 2008. They conclude that the staggering loss of capital seriously handicaps the continents' efforts to develop. Samura (2009) argues that "the real development priorities of a country are often neglected in favour of those that generate the greatest personal gains for the decision makers." This shows the indirect effect of corruption. It has affected development goals and objectives that would have otherwise prospered the continent. It poses significant economic costs to developing countries, including the subversion of development plans and programmes, and the diversion of resources that may have been invested more efficiently (African Governance Report IV, 2016).

The empirical literature on the effects of corruption on FDI in African countries are lacking. This may be due to the unavailability of data related to the topic of interest or because African economies are becoming attractive destinations for FDI. Guetat (2006) examined the effect of corruption on growth performance in the Middle East and North Africa (MENA) regions. The results confirm an indirect effect of corruption on growth through investment and human capital. Asiedu (2006) finds that African countries with either a large market or natural resource

endowment will attract FDI. The author also finds that countries with good infrastructure and are less corrupt attract FDI.

Hypothesis 1: Corruption is negatively related to inward foreign direct investment (FDI) into African economies.

On the other hand, corruption may not also affect inward investments, it could also deter outward foreign direct investment from African countries. From 1997 to present, 41 countries have signed the OECD Anti-bribery convention. It ensures that parties involved detect, prevent and investigate foreign bribery international business transactions (OECD, 2009). Although most African countries are not signed up to this treaty, African countries that are perceived to be corrupt may have difficulties in investing in countries that have signed up to the OECD African convention. Hence, this forms the argument for my second hypothesis.

Hypothesis 2: Corruption is negatively related to outward foreign direct investment (FDI) from Africa economies

Previous studies have analysed various types of corruption. Rose-Ackerman (1978) highlights the difference between bribing to change existing laws and bribery to prevent the application of existing laws. Shleifer and Vishny (1993) distinguish between corruption without theft and corruption with theft. In the earlier instance, the official provides the government with the price of the good and only takes the additional bribe while in the latter, the official pockets the whole payment made by the firm and remits nothing back to the government coffers. Further, they also categorised corruption into organised corruption where the payment of bribe ensures the prompt delivery of goods, and disorganised corruption, where the payment of bribe doesn't guarantee that the goods would be delivered.

Another classification of corruption is into pervasive and arbitrary corruption. Cuervo-Cazurra (2008) defined pervasive corruption as the known cost of corruption, where an investor expects to be asked for bribes by public employees and politicians to gain government contracts. While arbitrary corruption is the uncertainty associated with corruption where investors do not know if government employees or politicians would ask for a bribe. However, I follow a different direction, instead analysing the impact of high level of corruption on inward direct investment and I also examine if a low level of corruption promotes outward foreign direct investment. Therefore, this leads to my third hypothesis which is split further into two.

Hypothesis 3a: Inward foreign direct investment has a negative relationship with a highly corrupt country in Africa

Hypothesis 3b: Outward foreign direct investment has a positive relationship with a lowly corrupt country in Africa

3.   DATA AND METHODOLOGY

In this section, I will describe the source of the dataset used in this research, explain the variables used in this analysis and finally present a model that will be used to analyse the relationship between corruption and foreign direct investment in African countries (FDI).

3.1.   Dataset

To test the hypothesis in the previous chapter, I use data from different sources. First, FDI markets database is used as the source for the cross-border greenfield investment covering different sectors and countries worldwide. This database was used because it tracks capital investment projects of companies investing overseas during the period 2003 to 2013. A Secondly, I use CEPII database because it produces information on bilateral trade flows and cultural data for 225 countries including: common language, colonial relationship, common currency and language (ethnic and official) among several other indicators.

Also, I use the World Bank database which is a collection of development indicators, compiled from credible recognized international sources. It represents the most current and comprehensive development database online and includes estimates on national, regional and global level. Furthermore, I also use the UNCTAD database which produces more than 150 indicators on international trade, economic trends, foreign direct investment and other economic statistics.

Because of the structure of the hypothesis in this research, I collapsed the FDI markets database into the number of investment and the sum of investment. I chose the sum of investment because I am interested in measuring the effect of corruption on bilateral trade flows in African countries and the number of investments would not be a proper representation of the amount of investments into African countries. Thereafter, I merged the FDI markets database with the CEPII database. Lastly, because I study FDI flows from both home and host country perspective, I separate my control variables according to the source and destination of these investments and merge them with the other database mentioned above.

Table 2 provides a summary of the variables and measures and it provides the source of each of the variables used in this study.

3.2. Dependent variable

The dependent variable in this research is foreign direct investment (FDI), measured in US$ million. FDI is an excellent measure of economic development because, it depends on the extent of profitable investment (Busse et al., 2007). To test how corruption affects FDI, I split

Table 2
Variables, measures and sources of data

	Variable	Measure	Source
Dependent Variables	Ln FDI inflows	Log of FDI inflows into the country in the year in millions of US$	FDI Markets Database (2013)
	Ln FDI outflows	Log of FDI outflows out of the country in the year in millions of US$	FDI Markets Database (2013)
Independent Variables	Control of Corruption (home & host country)	Indicator on the extent to which public power is exercised for private gain, from -2.5(bad) to 2.5(good)	World Bank database
Control Variables	Natural resource (Home country)	Total natural resource (% of GDP)	World Bank database
	Ln Population (Home country)	Natural log of the number of inhabitants	World Bank database
	Inflation (Home country)	Increase in annual consumer price (%)	World Bank database
	Ln GDP (home & host country)	Natural log of gross domestic product in US$	World Bank database
	GNI per capita (home & host country)	Gross national income per capita in US$	World Bank database
	Colonial relationship	Dummy indicator that the home and host country were under a colonial relationship, 1 or 0	CEPII Gravity database
	Ln distance	Natural log of the distance between the home and home country	CEPII Gravity database
	Common Language	Dummy indicator that the home and host country share the same language, 1 or 0	CEPII Gravity database
	Common Border	Dummy indicator that the home and host country have border ties, 1 or 0	CEPII Gravity database
	Common Legal Origin	Dummy indicator that the home and host country share the same origin, 1 or 0	CEPII Gravity database
	Common currency	Dummy indicator that the home and host country share the same currency, 1 or 0	CEPII Gravity database

the FDI variable into two: FDI inflow and FDI outflow. FDI inflow measures investment flowing into a host country while FDI outflow measures outgoing investment from a home country.

Also, I take into consideration that the dependent variable may be skewed and to correct for this, I use the inverse hyperbolic sine transformation: $\log [y_i + (y^2 + 1)^{1/2}]$ (Blattman, 2011). Because using log transformations for investment data creates problems where $\ln (0)$ is undefined, the inverse sine is approximately equal to $\log (2y_i)$ or $\log (2) + \log (y_i)$, and it can be interpreted in the same exact way as a normal logarithmic dependent variable (Woolley, 2011).

3.3. Independent variable

The independent variable of interest in this study is control of corruption. This is an indicator developed by the World Bank and it runs from -2.5 (bad) to 2.5 (good). Per the World Bank, control of corruption captures 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. The higher the coefficient of this variable, the more likely that corruption is low in that country and the lower the coefficient of control of corruption, the more likely than corruption is rampant in each country.

To test hypothesis 1 and 2, I merged control of corruption variable with a unique dataset for specifically African countries. I did this to specifically identify the control of corruption in African countries. Furthermore, to identify FDI to host countries and FDI from home countries, the control of corruption data was merged based on isocodes that represented outward foreign direct investment from home countries and inward foreign direct investment into host countries.

In addition, to answer hypothesis 3a and 3b, I create a threshold to differentiate between low level corruption and high level corruption. A score that is less than 0 represents a highly corrupt country and a score above zero represents a low corrupt country.

3.4   Control Variables

There are several factors that influence the relationship between corruption and FDI in African countries. Therefore, to account for this in this research, I include variables that have a significant effect on the flow of both inward and outward FDI in and out of African countries.

Likewise, as I am studying how corruption affects both inward and outward FDI in and out of African countries, I merged the FDI dataset with another data set containing only countries in Africa. This ensures that the data set focuses on the flow of FDI out of African countries and the flow of FDI into African countries.

In line with Cuervo-Cazurra (2008), I control for 3 different sets of variables: characteristics of the host country, characteristics of the home country, and common characteristics. First, I include the characteristics of the host country because economic and demographic size are an important determinant in attracting FDI since multinational enterprises can benefit from economies of scale (Linneman, 1966). I also take into consideration the average income of the population as this will attract FDI because consumers have the purchasing power (Uhlenbruck et al., 2006). Further, I control for both home and host country inflation rate as this takes into consideration the uncertainty related with high inflation which creates challenges in strategic planning, forecasting of demand and financing operation (Cuervo-Cazurra, 2008). I also consider the amount of natural resource present in the country, as this would attract investors which would ultimately have an impact on FDI.

Second, I control for the characteristics of the home country by taking into consideration the population because large countries are a major source of FDI (Cuervo-Cazurra, 2008). I also include the level of corruption in the home country as this might play a role in influencing investors from the home country (Habib et al., 2002). I also control for the market size of the home country as this has a direct impact on FDI.

Third, I control for the common characteristics between home and host country that could have affect foreign direct investment (FDI). I control for the weighted distance (in km) between the home country and the host country which represents the transportation costs that could either favour or discourage trade (Linneman, 1966). I also include the border ties between the home and host country as this can facilitate movement of goods and services across border and also facilitate FDI. Next, I control for cultural similarities between trading countries by as this would facilitate information across borders and FDI (Johanson & Vahlne, 1977). I also control for colonial relationship that could explain ties between countries. This could facilitate FDI due to historic ties which can boost communication between the home and host country.

Finally, I also include economic freedom which measures how individuals, companies and societies can move goods, services and capital and how government refrains from interfering or completely taking over in economic decisions.

Table 3
Summary Statistics of the controls

Variable	Observation	Mean	Std. Dev.	Minimum	Maximum
Colonial relation	551,936	.0100845	.0999141	0	1
Ln distance	551,936	8.814826	.8135558	-.0048749	9.897904
Common language	551,936	.1743862	.3794415	0	1
Common border	551,936	.0122768	.1101185	0	1
Common legal origin	547,085	.2772896	.4476611	0	1
Common currency	551,936	.0172592	.1302359	0	1
Natural resource	14,164	9.041447	14.32341	0	92.01895
Ln Population	14,162	16.45954	1.515869	12.98285	21.02882
Inflation	14,164	7.413509	205.4445	-35.83668	24411.03
Ln GDP	14,017	25.05915	2.288285	19.32384	30.44592
GNI per capita	14,164	17687.86	17225.86	0	128840

3.5 Methodology

The dataset used in carrying out this research is a panel data set as it contains repeated observations of different indicators across time. The analysis is for a sample of FDI flows in and out of the 54 African countries. There would be no need for a balanced panel as I expect some of the variables to have missing values. Further, as there may be missing values, I do not expect attrition would be a problem because the regressions in this sample are based on unbalanced panel design.

In utilising panel data, the two commonly used techniques in analysis are either fixed effects or random effects estimator. In this research, a fixed effects estimator will not be viable because I would be analysing the effect of corruption on the FDI inflows and outflows across various countries in Africa and because the fixed effects estimator is suitable in measuring the impact of variables that vary over time within countries; I therefore use a random effects estimator.

To test hypothesis 1, I use the following model specification:

$$\text{Ln FDIinflows}_{ij} = \gamma_0 + \gamma_1 \text{ Host country control of corruption}_{ij} + \beta X_{ij} + \varepsilon_i + \mu_{ij}$$

Where γ_1 is the parameters of interest; X_{ij} represents the vector of the control variables; ε_i represents the individual unobserved heterogeneity and μ_{ij} represents the time varying error that

affect the dependent variable Ln FDIinflows$_{ij}$. Hypothesis 1 is supported if γ_1 is negative and statistically significant.

To estimate hypothesis 2, I use the following model specification:

Ln FDIoutflows$_{ij}$ = γ_0 + γ_1 Home country control of corruption$_{ij}$ + βX_{ij} + ε_i + μ_{ij}

Where γ_1 is the parameters of interest; X_{ij} represents the vector of the control variables; ε_i represents the individual unobserved heterogeneity and μ_{ij} represents the time varying error that affect the dependent variable Ln FDIoutflows$_{ij}$. Hypothesis 2 is supported if γ_1 is negative and statistically significant.

To test Hypothesis 3a and 3b, I use the following model specification:

Ln FDIinflows$_{ij}$ = γ_0 + γ_1 Host country control of corruption$_{ij}$ + γ_2 Highly corrupt$_{ij}$ + βX_{ij} + ε_i + μ_{ij}

Ln FDIoutflows$_{ij}$ = γ_0 + γ^*_1 Home country control of corruption$_{ij}$ + γ^*_2 Lowly corrupt$_{ij}$ + βX_{ij} + ε_i + μ_{ij}

Where γ_1, γ^*_1, γ_2, and γ^*_2 are the parameters of interest; X_{ij} represents the vector of the control variables; ε_i represents the individual unobserved heterogeneity and μ_{ij} represents the time varying error that affect the dependent variables Ln FDIinflows$_{ij}$ and Ln FDIoutflows$_{ij}$ repectively. Hypothesis 3a is supported if both γ_1 and γ_2 is negative and statistically significant. Hypothesis 3b is supported if both γ^*_1 and γ^*_2 are positive and statistically significant.

4.   RESULTS

In this chapter, the results of this study are presented and I would be providing an explanation of what each output means and how each of the results presented supports or contradicts each hypothesis.

Table 4 and 5 present the results of the analysing the effect of corruption on FDI. Model 1a and 1b present the analysis with only control variables for both home and host country variables.

Table 4
Results of the analyses of the effect of corruption on bilateral FDI flows

	Dependent variable: Ln of bilateral FDI flows		
	Model 1a	Model 1b	Model 2
Host country control of corruption	-	-	0.0183**(0.00801)
Home country control of corruption	-	-	-
Host country inflation	-0.00223(0.00198)	-	-0.00218(0.00198)
Home country inflation	-	-0.000589(0.00103)	-
Host country GNI per capita	-0.0183***(0.00657)	-	-0.0179***(0.00657)
Home country GNI per capita		0.00389*(0.00210)	-
Ln host country GDP	0.0720***(0.00539)	-	0.0698***(0.00548)
Ln home country GDP	-	0.0258***(0.00138)	-
Ln host country population	-0.0124*(0.00658)	-	-0.00913(0.00673)
Ln distance	-0.0365***(0.00842)	-0.0236***(0.00378)	-0.0369***(0.00842)
Common border	0.0534(0.0439)	0.229***(0.0197)	0.0531(0.0439)
Common language	0.0815***(0.0127)	0.0327***(0.00572)	0.0793***(0.0128)
Common currency	-0.0548***(0.0202)	-0.0613***(0.0205)	1.800***(0.0697)
Common legal origin	0.00173(0.0119)	0.00636(0.00534)	0.00241(0.0119)
Colonial relationship	1.800***(0.0697)	0.280***(0.0313)	-0.127***(0.0451)
Natural resources	0.000770***(0.000244)	-0.000482***(0.000124)	0.000902***(0.000251)
Intercept	-1.062*** (0.102)	-0.363***(0.0468)	-1.036***(0.102)
Chi^2	1341.98	898.77	1347.89
N	8960	8,960	8960

Standard errors in parentheses
Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Model 1a and 1b shows the analysis with only the control variables. All control variables in Model 1a asides common legal origin, common border and host country inflation rate are statistically significant. Whereas in Model 1b; home country inflation, home country GNI per capita and common legal origin are the only statistically insignificant variables. In Model 1a, both the GNI per capita and GDP variables are statistically significant which means they are important variables in attracting FDI into African economies.

Table 5
Results of the analyses of the effect of corruption on bilateral FDI flows

	Dependent variable: Ln of bilateral FDI flows		
	Model 3	Model 4a	Model 4b
Host country control of corruption	-	-	-
Home country control of corruption	0.0123***(0.00380)	-	-
Highly corrupt	-	0.00401(0.00926)	-
Lowly corrupt	-	-	0.0108**(0.00451)
Host country inflation	-	-1.91e-06(1.70e-06)	-
Home country inflation	-0.000521(0.00103)	-	-0.000590(0.00103)
Host country GNI per capita	-	-2.90e-06***(1.04e-06)	
Home country GNI per capita	0.00271(0.00213)	-	0.00289(0.00214)
Ln host country GDP	-	0.0724***(0.00549)	
Ln home country GDP	0.0259***(0.00138)	-	0.0258***(0.00138)
Ln host country population	-	-0.0130*(0.00675)	-
Ln distance	-0.0240***(0.00377)	-0.0364***(0.00842)	-0.0240***(0.00376)
Common border	0.229***(0.0197)	0.0536(0.0439)	0.229***(0.0196)
Common language	0.0312***(0.00573)	0.0818***(0.0128)	0.0318***(0.00570)
Common currency	-0.0530***(0.0202)	-0.131***(0.0451)	-0.0547***(0.0201)
Common legal origin	0.00678 (0.00534)	0.00162 (0.0119)	0.00668(0.00532)
Colonial relationship	0.280***(0.0313)	1.800***(0.0697)	0.280***(0.0311)
Natural resources	-0.000333**(0.000132)	0.000756***(0.000246)	-0.000423***(0.000126)
Intercept	-0.357***(0.0468)	-1.052***(0.102)	-0.364***(0.0466)
Chi^2	910.49	1342.31	911.90
N	8960	8960	8960

Standard errors in parentheses
Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Other control variables such as log of population, log of distance, common language, colonial relationship, common currency and natural resources are significant and have an influence on the flow of FDI into Africa.

In Model 1b, the variable inflation is negative and insignificant and therefore does not have an influence on the flow of FDI into African economies. The only insignificant control variable is common legal origin. This variable is positive but since it is insignificant, it has no influence on the dependent variable.

In Model 2, I introduce the first dependent which is the host country control of corruption. Recall that the control of corruption index runs from -2.5 to 2.5. A positive score indicates that a country has less corruption while a negative score suggests that a country is more corrupt. The coefficient of the host control of corruption is positive and statistically significant. The positive coefficient of the host country control of corruption suggests that African countries have a higher control of corruption and therefore means that host country control of corruption (positive index) attracts inward foreign direct investments into African economies. In other words, rejecting the negative influence of corruption on inward FDI. This does not support the first hypothesis. The higher the control of corruption in African economies, the greater the level of inward FDI flows. In sum, inward FDI flows is attracted to African countries that have a higher control of corruption.

Model 3 presents the analysis with the effect of home country control of corruption included as the main independent variable and how it influences outward FDI. This measures the flow of foreign direct investment out of African countries and how corruption affects outward FDI. The coefficient of the home country control of corruption is positive but statistically insignificant. The output does not provide meaningful results and therefore I cannot make any judgement as there is no statistical evidence to back up hypothesis 2. Thus, there is no evidence that corruption is negatively related to outward FDI from African countries. Perhaps it could be that the effect of African diaspora on outward foreign direct investment which is not included in this study has an impact on the flow of FDI out of African economies. In sum, I find no evidence that corruption has a negative effect on the flow of FDI out of African economies.

Models 4a and 4b provides the analysis of the results with threshold for control of corruption formulated. A score above zero means low level of corruption and a score below zero means a higher level of corruption. In Model 4a, the coefficient of this variable is

positive but statistically insignificant. Hence, I cannot make any judgement from hypothesis 3a. Model 4b presents the results of the analysis of the influence of low level corruption on outward foreign direct investment. The coefficient is positive and statistically significant as expected. This result supports hypothesis 3b. A low level of corruption promotes FDI flows out of African countries.

Models 4a and 4b provides the analysis of the results with threshold for corruption created to distinguish between highly corrupt African countries and Lowly corrupt African countries. Again, recall that the dependent variables, home and host country control of corruption is an index that runs from -2.5 to 2.5. A score above zero means low level of corruption (positive index) and a score below zero means a higher level of corruption (negative index). In Model 4a, the coefficient of corruption is positive but statistically insignificant. This does not support the first part of hypothesis three that high level of corruption affects inward FDI into African economies compared to countries with a low level of corruption. Thus, there is no evidence that a high level of corruption is negatively related to inward FDI compared to countries with a low level of corruption. Perhaps, it could be that companies and countries investing into African countries care more about what the natural resources because this variable is positive and significant; rather than bothering about the danger that corruption poses to investors from foreign countries. Moving on to model 4b, where I test if a low level of corruption has a positive influence on outward FDI from African economies. The coefficient of corruption is positive and statistically significant. This supports hypothesis 3b. The results suggest that for African countries with a low level of corruption, the flow of FDI out of this country is higher when compared to countries with a higher level of corruption. This shows that non-African countries are cautious of dealing with investors from countries that are highly corrupt. Also, the coefficient of natural resources in this last model is negative which could mean that the type investments made by African countries abroad are non-resource seeking types of FDI.

The results from the full sample suggest that corruption promotes both inward and outward FDI, However, splitting the corruption variable into highly and lowly corruption reveals that a low level of corruption promotes outward FDI. In all the models, the variable GDP is significant and positive, which suggests that market size is an important determinant of inward and outward FDI. Also in all regressions, the variable log of distance was negative and

significant which means investors take into consideration the distance between host and home country and it is an important factor in foreign direct investment.

5.   CONCLUSION AND DISCUSSION

This study examined the relationship between corruption and bilateral FDI flows in Africa. Previous empirical studies have so far found conflicting results and the direction of the effect is an ongoing debate in academia. Most African countries attract FDI inflows but are the benefits associated with FDI commensurate? This study not only analyses the relationship between FDI inflows into African countries and corruption; but takes a step further by examining how corruption influences outward FDI investments from African countries. The data used in this study are based on international statistics on FDI aggregated by origin and destination countries. Therefore, it aggregates all individual and government projects and provides a different outlook on how investors react to corruption in Africa.

The results of this study show that African countries with a low level of corruption attract more FDI. The higher the control of corruption, the more the increase of FDI into African economies. The result adds significantly to our understanding of FDI flows into African countries and how investors pay attention to the level of corruption in countries they are investing in. The positive index of control of corruption on bilateral FDI flows shows that firms do not support corruption. In addition, when the countries were grouped according to their levels of corruption, a low level of corruption promotes outward FDI. This further suggests that foreign firms or governments are unwilling to deal with investment from corrupt African countries. This point should be further investigated as it has not yet been empirically tested in literature.

Table 6 gives an overview of the hypotheses tested in this research and shows if they were supported or not.

Table 6
Overview of the tested hypotheses

Nr.	Hypotheses	Supported
1	**Corruption is negatively related to inward FDI**	**No**
2	**Corruption is negatively related to outward FDI**	**No**
3a	**IFDI has a negative relationship with highly corrupt country**	**No**
3b	**OFDI has a positive relationship with lowly corrupt country**	**Yes**

Further, I also find that past colonial ties with other countries boosts bilateral FDI flows with Africa. This shows the importance of culture and how it boosts trade between countries. In models tested, past colonial ties show to have a positive effect on FDI. Do countries favour

trade or investments with their colonizers and what role does culture play in boosting FDI? Future research should address how past colonial ties influence FDI flows.

The empirical findings are subject to some limitations due to the nature of the data. First, I aggregated the corruption levels in all the African economies. Future research can analyse specific countries in Africa that receive large portions of FDI and analyse how corruption affects it. Second, I created a threshold and made a distinction between lowly corrupt countries and highly corrupt countries. Future research can look at other types of corruption such as pervasive or arbitrary corruption; and how it influences FDI in African countries. Third, the nature of the data set used in this study is such that all sectors are aggregated and different sectors may have different sensitivity to corruption. Future studies may consider different sectors in the African economy and how corruption affects each sector.

Overall, the contribution of this study is twofold. First, it is one of the few studies analysing bilateral FDI flows into Africa and how corruption affect this flow. It offers a solution to the ongoing debate about the debate on whether corruption has a negative or positive effect on FDI. Additionally, this study distinguishes between two types of corruption and how it influences FDI.

Second, it presents a foundation for further research into corruption and FDI in Africa. There are few studies that focus on corruption and FDI in Africa countries. This study serves as a guide and provides a foundation for future studies in this area.

In terms of implications for international business and African policy, this study stresses the need for policy makers in Africa to take note of the level of corruption in their countries as this is an important factor in attracting FDI into this region. This study has shown that investors are wary of investing in countries with a high level of corruption because it increases the cost and risk of running a business. This should serve as a guideline to governments in the African region who need to attract investment.

6. REFERENCES

Abed, G. T., & Davoodi, H. R. (2000). Corruption, structural reforms, and economic performance in the transition economies.

Abbott, A., Cushman, D. O., & De Vita, G. (2012). Exchange rate regimes and foreign direct investment flows to developing countries. *Review of International Economics*, *20*(1), 95-107.

Aidt, T. S. (2009). Corruption, institutions, and economic development. *Oxford Review of Economic Policy*, *25*(2), 271-291.

Akcay, S. (2001). Is Corruption an Obstacle for Foreign Investors in Developing Countries? A Cross-Country Evidence. *Yapi Kredi Economic Review*, *12*(2), 27-34.

Alemu, A. M. (2012). Effects of Corruption on FDI Inflow in Asian Economies. *Seoul Journal of Economics*, *25*(4), 387-412.

Aliber, R. Z. (1970). A theory of foreign direct investment. In *The International Corporation*. MIT Press Cambridge, MA.

Al-sadiq, A. (2013). Outward foreign direct investment and domestic investment: The case of developing countries.

Andreff, V. (2003). The newly emerging TNCs from economies in transition: a comparison with Third World outward FDI. *Transnational corporations*, *12*(2), 73-118.

Anoruo, E., & Braha, H. (2005). Corruption and economic growth: The African experience. *Journal of Sustainable Development in Africa*, *7*(1), 43-55.

Asiedu, E. (2006). Foreign direct investment in Africa: The role of natural resources, market size, government policy, institutions and political instability. *The World Economy*, *29*(1), 63-77.

Asiedu, E., & Freeman, J. (2009). The effect of corruption on investment growth: Evidence from firms in Latin America, Sub-Saharan Africa, and transition countries. *Review of Development Economics*, *13*(2), 200-214.

Asongu, S. A. (2013). Fighting corruption in Africa: do existing corruption-control levels matter?. *International Journal of Development Issues*, *12*(1), 36-52.

"Anti-Corruption". *World Bank*. N.p., 2016. Web. 14 Sept. 2016.

Bailey, N., & Li, S. (2015). Cross-national distance and FDI: the moderating role of host country local demand. *Journal of International Management*,*21*(4), 267-276.

Barassi, M. R., & Zhou, Y. (2012). The effect of corruption on FDI: A parametric and non-parametric analysis. *European Journal of Political Economy*, *28*(3), 302-312.

Blackburn, K., Bose, N., & Emranul Haque, M. (2010). Endogenous corruption in economic development. *Journal of Economic Studies*, *37*(1), 4-25.

Bolgorian, M. (2011). Corruption and stock market development: A quantitative approach. *Physica A: Statistical Mechanics and its Applications*, *390*(23), 4514-4521.

Branstetter, L. (2006). Is foreign direct investment a channel of knowledge spillovers? Evidence from Japan's FDI in the United States. *Journal of International economics*, *68*(2), 325-344.

Buckley, P. J., & Casson, M. (1976). *Future of the multinational enterprise*. Springer.

Casson, M. (2015). Coase and international business: The origin and development of internalisation theory. *Managerial and Decision Economics*,*36*(1), 55-66.

Carlson, S. (1966). International business research.

Chintrakarn, P., Herzer, D., & Nunnenkamp, P. (2012). FDI and income inequality: Evidence from a panel of US states. *Economic Inquiry*, *50*(3), 788-801.

Coase, R. H. (1937). The nature of the firm. *economica*, *4*(16), 386-405.

Corruption. Def. 8. (2016). In Oxford English dictionary Online (2nd ed.) Retrieved from

http://www.oed.com/view/Entry/42045?redirectedFrom=corruption#eid

Cuervo-Cazurra, A. (2006). Who cares about corruption? *Journal of International Business Studies*, *37*(6), 807-822.

Cuervo-Cazurra, A. (2008). Better the devil you don't know: Types of corruption and FDI in transition economies. *Journal of International Management*, *14*(1), 12-27.

Denisia, V. (2010). Foreign direct investment theories: An overview of the main FDI theories. *European Journal of Interdisciplinary Studies*, (3).

Dreher, A., & Gassebner, M. (2013). Greasing the wheels? The impact of regulations and corruption on firm entry. *Public Choice*, *155*(3-4), 413-432.

Dunning, J. H. (1977). Trade, location of economic activity and the MNE: A search for an eclectic approach. In *The international allocation of economic activity* (pp. 395-418). Palgrave Macmillan UK.

Dunning, J. H. (1979). Explaining changing patterns of international production: in defence of the eclectic theory. *Oxford bulletin of economics and statistics*, *41*(4), 269-295.

Dunning, J. H. (1980). Toward an eclectic theory of international production: Some empirical tests. *Journal of international business studies*, *11*(1), 9-31.

Dunning J. H. (1981) International production and the multinational enterprise. G. Allen and Unwin, London

Dunning, J. H. (1988). The eclectic paradigm of international production: A restatement and some possible extensions. *Journal of international business studies*, *19*(1), 1-31.

Dunning, J.H. (1993) Multinational Enterprises in the Global Economy. Wokingham: Addison-Wesley.

Dunning, J. H. (1993). The Globalization of Business: The Challenge of the 1990s. *NY: Routledge*.

Dunning, J. (1995). Reappraising the Eclectic Paradigm in an Age of Alliance Capitalism. *Journal of International Business Studies, 26*(3), 461-491.

Egger, P., & Winner, H. (2005). Evidence on corruption as an incentive for foreign direct investment. *European journal of political economy*, *21*(4), 932-952.

Financial Times. (2015) (p. 3). Retrieved from
https://www.scribd.com/document/317904419/The-fDi-Report-2015-pdf
Financial Times. (2015) (p. 4). London. Retrieved from
http://www.africanbusinesscentral.com/wp-content/uploads/2016/01/The-Africa-Investment-Report-2015-fDi-Intelligence-Report.pdf
Forsgren, M. (2002). The concept of learning in the Uppsala internationalization process model: a critical review. *International business review*, *11*(3), 257-277.

Freckleton, M., Wright, A., & Craigwell, R. (2012). Economic growth, foreign direct investment and corruption in developed and developing countries.*Journal of economic studies*, *39*(6), 639-652.

Graeff, P., & Mehlkop, G. (2003). The impact of economic freedom on corruption: different patterns for rich and poor countries. *European Journal of Political Economy*, *19*(3), 605-620.

Guetat, I. (2006). The effects of corruption on growth performance of the MENA countries. *Journal of Economics and Finance*, *30*(2), 208-221.

Gupta, S., Davoodi, H., & Alonso-Terme, R. (2002). Does corruption affect income inequality and poverty? *Economics of governance*, *3*(1), 23-45.

Gyimah-Brempong, K. (2002). Corruption, economic growth, and income inequality in Africa. *Economics of Governance*, *3*(3), 183-209.

Habib, M., & Zurawicki, L. (2002). Corruption and foreign direct investment. *Journal of international business studies*, 291-307.

Hakkala, K. N., Norbäck, P. J., & Svaleryd, H. (2008). Asymmetric effects of corruption on FDI: evidence from Swedish multinational firms. *The Review of Economics and Statistics*, *90*(4), 627-642.

Heckscher, E. F. (1919). *The effect of foreign trade on the distribution of income*.

Helping Countries Combat Corruption: The Role of The World Bank. (1997) (p. 8). Retrieved from http://www1.worldbank.org/publicsector/anticorrupt/corruptn/coridx.htm

Henisz, W. J. (2003). The power of the Buckley and Casson thesis: the ability to manage institutional idiosyncrasies. *Journal of international business studies*, *34*(2), 173-184.

Hennart, J. F. (1982). *A theory of multinational enterprise*. Univ of Michigan Pr.

Herzer, D., Hühne, P., & Nunnenkamp, P. (2014). FDI and Income Inequality—Evidence from Latin American Economies. *Review of Development Economics*, *18*(4), 778-793.

Ho, C. S., & Rashid, H. A. (2011). Macroeconomic and country specific determinants of FDI. *The Business Review*, *18*(1), 219-226.

Hosseini, H. (2005). An economic theory of FDI: A behavioral economics and historical approach. *The Journal of Socio-Economics*, *34*(4), 528-541.

Huntington, S. P. (1968). *Political order in changing societies*. Yale University Press.

Hymer, S. H. (1976). *The international operations of national firms: A study of direct foreign investment* (Vol. 14, pp. 139-155). Cambridge, MA: MIT press.

Imam, P. A., & Jacobs, D. (2014). Effect of corruption on tax revenues in the Middle East. *Review of Middle East Economics and Finance Rev. Middle East Econ. Fin.*, *10*(1), 1-24.

Jain, A. K. (2001). Corruption: A review. *Journal of economic surveys*, *15*(1), 71-121.

Javorcik, B. S., & Wei, S. J. (9). Corruption and cross-border investment in emerging markets: Firm-level evidence. *Journal of International Money and Finance*, *28*(4), 605-624.

Johanson, J., & Vahlne, J. E. (1977). The internationalization process of the firm—a model of knowledge development and increasing foreign market commitments. *Journal of international business studies*, *8*(1), 23-32.

Johanson, J., & Wiedersheim-Paul, F. (1975). The internationalization of the firm—four swedish cases 1. *Journal of management studies*, *12*(3), 305-323.

Kang, Y., & Jiang, F. (2012). FDI location choice of Chinese multinationals in East and Southeast Asia: Traditional economic factors and institutional perspective. *Journal of World Business*, *47*(1), 45-53.

Kar, D., & Cartwright-Smith, D. (2010). Illicit financial flows from Africa: Hidden resource for development.

Kaufmann, D. (1997). Corruption: the facts. *Foreign policy*, 114-131.

Krueger, A. O. (1993). Virtuous and vicious circles in economic development. *The American Economic Review*, *83*(2), 351-355.

Laffont, J. J., & Tirole, J. (1993). *A theory of incentives in procurement and regulation*. MIT press.

Lambsdorff, J. G., & Cornelius, P. (2000). Corruption, foreign investment and growth. *The Africa competitiveness report*, *2001*, 70-78.

Lambsdorff, J. G. (2003). How corruption affects productivity. *Kyklos*, *56*(4), 457-474.

Lecraw, D. J. (1993). Outward direct investment by Indonesian firms: Motivation and effects. *Journal of International Business Studies*, *24*(3), 589-600.

Leff, N. H. (1964). Economic development through bureaucratic corruption. *American behavioural scientist*, *8*(3), 8-14.

Levy, D. (2007). Price adjustment under the table: Evidence on efficiency-enhancing corruption. *European Journal of Political Economy*, *23*(2), 423-447.

Leys, C. (1965). What is the Problem about Corruption? *The Journal of Modern African Studies, 3*(2), 215-230. Retrieved from http://www.jstor.org/stable/158703

Li, P. P. (2007). Toward an integrated theory of multinational evolution: The evidence of Chinese multinational enterprises as latecomers. *Journal of international management*, *13*(3), 296-318.

Lui, F. T. (1985). An equilibrium queuing model of bribery. *Journal of political economy*, *93*(4), 760-781.

Luo, Y., & Rui, H. (2009). An ambidexterity perspective toward multinational enterprises from emerging economies. *The Academy of Management Perspectives*, *23*(4), 49-70.

Luo, Y., & Tung, R. L. (2007). International expansion of emerging market enterprises: A springboard perspective. *Journal of international business studies*, *38*(4), 481-498.

Luo, Y., & Wang, S. L. (2012). Foreign direct investment strategies by developing country multinationals: A diagnostic model for home country effects. *Global Strategy Journal*, *2*(3), 244-261.

Mathews, J. A. (2002). Competitive advantages of the latecomer firm: A resource-based account of industrial catch-up strategies. *Asia Pacific Journal of Management*, *19*(4), 467-488.

Mathews, J. A. (2006). Dragon multinationals: New players in 21st century globalization. *Asia Pacific journal of management*, *23*(1), 5-27.

Mathur, A., & Singh, K. (2013). Foreign direct investment, corruption and democracy. *Applied Economics*, *45*(8), 991-1002.

Méon, P. G., & Weill, L. (2010). Is corruption an efficient grease? *World development*, *38*(3), 244-259.

Moon, B. (2010). In *Inaugural Conference of the International Anti-Corruption Academy*. Vienna. Retrieved from https://www.un.org/sg/en/content/sg/speeches/2010-09-02/remarks-inaugural-conference-international-anti-corruption-academy

Moosa, I. A., & Cardak, B. A. (2006). The determinants of foreign direct investment: An extreme bounds analysis. *Journal of Multinational Financial Management*, *16*(2), 199-211.

Nayak, D., & Choudhury, R. N. (2014). A selective review of foreign direct investment theories. *Asia-Pacific Research and Training Network on Trade, Working Paper*, (143).

OECD Convention on Combating Bribery of Foreign Public Officials in International

Business Transactions.

Retrieved from:http://www.oecd.org/corruption/oecdantibriberyconvention.htm

Ohlin, B. (1967). Interregional and international trade.

Onyeiwu, S., & Shrestha, H. (2004). Determinants of foreign direct investment in Africa. *Journal of*

Developing Societies, *20*(1-2), 89-106.

Peng, M. W. (2012). The global strategy of emerging multinationals from China. *Global Strategy Journal*, *2*(2), 97-107.

Porter, M. E. (1990). The competitive advantage of notions. *Harvard business review*, *68*(2), 73-93.

Rashid, S. (1981). Public utilities in egalitarian LDC's: The role of bribery in achieving Pareto efficiency.

Ray, S. (2012). Impact of Foreign Direct Investment on Economic Growth in India: A Co

integration Analysis. *Advances in Information Technology and Management*, *2*(1), 187-201.

Read, R. (2008). Foreign direct investment in small island developing states.*Journal of International Development*, *20*(4), 502-525.

Rose-Ackerman, S. (Ed.). (2007). *International handbook on the economics of corruption*. Edward Elgar Publishing.

Rose-Ackerman, S. (1978). *Corruption: A study in political economy*. Academic press.

Rugman, A. M. (1981). *Inside the multinationals: The economics of internal markets*. Taylor & Francis.

Sharifi-Renani, H., & Mirfatah, M. (2012). The impact of exchange rate volatility on Foreign Direct Investment in Iran. *Procedia Economics and Finance*, *1*, 365-373.

Shleifer, A., & Vishny, R. (1993). Corruption. *The Quarterly Journal of Economics, 108*(3), 599-617.

Sanfilippo, M. (2010). Chinese FDI to Africa: What is the nexus with foreign Economic cooperation? *African Development Review*, *22*(s1), 599-614.

Talamo, G. (2007). Institution, FDI and the gravity model. *Dipartimento di Studi e Política, Facoltà di Giurisprudenza, Università di Palermo*.

Tanzi, V. (1998). Corruption around the world: Causes, consequences, scope, and cures. *Staff Papers-International Monetary Fund*, 559-594.

Tate, W. L., Ellram, L. M., Bals, L., Hartmann, E., & van der Valk, W. (2010). An agency theory perspective on the purchase of marketing services. *Industrial Marketing Management*, *39*(5), 806-819.

Transparency International. (2000). Retrieved from
http://archive.transparency.org/publications/sourcebook

United Nations Economic Commission for Africa, (2011). *Combating Corruption, Improving*

Governance in Africa (pp. 3 - 5). Mombasa, Kenya. Retrieved from

http://www.uneca.org/publications/combating-corruption-improving-governance-africa

United Nations Economic Commission for Africa, (2016). *Africa Governance Report IV*. Addis

Ababa. Retrieved from

http://www.uneca.org/sites/default/files/PublicationFiles/agr4_eng_fin_web_11april.pdf

Vial, V., & Hanoteau, J. (2010). Corruption, manufacturing plant growth, and the Asian

paradox: Indonesian evidence. *World Development*, *38*(5), 693-705.

Voyer, P. A., & Beamish, P. W. (2004). The effect of corruption on Japanese foreign direct

investment. *Journal of Business Ethics*, *50*(3), 211-224.

Welch, L. S., & Luostarinen, R. (1988). Internationalization: evolution of a concept. *The

Internationalization of the firm*, *14*, 83-98.

Wei, S. J. (2000a). How taxing is corruption on international investors? *Review of economics

and statistics*, *82*(1), 1-11.

Wei, S. J., & Shleifer, A. (2000b). Local corruption and global capital flows. *Brookings Papers

on Economic Activity*, (2), 303-346.

Xu, X., & Sheng, Y. (2012). Productivity spillovers from foreign direct investment: firm-

level evidence from China. *World Development*, *40*(1), 62-74.

Yiu, D. W. (2011). Multinational advantages of Chinese business groups: A theoretical

exploration. *Management and Organization Review*, *7*(2), 249-277.

YUE, Y., & FAN, T. (2014). Institution Environment and Location Choice of China's

Outward FDI in Asia. *Finance & Trade Economics*, *6*, 008.

7. APPENDIX

Source countries included in the inflow FDI analysis

Algeria	Israel	Spain
Angola	Italy	Sri Lanka
Argentina	Japan	Sudan
Australia	Jordan	Sweden
Austria	Kazakhstan	Switzerland
Bahamas	Kenya	Taiwan
Bahrain	Kuwait	Tanzania
Belgium	Latvia	Thailand
Bermuda	Lebanon	Togo
Bosnia-Herzegovina	Libya	Tunisia
Botswana	Lithuania	Turkey
Brazil	Luxembourg	UAE
Bulgaria	Malawi	UK
Burundi	Malaysia	Uganda
Cameroon	Mali	Ukraine
Canada	Malta	United States
Cayman Islands	Mauritius	Venezuela
Chile	Mexico	Vietnam
China	Mongolia	Yemen
Cote d'Ivoire	Morocco	Zambia
Croatia	Mozambique	Zimbabwe
Cuba	Myanmar (Burma)	
Cyprus	Namibia	
Czech Republic	Netherlands	
Democratic Republic of Congo	New Zealand	
Denmark	Nigeria	
Egypt	Norway	
Estonia	Oman	
Ethiopia	Pakistan	
Finland	Philippines	
France	Poland	
Gabon	Portugal	
Germany	Qatar	
Ghana	Romania	
Greece	Russia	
Haiti	Rwanda	
Hong Kong	Saudi Arabia	
Hungary	Senegal	
Iceland	Singapore	
India	Slovakia	
Indonesia	Slovenia	
Iran	South Africa	
Ireland	South Korea	

Destination countries included in inflow FDI analysis

Algeria	Guinea Bissau	Sierra Leone
Angola	Kenya	South Africa
Benin	Lesotho	Sudan
Botswana	Liberia	Swaziland
Burkina Faso	Libya	Tanzania
Burundi	Madagascar	Togo
Cameroon	Malawi	Tunisia
Central African Republic	Mauritania	Uganda
Comoros	Mauritius	Zambia
Djibouti	Morocco	Zimbabwe
Equatorial Guinea	Mozambique	
Eritrea	Namibia	
Ethiopia	Nigeria	
Ghana	Rwanda	
Guinea	Seychelles	

Source countries included in the outflow FDI analysis

Algeria
Angola
Botswana
Burundi
Cameroon
Equatorial
Guinea
Ethiopia
Ghana
Kenya
Libya
Madagascar
Malawi
Mauritius
Morocco
Mozambique
Namibia
Nigeria
Rwanda
South Africa
Sudan
Tanzania
Togo
Tunisia
Uganda
Zambia
Zimbabwe

Destination countries included in the outflow FDI analysis

Algeria	Guinea Bissau	Senegal
Angola	Hong Kong	Sierra Leone
Argentina	Hungary	Slovakia
Australia	India	Somalia
Bahrain	Indonesia	South Africa
Bangladesh	Iran	Spain
Belarus	Iraq	Sri Lanka
Belgium	Ireland	Swaziland
Benin	Israel	Sweden
Bolivia	Italy	Switzerland
Botswana	Japan	Taiwan
Brazil	Kazakhstan	Tanzania
Bulgaria	Kenya	Togo
Burkina Faso	Latvia	Tunisia
Burundi	Lesotho	Turkey
Cambodia	Liberia	UAE
Cameroon	Libya	UK
Canada	Macedonia FYR	Uganda
Cape Verde	Madagascar	United States
Central African Republic	Malawi	Uzbekistan
Chad	Malaysia	Venezuela
Chile	Malta	Vietnam
China	Mauritania	Yemen
Colombia	Mauritius	Zambia
Comoros	Mexico	Zimbabwe
Congo	Mongolia	
Cote d'Ivoire	Morocco	
Cyprus	Mozambique	
Czech Republic	Namibia	
Democratic Republic of Congo	Nepal	
Denmark	Netherlands	
Djibouti	Niger	
Dominican Republic	Nigeria	
Ecuador	Oman	
Egypt	Papua New Guinea	
Equatorial Guinea	Peru	
Estonia	Philippines	
Ethiopia	Poland	
France	Portugal	
Gabon	Qatar	
Gambia	Reunion	
Georgia	Romania	
Germany	Russia	
Ghana	Rwanda	
Guinea	Sao Tome and Principe	
Guinea Bissau	Saudi Arabia	

**Correlation table is not included due to the large number of variables in the final data set. They are available on request.