



**ASHESI UNIVERSITY**

**THE IMPACT OF CORRUPTION ON FOREIGN DIRECT INVESTMENT INFLOW  
IN GHANA**

By

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Business Administration Degree

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**DECLARATION**

I hereby declare that this thesis is an original work by me and has not been submitted to this or any other educational institution.

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I hereby declare that the preparation and presentation of this thesis were supervised according to the guidelines specified by Ashesi University on capstone supervision.

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Date.....

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## ABSTRACT

In Ghana, the attraction of FDI is identified among the strategies for achieving the Ghana beyond aid agenda. Meanwhile, corruption, which is a major factor affecting FDI inflow, is very high in Ghana, making it necessary to investigate its impact on Ghana's FDI inflow.

The findings on the impact of corruption on FDI have been inconclusive. Two main theories underlie the corruption-FDI relationship, namely, the grabbing hand and the helping hand. The grabbing hand posits that corruption negatively impacts FDI by raising transaction costs. The proponents of the helping hand argue that corruption serves as grease in the wheels of commerce in the absence of strong institutions, hence making a country more attractive for FDI.

The autoregressive distributed lag estimator is used to estimate the relationship between corruption and FDI inflow and to determine the effect of the 2008 financial crisis on the corruption-FDI relationship in Ghana. The study checks whether the regression results depend on the corruption index used by estimating the two different regressions, each with different corruption index.

The results show that FDI inflow has a significant positive relationship with  $\text{corruption}_t$  but its lag is insignificant. When tested jointly, corruption and its lag have insignificant relationship with FDI. The 2008 financial crisis had insignificant negative effect on the corruption-FDI relationship.

Moreover, estimating with the control of corruption shows different results from estimating with corruption perceptions index. This suggests that the differences in results on the topic may be due to the choice of corruption index.

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## **CHAPTER ONE: INTRODUCTION**

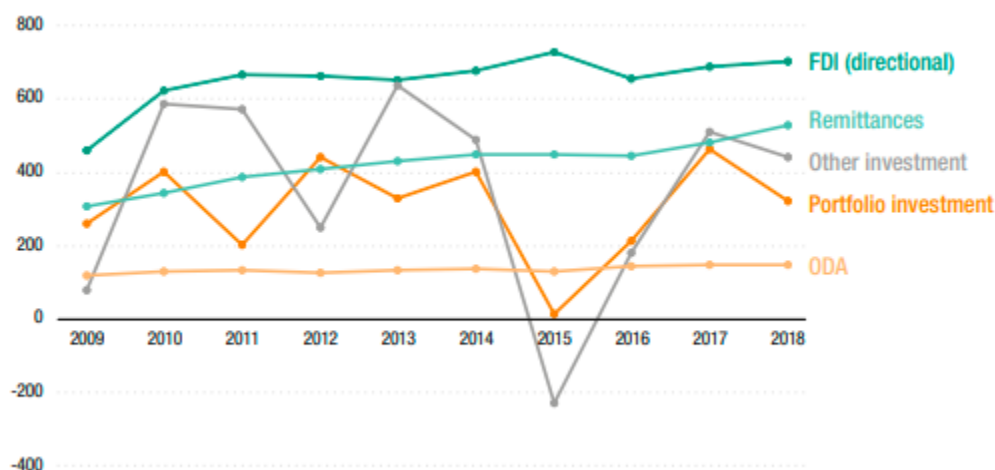
### **1.1 Background**

Foreign direct investment (FDI) has become one of the major catalysts for development; thus, many countries are ensuring that they take the necessary steps to make themselves attractive for it (Omodero, 2019; Darley, 2012; Velde, 2001). The efforts being made by various countries to attract FDI lies in the fact that it offers several benefits to the destination countries. Access to technology, income, technology, managerial skills, local market competition, employment opportunity, and access to the global market are some of the significant benefits countries enjoy from foreign direct investments (Castro & Nunes, 2013). Studies have shown that foreign direct investment inflow impacts economic growth positively in the long- run (Owusu-Antwi & Erickson, 2018).

Foreign direct investment, according to the International Monetary Fund (1993), is the investment made to gain a lasting interest in an entity different from the economy of the investor, with the investor having at least 10% of the total stock of the entity. The definition points out that FDI must be a lasting investment, which implies that it must be a long-term investment for an investment to be considered an FDI.

Foreign direct investment inflow is critical for developing countries as it contributes in diverse ways to their development. Omodero submits that FDI inflow “has many implications for developing countries especially in providing foreign currency and capital required for investment, as well as the transfer of managerial skills and development of human capital” (2019, p. 55). In effect, developing countries are doing their best to attract foreign investors (Eguae-Obazee, 2014).

In developing countries, foreign direct investment inflow is a significant source of capital for investments. *Figure 1* below shows the major sources of external capital in developing economies. The figure shows that since 2009, foreign direct investment, compared to remittances, official development assistance (ODA), and portfolio investment has been the main source of capital for developing economies.



*Figure 1.* Sources of external financing for developing economies, 2009 – 2018 (billions of US dollars).

Source: United Nations Conference on Trade and Developments (UNCTAD) World Investments Report 2019. Figure I.10. Developing Economies: Sources of external finance, 2009-2018. p. 12.

The need for foreign direct investment is even higher in Ghana due to the country's "Ghana Beyond Aid" agenda, which seeks to make Ghana an aid-independent country. The provision of a conducive private sector environment for businesses to promote local businesses and foreign direct investment is one of the major policy reforms towards achieving a Ghana beyond aid (Government of Ghana, 2019). The government

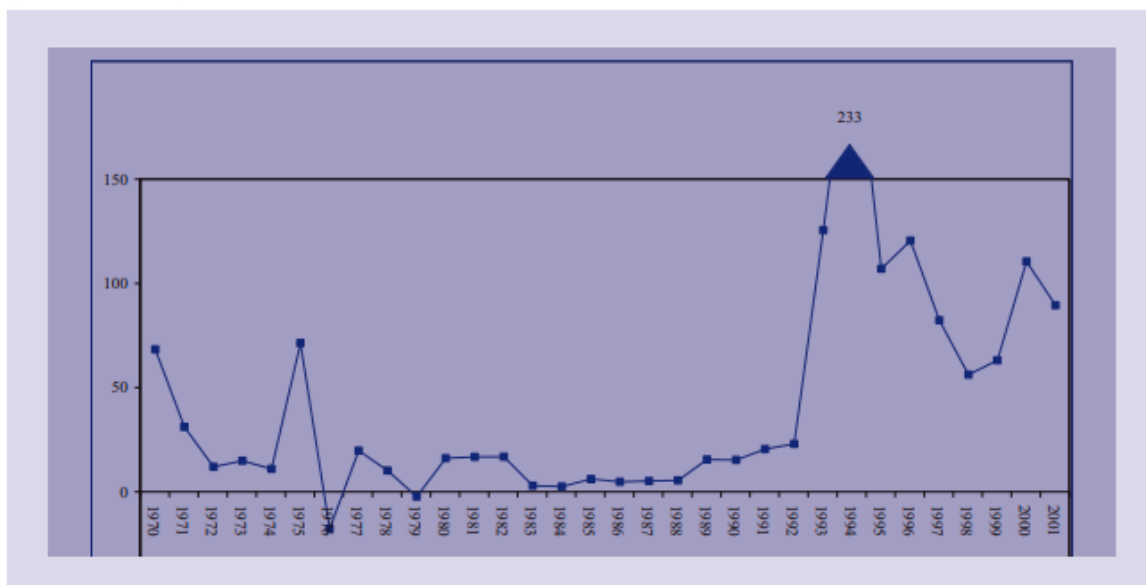
aims to get multinational firms to be linked with local firms; through that, the latter would be inserted into the global supply chain. Given the background information above, it is safe to conclude that FDI is crucial to developing countries and even more so in Ghana.

However, it is worth emphasizing that the flow of FDI is affected by several factors. Some studies have found that countries with good regulatory frameworks attract more FDI, while those with weak regulatory frameworks attract less FDI because they cannot guarantee the safety of investments (Peres, Ameer & Xu, 2018). Also, FDI inflow is determined by macroeconomic variables such as corruption and the rule of law (Omodero, 2019).

### **1.1.1 Foreign Direct Investment Inflow Trend in Ghana**

Realizing the benefits of FDI, Ghana has historically embarked on various policy reforms to promote FDI inflow. The Economic Recovery Programme(1983), the Investment Code Act(1985), the Agenda 2020, and the Ghana Investment Act(1994) are some of the projects that had significant impacts on Ghana's FDI inflow (Tsikata, Asante & Gyasi, 2000). Also, past and current presidents and their cabinets have toured Europe, America, and other parts of the world to convince investors about the investment opportunities in Ghana.

After introducing the Economic Recovery Programme in 1983, the FDI inflow remained very low before picking up eventually (UNCTAD, 2003a). Tsikata, Asante and Gyasi (2000) classify the FDI inflows from 1983 to 1996 into three stages due to the different trends in FDI during this period (refer to *figure 2*). The figure shows the different phases of Ghana's FDI of inflow.



*Figure 2.* The Trend in FDI Inflows to Ghana from 1970 to 2001(in million US dollars)

Source: UNCTAD (2003) Figure 1.1 FDI flows to Ghana 1970 -2001. Investment Policy Review, p.3.

- The first phase (1983-1988) is the sluggish phase. This period is characterized by stagnant growth in FDI immediately after the economic reform (ERP), with 2 million US dollars in 1984 and 5.6 million US dollars in 1985 as the lowest and highest, respectively.
- The second phase (1989-1992) is the moderate phase, characterized by a gradual rise in FDI with the lowest flow of 18.8 million US dollars and the highest flow of 22.5 million US dollars in 1992.
- The last phase (1993- 1996) is the significant flow stage, where FDI inflow saw a significant increase. It reached the lowest in 1995 with 106.5 million US dollars and reached its peak in 1994 with a total flow of 233 million US dollars. The unusual increase in FDI in 1994 reflects the privatization of the

Ashanti Goldfields Corporations, a highly priced asset of the government of Ghana at the time (UNCTAD, 2003).

The period between 2005 and 2016 witnessed an increased inflow of FDI, with the highest net inflow of 3.485 billion in 2016. Unfortunately, since 2016, FDI has been decreasing. It reduced to 3.255 billion in 2017 and declined even further to 2.989 billion in 2018.

### **1.1.2 The Corruption Phenomenon in Ghana**

Having realized the need for foreign direct investments in national development, most African countries have used incentives such as tax reduction for multinationals, trade liberalization, and privatization, among other policy reforms (Cleeve, 2012). One area, however, that has received less attention in the effort to promote FDI is political and institutional reforms. Meanwhile, institutional credibility, such as control of corruption, is a major constraining factor to FDI inflow. Perceptions about the corruption level in a country influence investors' decision to locate their firm in a destination country (Cleeve, 2012)

The World Bank defines corruption as “the abuse of public power for private gain” (1997, p. 8). Transparency International a leading global institution for fighting corruption, defines corruption as “the use of entrusted power for personal gain” (Transparency International, n.d). Both definitions emphasize that corruption is when people utilize the power given them for their own advantage. Most often, corruption occurs through the tool of bribery (World Bank, 1997). There is corruption when public servants exchange service for money or favors, when governments misuse public funds,

and when corporations bribe public officials to win a contract or other favours (Transparency International, n.d).

The effects of corruption on a country are numerous. It is argued that it creates mistrust, impedes economic progress, and creates social division (Transparency International, n.d). As money and favours are offered to people who can pay a bribe, the bribe payer and recipients become richer, while those who cannot pay enough bribe become poorer since they are denied access to opportunities (Transparency International, n.d).

Also, corruption could negatively impact FDI flow by diverting FDI into a particular sector and abandoning the other sectors or cause foreign investors to totally shun FDI inflow into a country (World Bank, 1997). In countries where corruption is high, investors usually choose to invest in light manufacturing or in trading where they can quickly relocate their activities when corruption becomes too high (World Bank, 1997).

Since the inception of the fourth republic of Ghana, control of corruption has been one of the major promises that have influenced electorates to vote for a candidate (Ghana Integrity Initiative, 2018). However, ‘if there are any parts of the social contract between the elected and the citizens which have been broken with careless abandon, it is the promise to fight corruption.’ (Ghana Integrity Initiative, 2018, pp. 1).

The poor performance of Ghana in the control of corruption is evidenced by the country's scores on the control of corruption index. Since 1996, on a scale of -2.5 to 2.5, Ghana has always had a negative score except in 2007 and 2010 (Kaufmann & Kraay, 2020). This is a clear indication that the country has not done much to put corruption under control.

In Ghana, corruption comes at a very high cost. It is one of the factors that hamper the successful activities of businesses in the country. Besides access to financing, corruption is the most problematic factor for doing business in Ghana (World Economic Forum, 2017). The implication is that the high level of corruption in the country is an obstacle to the smooth running of businesses, which includes foreign direct investments. Hence, if not controlled, can negatively affect Ghana's foreign direct investment inflow.

### **1.2 Problem Statement**

Corruption is a problem with several negative implications in Ghana. Though there are constitutional institutions and civil society organizations to help control corruption, these have not yielded many results.

Transparency International's annual index on corruption indicates that the country has not had any noticeable improvement in controlling corruption in recent times. The country had the highest rank of 48% in 2014 from 46% in the previous year, but this trend did not continue. By 2017, it had fallen to 40% and increased by only one percentage point in the following year and retained this position for 2019.

The continuous increase in corruption is a matter of concern because it imposes a cost to the country. Due to corruption, Ghana loses about 3 billion US dollars annually that could be used for developmental projects (Universal Periodic Review, 2017; IMANI, 2016). Additionally, corruption serves as an impediment to businesses in the country. As noted earlier, with the exception of access to finance, corruption is the most problematic factor that stands in the way of business in Ghana. Several studies have also found that corruption impacts FDI negatively (Eguae Obazee, 2014; Karim, Karim & Nasharuddin, 2018).



In this period that foreign direct investment promotion is identified as one of the main strategies towards the achievement of the “Ghana Beyond Aid” vision, and at the same time, corruption is on the ascendancy; it becomes critically important to research into how corruption affects FDI to provide lessons for policymakers.

To make matters worse, the recent pandemic (Covid-19) has already impacted the world’s finances negatively, and the effect is expected to continue for some uncertain time. The pandemic is forecasted to reduce the world’s total FDI flow by 40% in 2020 and even reduce it further by 5% to 10% in 2021, which in effect may cause FDI attraction to be more competitive as every economy makes an effort to recover from the economic distress caused by the pandemic (UNCTAD, 2020a).

When Ghana is in much need of FDI to achieve its beyond aid agenda, corruption keeps increasing without much effort to put the situation under control. Simultaneously, there is tight competition for FDI due to its decline, and the competition is even expected to tighten. Therefore, this research studies how this increasing corruption affects foreign direct investment inflow in Ghana.

### **1.3 Research Question and Objectives**

- What is the relationship between corruption and foreign direct investment inflow in Ghana?

The study aims to:

- Determine the impact of corruption on foreign direct investment inflow in Ghana.
- Determine how the 2008 financial crisis affected the relationship between corruption and foreign direct investment inflow in Ghana.

### **1.5 Research Scope and Justification**

The corruption-FDI relationship is a topic that has received a lot of attention. Yet, scholars for a long time have been divided on the effects of corruption on FDI. The debate on the impact of corruption on FDI is still ongoing and still heated, as there have not been any conclusive findings. One side of the debate finds a positive relationship between corruption and FDI (Hines, 1995; Omodero, 2019), while the other side finds a negative relationship (Wei, 1997; Cuervo-Cazurra, 2007). Others find no significant relationship between corruption and FDI (Okafor, 2015; Cleeve, 2012). This leaves a gap for other researchers to contribute to the existing knowledge.

To the best of the researcher's knowledge, there has not been any study that considers the effect of the 2008 financial crisis on the corruption-FDI relationship in Ghana. Therefore, the uniqueness of the study lies in its consideration of the impact of the 2008 financial crisis on the corruption-FDI relationship in Ghana.

### **1.6 Research Relevance**

This research will be beneficial to the Government of Ghana, the Ministry of Trade and Industry, and the Ghana Investment Promotion Center (GIPC). The research findings will provide them with lessons about how FDI inflow in Ghana responds to corruption levels in the country. The findings from testing the impact of the 2008 financial crisis on the corruption-FDI relationship in Ghana will also provide lessons that could be useful in the future if the country enters into another financial crisis.

### **1.7 Overview of Methodology**

In this study, the autoregressive distributed lag estimator will be used to determine the relationship between corruption and FDI in Ghana and how the 2008

financial crisis impacted this relationship. The study will rely on time series data from 1980-2019. The impact of the 2008 financial crisis on the corruption-FDI relationship will be determined by interacting a dummy variable with the FDI variable.

### **1.8 Organization of Study**

The rest of the thesis is organized as follows: Chapter two provides an overview of corruption and FDI in Ghana. It also reviews both the underlying theories, and empirical findings on the corruption-FDI relationship. The data and methods used in this research are described in detail in chapter three. Chapter four discusses the key findings of the study. Finally, chapter five concludes the paper by summarizing the key findings, offering recommendations to stakeholders, and future research.

## CHAPTER TWO: LITERATURE REVIEW

This chapter comprises two main sections, namely, the theoretical review and empirical review. In the theoretical review section, the theories underlying the study of corruption and foreign direct investment are reviewed. Additionally, an overview of both corruption and foreign direct investment inflow in Ghana is provided. It further discusses the findings from empirical works that study the relationship between corruption and foreign direct investment inflow.

### 2.1 Theoretical Review

Two alternating theories underlie the impact of corruption on foreign direct investment inflow to a country. These are the “grabbing hand” and the “helping hand” theories. The former posits that corruption increases the cost of transactions and thus reduces the investors' profit, hence serving as sand in the wheels of commerce (Wei, 1997). On the other hand, the proponents of the “helping hand” theory argue that corruption makes doing business in a country easier. Especially in countries where institutions do not work effectively, a bribe is a medium through which investors can expedite processes, hence serving as “grease in the wheels of commerce’ (Zangina & Hassan, 2020).

Sheifer and Vishny (1993) provide a framework that illustrates both theories. They classify corruption into two types, namely, corruption with theft and corruption without theft. In the case of corruption without theft, an official who has the power to restrict the supply of government goods can decide to sell at the government price plus his bribe, keep the addition and return the actual price to the government. In this case, the cost of acquiring the good is higher than its actual price, thereby increasing the cost

incurred by the investor in procuring the good. In the second case, corruption with theft, the official gives nothing to the government. Instead, he steals the goods and keeps everything after sales. In this case, it is at his discretion to charge any price and most likely chooses a lower price than the government price because, if sold at the market price or above it, investors would rather purchase from the market. Investors benefit from corruption with theft because they can obtain goods at lower prices relative to the market prices, hence, enjoying higher profits from their investments.

The corruption without theft explains the grabbing hand theory in that FDI firms who face this kind of corruption have to purchase goods at prices higher than the actual market prices. This increases their transaction costs and consequently reduces the profit that flows from doing business in the country. This kind of corruption, all other things being equal, will discourage investors. Conversely, the corruption with theft provides an incentive for investment as investors can get goods at prices lower than the actual market price, leading to a higher profit for investors. Because firms generally want to maximize profits and given that corruption provides the opportunity to purchase goods at prices lower than the market prices, such kind of corruption is attractive to them, hence, illustrating the helping hand theory of corruption.

Wei (1997) provides a model for the study of corruption and FDI relationship, which illustrates the grabbing hand theory. In this model, a foreign firm's profit function is given as,  $\pi = (1-q)(fx) - cx$ , where  $q$  is the random corruption level with mean  $\mu$  and variance or uncertainty,  $\sigma^2$ .  $(fx)$  is a twice differentiable and a weakly concave production function of the firm. The cost of investment is denoted by  $cx$ . In this function, as the level of corruption (bribery rate) increases, the profit accrued from investment decreases. He

shows that when there is no uncertainty ( $\sigma^2=0$ ), the impact of corruption will be just like a distortionary tax. However, corruption usually induces uncertainty. As the corruption-induced uncertainty increases, the function shows that the profit from investing in those countries declines, and the impact is more than distortionary tax. Given that investors aim to maximize their utility (profit), as corruption and its induced uncertainty increases, other things equal, investors will reduce their investments.

The grabbing hand theory has been criticized as being based on unrealistic assumptions. Leff (1964) argues that the grabbing hand hypothesis is based on the assumption that governments have good intentions to promote economic growth. In this case, they would create a conducive environment for investments, and therefore, corruption would interfere negatively. He, however, argues that governments have other motives that they may prioritize over economic development such as, strengthening their military, clinging on to power, etc.

Contrary to the grabbing hand hypothesis, Leff (1964) provides an alternative theory. He provides three major ways through which corruption promotes the activities of FDI firms, and these are; hedging against bad economic policies, encouraging innovation, and promoting efficiency. He argues that firms can bribe governments to prevent unfavorable decisions. In contrast to Wei (1997), Leff (1964) argues that corruption reduces uncertainty in the market as bribes hedge against such sudden and unfavourable economic policies. He further argues that new foreign firms may not survive in some markets with already well-established firms. So, they resort to paying officials to protect their investments.

Additionally, licenses and favors are in limited supply; therefore, they only go to the highest bidders. These highest bidders are firms that are efficient in production. Consequently, corruption allows contracts to be awarded to the most efficient firms. He further argues that corruption favors foreign firms, and therefore, as the corruption level rises, the foreign investment rate also goes up. However, it is argued that firms that pay the highest bribes may be successful rent-seekers and not necessarily efficient firms (Tanzi & Davoodi, 1997; Tanzi, 1998).

Similarly, Lui (1985) uses the queuing model to explain the helping hand theory. In his model, customers in a queue for a service choose to pay a bribe to the server depending on the value they attribute to time spent in the queue. People who pay bribe  $x$  will be placed in a position in the queue in front of those who pay bribe  $x' \leq x$  but will be behind those who pay  $x'' \geq x$ . Consequently, the amount of bribe that a person will pay depends on the value the person places on the speed of service that will be gained from paying the bribe. More people will pay a bribe if the server (the person rendering the service) expedites the process for those who pay. However, if the process is too quick, the cost of being in the queue will be lower than the cost of a bribe. Therefore, for the server to increase his bribery revenue, he expedites the process to an optimum level. In relation to the FDI firms, bribe allows them to expedite transaction processes in bureaucratic institutions. Because the bribe is paid according to the firm's value for the time saved, those who attribute the highest value will pay the highest bribe and receive their service, ensuring efficient allocation of resources.

Finally, Beck and Maher (1986) model a commission transaction bribery in the context of government procurement and compares it to competitive bidding. In this

model, firms are assumed to know their profits, costs, and government contract price. However, they have no information about their competitor's profit, costs, or the amount of bribe they pay to the government. The model shows that the amount of tax paid is a markdown on their profits so that firms with the highest profits obtain the contract by paying higher bribes. They show again that bribe works in the same way as competitive bidding in which firms offer discounts as a markdown on their profits. This shows that though bribes may raise the cost of transactions, the cost does not exceed their profits. Rather, a bribe is an alternative to bidding for contracts so that firms that are efficient in production win more contracts by offering higher bribes.

## **2.2 Empirical Review**

This section provides an overview of corruption and an overview of foreign direct investment in Ghana. It also reviews studies that seek to investigate the relationship between corruption and foreign direct investments inflow. The review of existing literature is further divided into studies that support the helping hand theory, studies that support the grabbing hand theory, and studies that find no significant relationship between corruption and foreign direct investment.

### **2.2.1 Overview of Foreign Direct Investment Inflow in Ghana**

Foreign direct investment inflow in Ghana has received massive attention in recent years, especially after 2005. Prior to 2005, Ghana experienced very low FDI inflow. For example, in 1976 and 1979, net FDI inflow was -18,269, 970 dollars and -2,800,000 US dollars, respectively. Beyond 2005, FDI inflow has been increasing. The change in FDI trend could be attributed to the political stability in Ghana as the country transitioned from autocratic to democratic government and good investment policies such



as the Economic Recovery Programme, Agenda 2020, among others (UNCTAD, 2003).

FDI reached an all-time high in 2016 with a total inflow of 3.485 billion US dollars.

However, FDI has been declining since 2016.

Foreign direct investment in Ghana flows from diverse sources, including the USA, United Kingdom, and Denmark. However, Asian countries are the major sources of foreign direct investment in Ghana, particularly China and India (Yeboah & Anning, 2020).

From 2013 to 2018, the total FDI registered projects in Ghana totaled 1,312. Of these projects, 946 are wholly foreign-owned projects, with joint ventures making up the remaining 366 projects (Yeboah & Anning, 2020). These projects together created employment for 159,764 people, with 84.6% and 15.45% of the total people employed being Ghanaians and expatriates, respectively (Yeboah & Anning, 2020).

The service and the manufacturing sectors are the highest recipients of foreign direct investments. Tourism and the Agricultural sectors are the most minor recipients of foreign direct investments in Ghana (*see table 1 below*).

Table 1

*Sectoral Distribution of Registered FDI Projects and their Estimated Total Cost from 2013 to 2017*

<b>Sectors</b>	<b>Number of Projects</b>	<b>Estimated cost in \$USM</b>
Agricultural	29	210.46
Building & Const	120	2,378.92
Export Trade	35	59.12
General Trading	194	638.04
Liaison	134	1,468.67
Manufacturing	252	5,223.44
Service	346	5,530.02
Tourism	31	696.71

Source: Yeboah and Anning, 2020. Table 4. Sectorial Distribution of Registered FDI Projects and their Cost from 2013 to 2017.

The table shows that the service sector with 346 registered FDI projects costing a total of USD5,530.02 million dollars received most of the FDI from 2013 to 2017. The manufacturing sector follows with 252 registered projects at an estimated total cost of USD5,223.44 million dollars. Agriculture is at the bottom, with 29 registered projects costing a total of USD210.46 million dollars. It is followed by the tourism sector with 31 registered projects with a total cost of USD696.71 million dollars. However, the export trade sector is the least when only the total cost is considered.

It is worth noting that the FDI that flows into the country is not evenly distributed among the country's regions. From 1994 to 2013, the Greater Accra region received the highest FDI (58%). It is followed by the Western region (15%), then the Ashanti region (11%). All other regions collectively received only 5% of the total FDI from 1994 to 2013 (Yeboah, 2018).

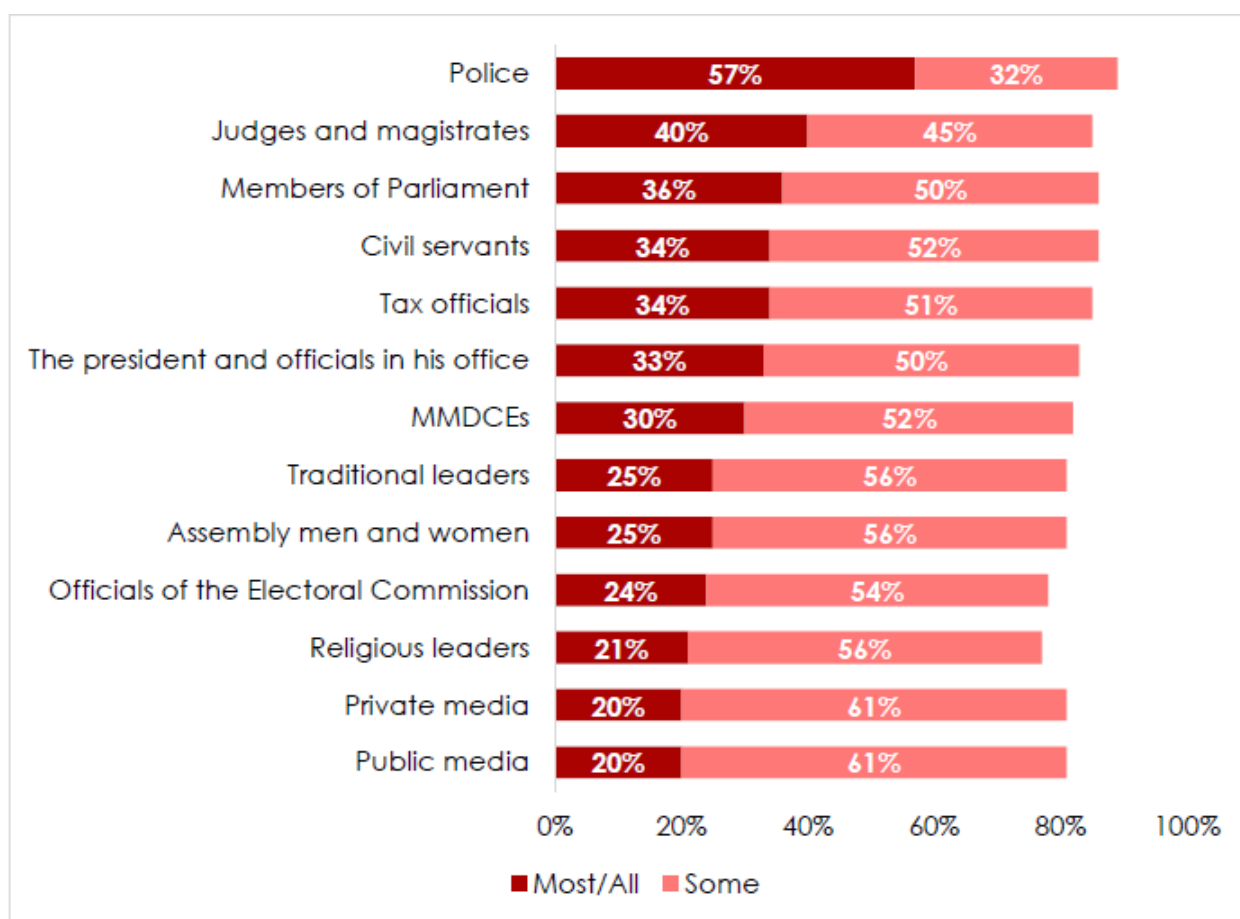
### **2.2.2 Overview of Corruption in Ghana**

Corruption in Ghana is very pervasive. Transparency International's corruption perception index has, over time, shown this fact. Since 1998, the country has never scored half of the score. From 1998 to 2011, the country's average score was approximately 3.6 out of a total of ten. From 2012 to 2019, the country's score averages 44%, reaching its all-time high of 48% in 2014.

Also, compared to the rest of the world, the country's corruption level has been worsening. In 2016, the country lost 14 positions from its previous year's position (Transparency International, 2019). In 2017 and 2019, it experienced position changes of -11 and -2, respectively (Transparency International, 2019). This reflects a comparative improvement in the corruption level of other countries and the worsening situation of

Ghana's corruption. It also implies that the corruption situation is being managed poorly in Ghana.

Unfortunately, corruption is more pronounced in the institutions that make and implement laws in the country. The 2019 Afrobarometer dispatch indicates that the police, judges, magistrates, and members of parliament are the most corrupt people in the country (Osse & Norviewu, 2019). On the other hand, the religious leaders and the media are perceived to be the least corrupt in Ghana (See *figure 3*).



**Respondents were asked:** How many of the following people do you think are involved in corruption, or haven't you heard enough about them to say?

*Figure 3.* Who is perceived to be corrupt in Ghana?

Source: Osse & Norviewu, (2019). Figure 1– Who is Corrupt in Ghana?

As shown in the figure, 57% of the survey respondents perceived all or most of the police to be corrupt. Most Judges and magistrates, members of parliament, are perceived by 40% and 36% of the respondents to be corrupt. Many of the respondents indicate that some officials are corrupt, but not every official is involved in corruption.

To combat the problem of corruption, the government of Ghana set up the special prosecutor's office, an independent body responsible for prosecuting corrupt officials. However, the office has not made significant impact due to some bottlenecks such as "disregard of statutory requests made by the office for information and production of documents to assist in the investigation of corruption and corruption-related offenses" (Amidu, 2019, p. 2). Other impediments to the effective discharge of the duty of the office are concurrent investigation by other institutions into cases the office is mandated to investigate and failure to punish offenders who have been charged and arraigned before the law courts (Amidu, 2019).

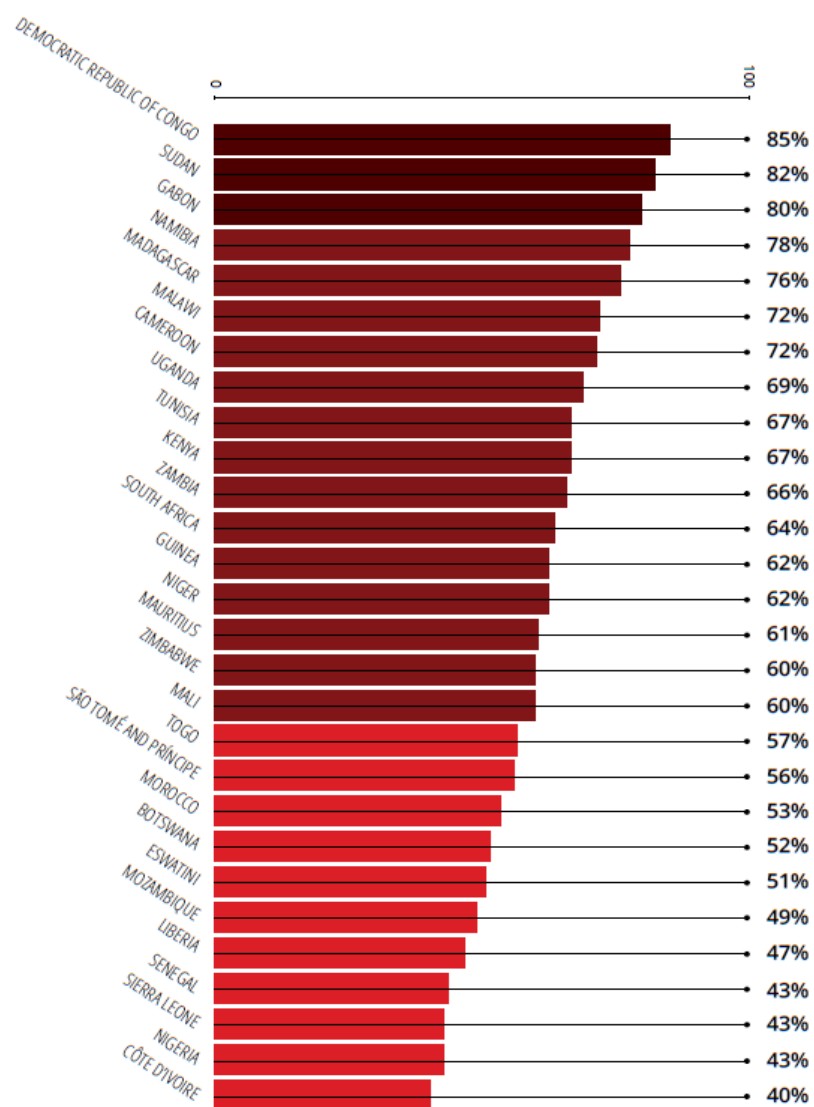
### **2.2.3 Corruption in Africa- Where is Ghana Standing?**

Corruption is not just a Ghanaian problem but a problem in the whole of Africa. While some countries have made strides in the fight against corruption, most African countries are still lagging.

In the 2015 Afrobarometer survey, 58% of survey participants perceive an increase in corruption in Africa. The top three countries that showed the most perceived reduction in corruption are Burkina Faso (28% perceive corruption increased over the past year), Mali (31% perceive corruption increased over the past year), and Cote D'Ivoire (32% perceive corruption increased over the past year). The three worst performers are South Africa, Ghana, and Nigeria, with 83%, 76%, and 75% of respondents

perceiving an increase in corruption in these countries, respectively. It is worth noting that Ghana is the second-highest country in Africa in terms of perceived rise in corruption as at 2015.

There has been much improvement for most countries in controlling corruption. In the 2019 Afrobarometer survey, the percentage of people perceiving a rise in Africa's corruption reduced from 58% in 2015 to 55% in 2019. Some individual countries also made much improvement as shown in *figure 4* below.



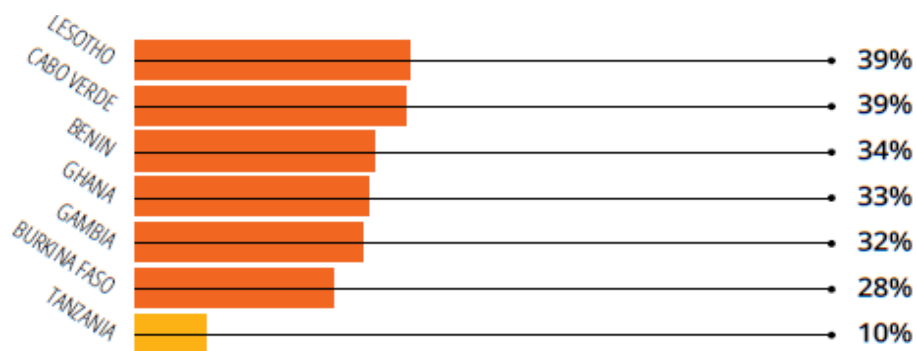


Figure 4. Perception of corruption increase in Africa.

Source: Pring (2019). Figure 1. Percentage of People who think corruption increased in the past 12 months. People and Corruption: Africa Survey.

The DRC, Sudan, and Gabon had the largest percentage of people (over 80%) perceiving that corruption increased in those countries. On the other hand, Tanzania, Burkina Faso, Gambia, and Ghana had the least people who perceive corruption increased. It is worth emphasizing, that Ghana is doing better than over 31 of the countries listed in *figure 4*. This is a significant improvement because Ghana was among the countries with the highest perceived rise in corruption as the 2015 survey showed.

On the African level, most people (59%) perceive that governments are doing poorly to control corruption. The situation however is different in Ghana as most people (about 60%) believe that the government of Ghana is doing well to put the corruption menace under control (Afrobarometer, 2019).

#### 2.2.4 Empirical Support for the Helping Hand Theory

Hines (1995), using a sample of 35 countries and data from 1966-1977 and 1977-1982 studied the impact of the US Foreign Corrupt Act in 1977. He applied the fixed effect regression model and finds that after the legislation, US firms invested less in countries with high levels of corruption. For other source countries, the level of

investment increased in countries with high levels of corruption but fast-growing economies. The findings imply that, before the 1977 legislation, US firms were paying bribes for investment in host countries, and the introduction of the legislation, which criminalizes this act, therefore, became an obstacle for the businesses. Thus, prior to the legislation, the host country's corruption encouraged US investors to invest.

The total FDI growth rate for the sampled countries incorporated into the model was computed by the author, while the FDI growth rate for the US was derived from the World Bank. Hines (1995) admits that these two variables may not be comparable because the World Bank's computation will be different and more precise than the author's computation. This, consequently, might have limited the quality of the study.

In addition, Egger and Winner (2005) studied the effect of corruption on FDI with 73 sample developed and less developed countries over the period 1995-1999. The study provides strong evidence for the helping hand hypothesis of corruption. In both the short and long run, corruption has a clear positive impact on foreign direct investment inflow.

Also, with a sample of 53 African countries and data from 1995 to 2012, Quazi *et al.* (2014) estimated the impact of corruption on FDI in Africa using the dynamic system generalized method of moments. The study showed that there is a significant positive relationship between corruption and FDI in Africa. One major difficulty encountered in the study was that, for most of the sample countries, corruption indices did not vary much from year to year, so the authors had to modify the indices as a time-invariant variable. That is, they computed the average value of each country over the period.

Another study evidencing the helping hand theory is Omodero (2019). He regressed FDI on corruption using sample time series data from 1996 to 2017 in Nigeria.

He incorporates two measures of corruption into the model, which are the Nigerian corruption index and the corruption perception index. The study finds a significant positive relationship between the corruption perception index and foreign direct investment. However, the positive relationship between the Nigerian corruption index and FDI was insignificant.

### **2.2.5 Empirical Support for the Grabbing Hand Theory**

Wei (1997) studied the effect of uncertainty caused by corruption in host countries on FDI inflow by applying the ordinary least squares multiple regression on fourteen source countries and forty-one destination countries. The corruption-induced uncertainty indicator was based on the World Economic Forum's 1997 Global Competitiveness Survey with a large number of respondents of 2381. The results show that a host county's corruption-induced arbitrariness has a significant negative impact on the host county's FDI inflow. Wei (1997) further helps to draw a comparison between the effect of corruption on tax and FDI. For example, he shows that the effect of increasing the level of corruption-induced uncertainty from 0.64 to 1.75 is equivalent to the effect of increasing the tax level by 54%. Thus, this implies that corruption has worse effect on FDI than tax.

Cuervo-Cazurra (2007) used the double-log model with a quasi-fixed-effect similar to Wei (2000) on selected transitioning economies. The results show that corruption impacts FDI negatively. However, dividing corruption into different types showed that pervasive corruption (corruption with certainty) impacts FDI negatively. But the effect is insignificant for arbitrary (uncertain) corruption because it only becomes part



of the uncertainty associated with everyday operations. This is contrary to Wei (1997), which finds that corruption induced-uncertainty affects FDI negatively.

Wei (2000) also reinforces the findings of Wei (1997) that corruption is negatively correlated with FDI. In this study, he uses a quasi-fixed-effect regression model with twelve source countries and forty-five host countries. This study differs from Wei (1997) by the sample countries used. In this study, the source countries were reduced from fourteen to twelve while the host countries were increased from forty-one to forty-five. The study finds a significant negative relationship between corruption and FDI inflow, thus, supporting the theory that the host country's corruption level negatively affects FDI inflow to a destination country. However, the study results might have been influenced negatively by the data range used. It used corruption, and FDI data averaged over three years, which may be too short a period, hence affecting the generalizability of the findings.

Moreover, Al-Sadiq (2009) studied the effect of host country corruption level on the inflow of FDI with a sample of 117 host countries and data over the period 1984-2004. The study employed two different approaches. First, ordinary least squares (OLS) cross-sectional regression for 117 countries was performed to confirm the findings of other studies that had relied on the OLS cross-country analysis. Then, it employed the panel data approach to investigate whether or not there would be a significant difference in the findings. The results from the OLS cross-section approach showed a significant negative relationship between corruption and FDI inflow, hence confirming the findings of (Wei, 1997; Wei, 2000). The result indicated that a percentage increase in corruption level results in a 20 percent decline in FDI inflow. The result from the panel data

approach also showed a significant negative correlation between corruption and FDI, but the result is only significant when high-income countries such as the OECD countries are excluded; otherwise, it is insignificant.

The main difference between the cross-section approach and the panel data approach that prompted the need for both to be employed is that the latter allows the researcher to control for the unobserved country-specific effect, which may be correlated with the other explanatory variables, but with the former, this cannot be done. When the study controlled for the quality of institutions variable in the model, the relationship became insignificantly positive. This reveals that the methodologies employed in estimating the relationship between corruption and FDI inflow may impact the results.

Additionally, Castro and Nunes (2013) investigate the impact of corruption on FDI in 73 countries and find that the least corrupt countries receive more FDI, and therefore, controlling corruption in a host country will significantly lead to increases in foreign direct investment inflow. The study applied the generalized least squares regression model on sample data from 1998-2008. The countries used comprises emerging, developing, and developed economies. Also, variables such as inflation, GDP growth, secondary enrollment, tax rate, trade openness were combined to create a single variable called economic factor, while variables such as the absence of terrorism, rule of law, business freedom, political stability, and government stability were combined to create a single variable called political factor.

Furthermore, Belgibayeva and Plekhanov (2015) conducted a cross-country study with 226 sampled countries from 1992 to 2011. The study aimed to find out whether corruption matters to the FDI source country. The study used multiple linear regression

based on the gravity model of FDI. The result shows that as corruption in a host country is controlled, foreign direct investment flows more from clean (countries with a low level of corruption) countries. For source countries with high corruption incidence, improvement in the control of corruption in a host country only increases FDI by a small margin. For some countries, the study showed that as control of corruption improves, the level of investment declines. This study provides the insight that FDI's response to changes in corruption level is not homogenous from country to country. Rather, it responds at different rates to the changes in corruption for different countries. The findings of this study reconcile the varying findings from different studies on the topic in which some studies find no significant impact, others find positive impacts, and others find negative impacts.

Additionally, Epaphra & Massawe (2017) studied the effect of corruption on FDI in East Africa with a sample of 5 East African countries using data from 1996 to 2015. The study relied on the fixed effect panel data regression model based on the methodology of Al-Sadiq (2009). In both studies, the dependent variable was FDI per capita (FDI/Population). The study differs from that of Al-Sadiq because it incorporates two different corruption indices into the model, which are the corruption perceptions index and the control of corruption, to investigate whether the kind of corruption variable used will show different results. This is similar to Omodero (2018), which incorporates the corruption perception index and the Nigerian corruption index. To avoid the problem of multicollinearity, eight different panel models were developed with only one independent governance indicator variable in each. The findings show a negative

relationship between corruption and FDI, whether corruption perceptions index or control of corruption is used as the proxy for corruption.

Most of the studies have assumed a linear relationship between corruption and FDI. However, Zangina and Hassan (2020) used the nonlinear autoregressive distributed lag to estimate the impact of controlling corruption in Nigeria. The sample data covers the period 1984 to 2017. It showed that corruption is negatively correlated with FDI. As control of corruption improves, FDI significantly increases. However, when control of corruption reduces, there is an insignificant negative effect on FDI. This study differs from Omodero (2019) as this study uses a nonlinear approach on a wider range of sample data.

#### **2.2.6 Studies that find no significant Impact of Corruption on FDI Inflow**

Though most of the studies support either the grabbing hand or the helping hand hypothesis, a few differ. Wheeler and Mody (1992) studied how corruption affects FDI using US multinationals. The results from panel fixed-effect technique showed an insignificant relationship between corruption and FDI. The study has been highly criticized. Wei (2000, pp. 8) argues that “the insignificant result may be due to a high noise-to-signal ratio in the composite indicator.” They combined several variables to create a single variable named “RISK,” which may have caused the noise.

Cleeve (2012) also studied the impact of institutional qualities on FDI with 40 Sub-Saharan African (SSA) countries using the multiple linear regression over the period 1988-2008. The result corroborated no significant impact of corruption on FDI. The empirical validity of the study is questionable since the study relied on the International Country Risk Guide (ICRG) data by the Political Risk Services Group. Torrez (2002)

argues that the ICRG data may be of low quality and biased partly because of its 0 to 6 range instead of the common 0 to 10 range.

Additionally, Anyanwu (2012) studied the factors that influence FDI inflow in Africa with sample data over the 1996-2008 period on 53 African countries. He first uses the OLS technique, then uses the feasible generalized least squares method. He tests for heteroscedasticity, autocorrelation and performs two robustness checks. He finds that there is no statistically significant impact of corruption on FDI.

Again, Okafor (2015) used panel data from 1996 to 2010 to study the determinants of US FDI into 23 sub-Saharan African countries. The results from linear regression analysis showed that corruption has a negative but insignificant impact on FDI inflow. Though different in estimation techniques, this finding is consistent with Anyanwu (2012).

Finally, Hakkala *et al.* (2008) segregated FDI into vertical and horizontal and, using a log-linear gravity regression model, estimated the impact of corruption on FDI in Sweden. It was found that, in general, corruption has no significant impact on FDI. However, when tested separately, there is a significant negative impact on horizontal FDI, while no impact is observed for vertical FDI.

### **2.3 Conclusion**

The literature reviewed above shows that there may be a linear relationship between corruption and FDI. Generally, the corruption and FDI relationship may be positive, negative, or insignificant. It also shows that the relationship between corruption and FDI may depend on whether FDI is vertical or horizontal. The result may also depend on the corruption indices used to proxy corruption.

## CHAPTER THREE: METHODOLOGY

The study seeks to find the relationship between corruption and foreign direct investment in Ghana. In this section, a detailed description of the method employed in the study is provided. It also discusses the empirical model, provides a description of and justification for the variables used, discusses the study's validity, and finally reports the limitations in the methodology.

### 3.1 Research Design

The study adopts a quantitative approach in estimating the relationship between corruption and FDI inflow in Ghana and how this relationship was affected by the 2008 financial crisis. It applies the autoregressive distributed lag model on time series data, and it will be estimated via the OLS. The R programming software will be used for the data analysis.

#### 3.1.1 Hypothesis

As shown in the literature review, there is the helping hand theory, which postulates a positive relationship between corruption and FDI inflow (Leff, 1964; Lui, 1985). In contrast, there is the grabbing hand theory that posits that there is a negative relationship between corruption and FDI inflow (Wei, 1997). Both sides of the argument have found empirical evidence to support their hypothesis, as the empirical review section has shown in chapter two. In this study, it is expected that there will be a relationship between corruption and FDI, as found in most studies. In addition, it is expected that, the 2008 financial crisis affected the corruption-FDI relationship.

- Hypothesis 1

$H_0$ : Corruption has no effect on foreign direct investment inflow in Ghana.

$H_1$ : Corruption affects foreign direct investment inflow in Ghana.

- Hypothesis 2

$H_0$ : The 2008 financial crisis did not have any effect on the FDI inflow.

$H_1$ : The 2008 financial crisis affected the FDI inflow in Ghana

### 3.2 Econometric Approach

The study uses the autoregressive distributed lag model similar to Zangina and Hassan (2020). However, this study differs in terms of the control variables as this study uses more control variables than Zangina and Hassan (2020). It also uses more recent data and applies to a different country.

FDI inflow may not only be affected by the present level of corruption but also the corruption level in the past years. Also, foreign investors who are less knowledgeable about a country's economic environment would be attracted to countries with many foreign firms since it gives the idea that the country is safe for investment (Anyanmu, 2012). This implies that FDI inflow in the past is a contributing factor to the present FDI inflow. In such an instance, using the static OLS estimator may cause the error term to be correlated with the independent variables and may not give the best result (Wooldridge, 2009). A more appropriate model to use in this case is the autoregressive distributed lag because it considers the effect of past corruption on FDI as well as past FDI on current FDI inflow. As a result, the lags of both FDI and corruption are included.

Below is the autoregressive distributed lag estimator employed in this study:

$$\begin{aligned}
 FDI_t = & \beta_0 + \delta_1 FDI_{t-1} + \delta_2 FDI_{t-2} + \beta_1 Corruption_t + \beta_2 Corruption_{t-1} + \\
 & \beta_3 RGDP_{t-1} + \beta_4 ExchRate_t + \beta_5 Openness_t + \beta_6 INF_t + \beta_7 Govern_t + \\
 & \beta_8 Crisis_t + \varepsilon_t.
 \end{aligned}$$

Where  $FDI_t$  is the foreign direct investment inflow at any given time  $t$  from 1980 to 2019,  $FDI_{t-1}$  and  $FDI_{t-2}$ , are the first and second lags of foreign direct investment inflow, respectively.  $Corruption_t$  is the corruption perceptions index and  $Corruption_{t-1}$ , is the first lag of corruption.  $RGDPPC_t$  is real per capita gross domestic product,  $ExchRate_t$  is the official exchange rate,  $Openness_t$  is the trade openness,  $INF_t$  is the inflation rate (GDP deflator),  $Govern_t$  is the government effectiveness.  $Crisis_t$  is a dummy variable for the 2008 financial crisis, with 0 representing the period before the financial crisis (benchmark period) and 1 representing the period after the crisis. This variable helps to determine whether or not the 2008 financial crisis affected the corruption-FDI relationship in Ghana.

The parameters  $\delta_1$  and  $\delta_2$  are the coefficients of the lagged values of FDI. These coefficients tell the effect of changes in the lags of FDI on FDI inflow. The parameters  $\beta_1$  to  $\beta_8$  are the coefficients of the independent variables excluding the lags of FDI.

The parameters of most interest in this study are  $\beta_1$ ,  $\beta_2$ , and  $\beta_8$ , which are the coefficients of the present corruption, lag of corruption, and the 2008 financial crisis, respectively. The  $\beta_8$  gives the difference between the before-2008 financial crisis FDI and the after-2008 financial crisis FDI inflows.

The term  $\varepsilon_t$  is the error term at a given time  $t$ . It contains the other factors that affect FDI inflow but are not included in the model. It is assumed that  $\varepsilon_t$  has an expected value of zero given any value of the independent variables and uncorrelated with any of the independent variables.

The function specified above is transformed into the logarithmic form. The logarithmic function allows interpretation of the coefficients of the variables as



percentages. It also gives the additional advantage of getting variables with outliers to approach normality. In effect, all variables (excluding the dummy) is now transformed into a logarithmic form, as shown below.

$$\begin{aligned} \log(FDI_t) = & \beta_0 + \delta_1 \log(FDI_{t-1}) + \delta_2 \log(FDI_{t-2}) + \beta_1 \log(Corruption_t) + \\ & \beta_2 \log(Corruption_{t-1}) + \beta_3 \log(RGDPPC_t) + \beta_4 \log(ExchRate_t) + \beta_5 \log(Trade_t) + \\ & \beta_6 \log(INF_t) + \beta_7 \log(Govern_t) + B_8 Crisis_t + u_t \end{aligned}$$

Where  $\log(.)$  denotes the natural logarithm.

### 3.2.1 Rationale for the Control Variables Employed

The choice of the control variables included in this study is informed by other empirical studies, most of which are reviewed in chapter 2.

The inflation variable is an important determinant of FDI inflow. All other things being equal, FDI will flow more into countries with stable inflation since it implies lower uncertainty in the economy (Nunes & Castro, 2013).

When there is a high level of openness to trade, firms will find it easier to enter the market with their goods, hence inviting more firms into the country. Also, openness to trade has the benefit of giving access to a larger market since firms can export goods into and import inputs from markets outside the host country (Castro & Nunes, 2013). Additionally, open economies pursue policies that seek the welfare of businesses. This perception invites more FDI into the country (Epaphra & Massawe, 2017).

The exchange rate is used as a proxy for the strength of the domestic economy's currency. Investors find it favourable if the host economy's currency is weaker relative to that of the investor's (Okafor, 2015). Low cost of borrowing is one of the benefits of a weaker currency which induces investors to invest in a host economy (Okafor, 2015).

The government effectiveness indicates the effectiveness of policy formulation and implementations, the effectiveness of the public service, and the quality of bureaucracy in the host country (Epaphra & Massawe, 2017).

Per capita GDP is used to proxy the market size or the market potential of the host countries. A larger market size implies that the people would demand many goods and services, making the country attractive to foreign investors (Epaphra & Massawe, 2017). Also, host countries with a large market size have the advantage of attracting more FDI because when firms situate near large markets, they reduce their transaction costs (Castro & Nunes, 2013).

### **3.3 Data Description**

The study relies on secondary data on corruption, FDI, and other independent variables serving as control variables. The sample data covers the period 1980-2019, providing forty observations.

The corruption perceptions index is sourced from Transparency International's (TI) database. The TI reports data on 198 countries and compares countries by assigning them a percentile rank in addition to their score. The index is calculated based on surveys from diverse sources, including the African Development Bank Country Policy and Institutional Assessment, Global Insights Country Risk Ratings, Economist Intelligence Unit Country Risk Guide, World Bank Country Policy and Institutional Assessment. Since the various sources use different scales, the TI standardizes the data, and then they find the averages of the standardized data to arrive at the CPI. Also, for reliability, countries with less than three sources of corruption data are excluded. The data have been reported since 1995 for most countries, but data on Ghana are not available for the first

three years. From 1995-2011, they scored countries from 0 (highly corrupt) to 10 (very clean). However, in 2012, they changed the scale to 0 (highly corrupt) to 100 (very clean). The change in the measurement scale has made the data from 1995-2011 incomparable to the data from 2012-2019. In this study, the decile rank is used so that data in all years are comparable.

Government effectiveness and the control of corruption data are sourced from the database of the World Governance Indicator (WDI), a World Bank project. The government effectiveness and the control of corruption are reported among other four governance indicators, namely, voice and accountability, political stability and absence of violence, regulatory quality, and rule of law. The governance effectiveness has a range of -2.5 (weak) to 2.5 (strong). The control of corruption is also within the range of -2.5 (highly corrupt) to 2.5 (clean or no corruption). The datasets are reported annually for over 200 developing, developed, and emerging economies from 1996-2019. They are constructed using surveys from diverse primary sources, including Afrobarometer, Global Competitiveness Report Survey, Economist Intelligence Unit, Political Risk Services, Reporters Without Borders, Global Integrity Report, among. The data from the primary sources are averaged to arrive at the Worldwide Governance Indicator's measure of the governance variables.

The real per capita GDP, trade openness, inflation (GDP deflator), exchange rate and FDI data are sourced from the World Bank's database. The data for all five variables are reported annually, and they cover the period from 1960 to 2019.

The FDI is computed as a summation of equity capital, earning reinvestment, and other capital. The FDI data from the World Bank may differ from other sources because the World Bank uses different classifications of economies, different sources, and different adjustment and disaggregation techniques (World Bank, 2020). The data are reported annually from 1970-2019 in a million US dollars. Data used for the computation of FDI is sourced from the IMF, UNCTAD, and official national sources.

### **3.4 Reliability and Validity of the Research**

This study applies the autoregressive distributed lag estimator in estimating the corruption-FDI relationship using time series data. The test is carried out under the following OLS and time series assumptions:

- The model is linear in parameter and weakly dependent
- There is no perfect correlation between the independent variables
- The variables are normally distributed
- The errors are normally distributed with zero conditional mean
- the time series process is stationary.

One problem usually encountered in OLS is omitted variable bias, which is the exclusion of an important variable that may correlate with any of the independent variables (Wooldridge, 2009). This could lead to the endogeneity problem (the correlation between the error term and the independent variables), which violates the zero conditional mean assumption (Wooldridge, 2009).

A simple way to avoid the omitted variable bias is to incorporate more independent variables (Wooldridge, 2009). As much as possible, a number of variables that are key in explaining the relationship between corruption and FDI have been included. Therefore, the omitted variable bias is unlikely to be encountered in the study.

Also, the no perfect correlation assumption could be violated in the presence of multicollinearity (Wooldridge, 2009). An independent variable that is highly correlated with another independent variable will have a high standard error, which will affect the statistical significance of the results if not corrected (Allen, 1997). First, a correlation matrix of the independent variables is inspected. Then, the value inflated factor (VIF) is carried out to test for the presence of multicollinearity.

As highlighted above, an important OLS assumption for time series is that there is no serial correlation. However, in time series, the errors in different times could be correlated, causing serial correlation (Wooldridge, 2009). In the autoregressive distributed lagged estimator, the error term could also be correlated with the lag of the dependent variable. The presence of serial correlation will be a violation of the zero conditional mean error assumption. Due to this, the Breusch-Godfrey test will be performed to test for serial correlation.

Furthermore, the stationarity assumption implies that the probability distribution of the time series is stable over time. The lack of stationarity would lead to unreliable results. Due to the possibility of non-stationarity, the Augmented Dickey-Fuller unit root test will be carried out to test for the stationarity of the series. If the test shows the presence of a unit root (absence of stationarity), it will be corrected by differencing.

### 3.5 Limitations

The data available on corruption in Ghana is very scanty. The data available at the most reliable sources of corruption, such as the World Bank's control of corruption and Transparency International's corruption perceptions index, covers a very short period. The corruption perception index only covers the period from 1995 to 2019, but data for 1995, 1996, and 1997 are not available for Ghana. The International Country Risk Guide's (ICRG) corruption index goes a bit further, covering the period from 1984 to 2019, but some authors have doubted the reliability of this data for studies (Torrez, 2002). Since the ICRG data has been found to provide different results from other corruption measures, this study ruled it out as an option. The corruption perceptions index is used as the proxy for corruption in line with Castro & Nunes (2013) and Omodero (2019).

The forty data points used in this study were arrived at by filling in the period for which data is unavailable (1980-1998) with the median scores of the data. Since missing values were filled in with the median scores, the regression is first run with the full dataset (1980-2019). Afterward, the regression is estimated again with the available dataset (1998-2019) to check if the results differ.

## CHAPTER FOUR: RESULTS

This chapter presents the findings of this research. The section answers the question posed in the earlier chapters through empirical analysis of the data. The study sought to establish the relationship that exists between corruption and foreign direct investment inflow in Ghana. The chapter begins with a preliminary analysis of the data, and then it continues to discuss the research findings that are key to answering the research question.

### 4.1 Descriptive Statistics

Table 5 presents the descriptive statistics of the variables included in the regression analysis. It reports the mean, median, standard deviation, observation, minimum, and maximum data values.

Table 2

*Descriptive Statistics of Variables Used for the research*

Variable	Obs.	Mean	Std. Dev.	Median	Min	Max
FDI (in million)	40	999.10	1363	138	2.0	3485
Corruption	40	5.88	0.97	6	3	7
WBCorruption	40	52.68	3.26	52.88	43.9	59.33
RGDPPC	40	3122	994.4	2720	1992	5410
ExchRate	40	1.05	1.44	0.41	0	5.22
Openness(%)	40	62.9	28.05	67.64	6.32	116.05

INF	40	29.77	22.26	22.49	9.19	123.06
Govern	40	52.40	3.64	53.55	41.83	60.49
Crisis	40	0.28	0.45	0	0	1

Source: Author's computation using data from World Bank.

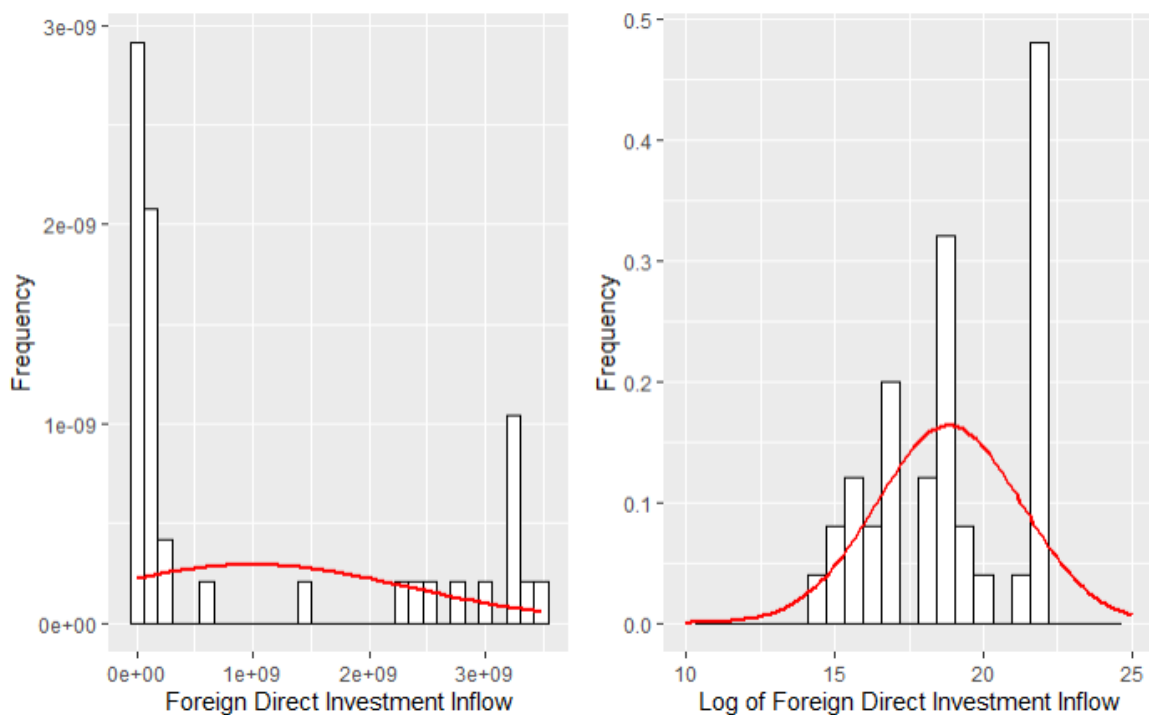
The descriptive statistics show the following about Ghana throughout 1980-2019: The foreign direct investments inflow averaged \$999.1 million with a stunning standard deviation of \$1,363million. With its mean and median wide apart, it could be inferred that the FDI data distribution is not evenly spread.

The average corruption (decile rank) of Ghana over the period is 5.88. The highest and minimum corruption decile ranks are 7 and 3, respectively.

Also notable is the real gross domestic product per capita (RGDPPC). Ghana's RGDPPC averages \$3122 with a standard deviation of \$994.4. The RGDPPC data is also skewed since its median value is quite far from its mean value.

Because some variables are not normally distributed, all variables (except the Crisis dummy) are transformed into logarithmic forms. This will make the data approach normality (See *figure 6*). The table shows the FDI distribution before and after the logarithmic transformation.





*Figure 5.* Normal Distribution curve of FDI and logFDI

Source: Author's derivation using data from the World Bank.

The diagram shows that before transforming it into logs, the FDI data was not evenly spread. However, after transforming the data into the logarithmic form, the data approaches normality. Because the logarithms help achieve normality in the data, all analysis henceforth is based on logarithms unless otherwise specified.

## 4.2 Preliminary Analysis

First, the dependent variable (FDI) graph and the decile rank of the corruption perception index are plotted individually to show the trend over time. Then, they are plotted together to show the correlation between them.

### 4.2.1 Trend in Foreign Direct Investment Inflow in Ghana

The graph below shows the trend in foreign direct investment inflow in Ghana from 1980 to 2019.

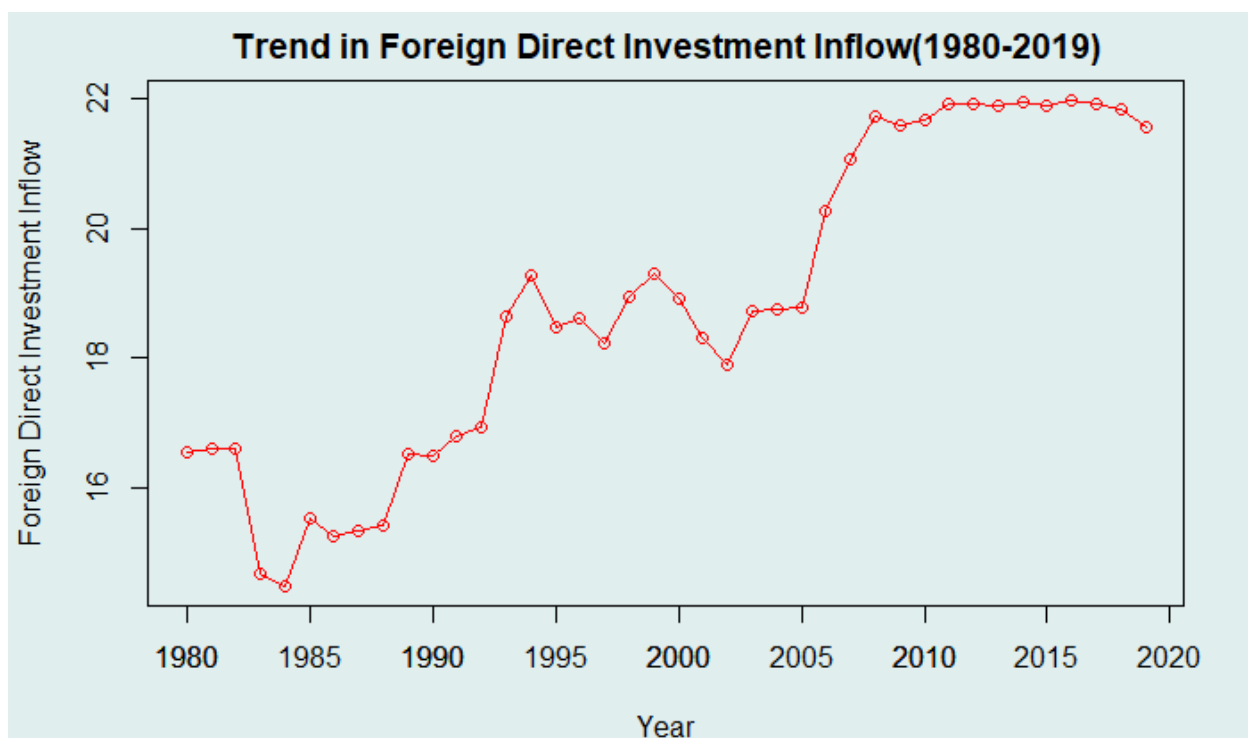


Figure 6. The trend in FDI Inflow(in logs) in Ghana from 1980 to 2019

Source: Author's derivation using data from World Bank.

The level of FDI inflow remained significantly low in the years between 1980 and 1990 compared to the years that proceed it. This is likely because, in these years, Ghana was focused more on the administrative system of economic management instead of a market economy (UNCTAD, 2003). The higher FDI inflow between 1993 and 2005 relative to previous years may have resulted from deliberate efforts to promote foreign direct investment such as the Ghana Investment Act, the Agenda 2020, among other programmes. Ghana has experienced some growth in FDI inflow since 2006, which could be attributable to its political stability and peace, making it attractive to foreign investors. After 2018, FDI has been decreasing, and the trend even shows that FDI will drop even further. The Covid-19 pandemic could be the main culprit for this decline in Ghana's FDI inflow.

#### 4.2.2 Trend in Corruption in Ghana

Figure 7 graph below shows Ghana's corruption trend (decile rank) from 1980 to 2019.

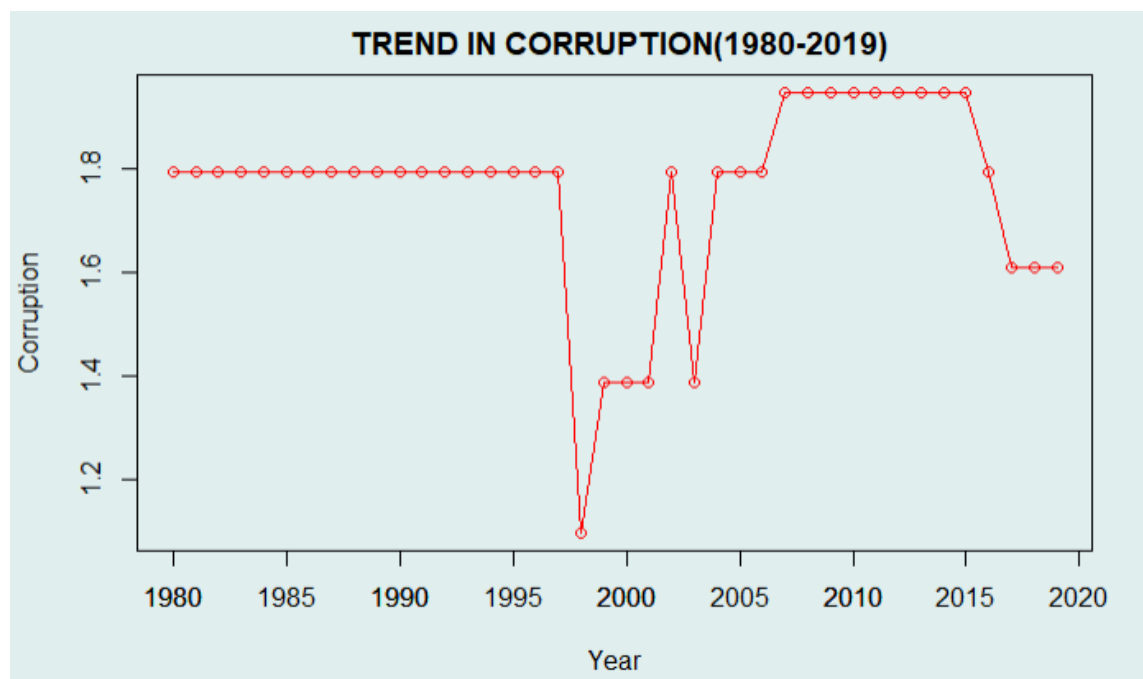


Figure 7. Graph Showing the Trend in Corruption (in logs) from 1980 to 2019

Source: Author's derivation using data from World Bank

The initial part of the graph (1980-1997) is observed to be flat. These are the years that were filled with the median score due to data unavailability. Between 1998 and 2003, the decile rank of corruption in Ghana was volatile. After 2003, Ghana's decile rank has been rising, marking an improvement in control of corruption. The greatest improvement in the level of corruption was in the period 2007-2015. After 2015, however, the decile rank of Ghana has been declining, signifying deterioration in the corruption control relative to other countries.

### 4.2.3 Correlation Between Corruption and Foreign Direct Investment Inflow

The graph below presents the correlation between corruption and FDI inflow.

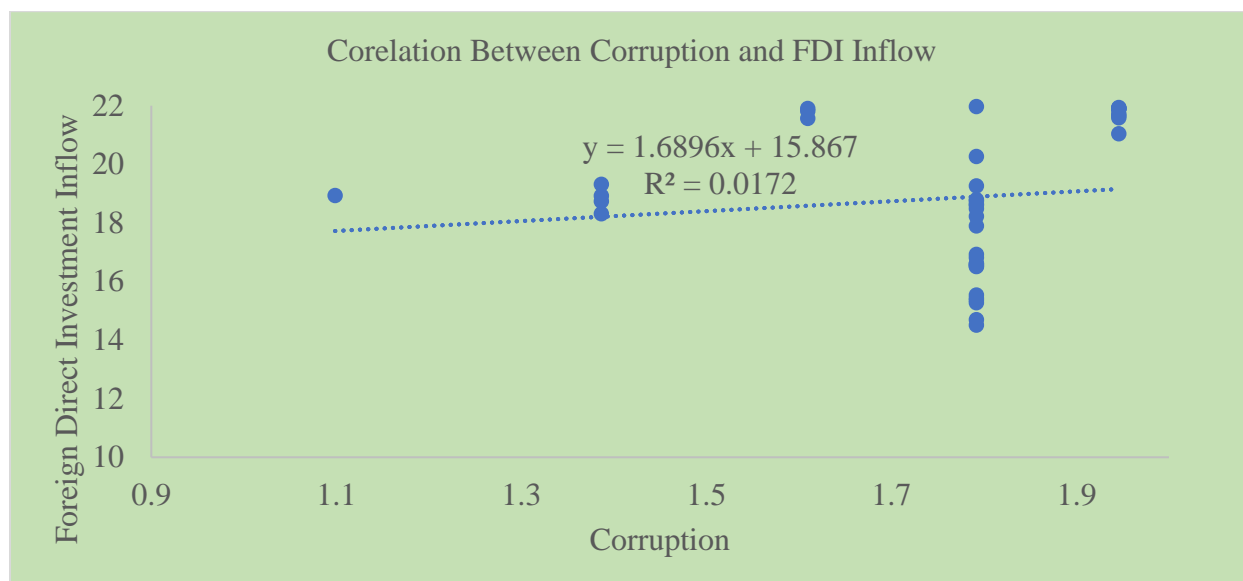


Figure 8. Correlation Between Corruption and logFDI Inflows in Ghana

Source: Author's derivation using data from World Bank

The graph shows that most of the data points are scattered away from the trend line. It passes only through few points. Also, it shows a positive correlation between corruption and FDI inflow. The relationship, however, is not strong. The  $R^2$  is only 0.017, suggesting that the linear model is not a good fit. The relationship between corruption and FDI inflow may not be linear, as suggested by (Castro & Nunes, 2013).

### 4.3 Test for Stationarity

Time series data gives invalid results in the presence of unit root. Any statistical estimation from nonstationary series will be misleading (Hanck, Arnold, Gerber, & Schmelzer, 2020). Hence, in this section, the Augmented Dickey-Fuller test is used to test for unit root (*see table 3*). The following are the hypothesis to be tested:

$H_0$ : The time series process not stationary

$H_1$ : The time series process is stationary.

Table 3

*Augmented Dickey-Fuller Unit Root Test Results*

Variables	Dickey-Fuller t-statistic	P-Value
Corruption	2.49	0.38
WBCorruption	2.63	0.33
FDI	2.10	0.53
RGDPPC	0.53	0.98
ExchRate	3.77	0.03
Openness	3.36	0.08
INF	4.91	0.01
Govern	0.78	0.96

Source: Author's computations using data from World Bank

As table 3 shows, for all variables, the p-values of the coefficients except *ExchRate* and *INF* are greater than 0.05. The *ExchRate* and *INF* with lower p-values less than 0.05 do not contain unit roots; hence they would not result in misleading regression results. Those with p-values higher than 0.05 are nonstationary time series data and need to be made stationary before any regression is run.

All the nonstationary variables are transformed into stationary variables through differencing. After the first differencing, *Openness* and *Govern* variables become stationary, but the rest do not. All the remaining variables become stationary with p-values less than 5% after taking the second difference (see Appendix A). Hence, the null hypothesis that the series is not stationary is rejected.

#### 4.4 Test for Multicollinearity

To ensure that the estimation does not suffer from omitted variable bias, as much as possible, variables deemed relevant in explaining the relationship between corruption and FDI inflow are included. But having many independent variables in the model could result in the problem of multicollinearity. A correlation matrix may give a hint on the presence of multicollinearity. Thus, a correlation matrix of the independent variables is inspected, as shown in table 4 below.

Table 4

*Correlation Matrix Between Independent Variables*

	Corruption	WBCorruption	RGDPPC	ExchRate	Openness	INF	Govern
Corruption	1.00						
WBCorruption	0.39	1.00					
RGDPPC	0.14	0.15	1.00				
ExchRate	-0.04	0.01	0.82	1.00			
Openness	-0.21	-0.13	0.52	0.86	1.00		
INF	0.08	0.08	-0.56	-0.61	-0.52	1.00	
Govern	0.06	0.28	-0.60	-0.39	-0.16	0.47	1.00

Source: Author's estimates using data from World Bank.

As seen in the table, none of the pairs has a perfect correlation between them. The highest correlation is between the pairs, Openness and ExchRate and ExchRate and RGDPPC, with 0.86 and 0.82 correlations, respectively. These are not perfect correlations. Hence, there is not enough reason to suspect multicollinearity.

To ensure the model is actually free from multicollinearity, the VIF test of multicollinearity is carried out (*see table 5*). This test can reveal the perfect correlation

between any pairs that the correlation matrix could not hint at. The first column shows the VIF score and the correlation tolerance level for each variable in the model with the corruption perceptions index (Corruption). The second column shows the VIF and tolerance level for the model with the control of corruption (WBCorruption) index.

Table 5

*VIF Test for Multicollinearity*

<b>Variable</b>	<b>VIF</b>	<b>Cor. Tolerance</b>	<b>Variable</b>	<b>VIF</b>	<b>Cor. Tolerance</b>
Corruption	2.42	0.41	WBCorruption	2.61	0.38
Corruption <sub>t-1</sub>	2.54	0.39	WBCorruption <sub>t-1</sub>	2.26	0.44
FDI <sub>t-1</sub>	1.82	0.55	FDI <sub>t-1</sub>	1.89	0.53
FDI <sub>t-2</sub>	1.50	0.66	FDI <sub>t-2</sub>	1.84	0.54
RGDPPC	1.44	0.69	RGDPPC	1.47	0.68
ExchRate	1.96	0.51	ExchRate	2.43	0.41
Openness	2.00	0.82	Openness	2.08	0.48
INF	1.95	0.51	INF	2.02	0.50
Govern	1.52	0.66	Govern	1.43	0.70
Crisis	1.08	0.92	Crisis	1.08	0.92

Data Source: Author's computations using data from World Bank

The highest VIF value in the model with the corruption perception index as the main independent variable is 2.54, while the highest in the model with the WBCorruption is 2.6. A VIF greater than 10 would mean a multicollinearity problem exists in the model, which would lead to a misleading estimate due to inflation of standard errors. In such a case, the variables exhibiting high correlation with other

variables would be removed. However, all the variables have VIF values less than 3, implying the absence of multicollinearity.

Also, the correlation will be tolerated if the tolerance level is less than 0.1. However, as seen in the table, none of the variables has a tolerance level less than 0.1. The least correlation tolerance level in both the first and the second models is 0.41. Hence, no cause for concern about multicollinearity. The absence of multicollinearity implies that all the variables could be included in the model.

#### 4.5 Regression Output

This section presents the results for all the regression estimates. The section also provides interpretation and findings that help achieve the study's objectives outlined in chapter one.

##### 4.5.1 What is the Relationship Between Corruption and FDI Inflow in Ghana?

To answer the above research question, the following hypothesis is tested:

- $H_0$ : Corruption has no effect on foreign direct investment inflow in Ghana.
- $H_1$ : Corruption affects foreign direct investment inflow in Ghana.

The corruption perceptions index (decile rank) is used as a proxy for the country's corruption level. The results from estimating this relationship are presented in table 6 below.

Table 6

*Regression Output from Estimating the Relationship Between Corruption and FDI*

Variable	Coefficient	Standard Error	T-Value	P-Value
Intercept	0.149	0.143	1.040	0.308



FDI <sub>t-1</sub>	-0.410	0.175	-2.351	0.027 *
FDI <sub>t-2</sub>	-0.432	0.159	-2.722	0.012 *
Corruption	-1.188	0.576	-2.061	0.049 *
Corruption <sub>t-1</sub>	-0.866	0.591	-1.466	0.155
RGDPPC	5.399	4.414	1.223	0.233
ExchRate	-0.2158	0.653	-0.331	0.7437
Openness	0.633	0.748	0.846	0.405
INF	0.144	0.147	0.980	0.336
Govern	0.724	1.510	0.479	0.636
Crisis	-0.330	0.247	-1.338	0.193
Multiple R-Squared		0.515		
Adjusted R-Squared		0.320		
F-Statistic		2.649		
P-Value of F-statistic		0.023		

Signif. codes: '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1

Source: Author's computation using data from World Bank.

The  $R^2$  shows that the model explains about 51.5% of the variations in the FDI inflow. Thus, the linear regression model is a good fit for the data. Also, the F-statistic shows that the overall result from the model is significant at the 5% significance level.

All the variables except the lags of FDI and corruption are statistically insignificant. The first and second lags of FDI have inverse relationships with the FDI

inflow. An increase in the first and second lags of FDI leads to a reduction in FDI inflow by 0.41% and 0.43%, respectively, and the results are significant at the 5% significance level. The results are quite unexpected since the agglomeration effect suggest that countries with more foreign firms will receive more FDI inflow. The results, however, shows that the so-called agglomeration effect does not exist in Ghana. Instead, foreign investors are less willing to invest in Ghana when many foreign firms are already present.

The coefficient of crisis dummy I negative which would imply that the years after the 2008 financial crisis received less FDI than the years before the crisis, but this result is statistically insignificant. Hence, failure to reject the null hypothesis that the 2008 financial crisis had no effect on the corruption-FDI relationship.

The coefficient of the corruption variable has a negative sign. The sign does not imply a negative relationship due to how the corruption perceptions index is interpreted (see Epaphra & Massawe, 2017; Castro & Nunes, 2013). A change in the corruption index from 1 to 2 does not imply an increase in corruption, but a decrease in corruption since the corruption perceptions index is from 1 (highly corrupt) to 100 (most clean or least corrupt). The results show that as Ghana moves from a highly corrupt to a cleaner country, FDI inflow decreases. So, there is a positive relationship between corruption and FDI inflow in Ghana. A 1% increase in corruption leads to a 1.19% increase in FDI inflow. The result is statistically significant at the 5% significance level. Hence, the null hypothesis that corruption has no effect on foreign direct investment inflow is rejected.

Variables such as real GDP per capita, trade openness, inflation, and governance effectiveness show positive signs, but the coefficients are statistically insignificant. Exchange rate shows a negative relationship, but the result is insignificant.

### 4.5.2 Joint F-Test on Corruption and Lag of Corruption

The regression results have shown that corruption<sub>t</sub> is significant, however, its lag is insignificant. A restricted version of the regression is re-run to test the joint significance of corruption and its lag.

The hypothesis specified below is to be tested:

- $H_0: \beta_1 = \beta_2 = 0$
- $H_1: \beta_1 \neq \beta_2 \neq 0$

The p-value from the estimate is 0.152. This means that the coefficients are insignificant, even at the 10% significance level. Corruption and its lag are, therefore, jointly insignificant. Hence, failure to reject the null hypothesis that the coefficients of corruption and its lag are jointly not different from zero.

### 4.5.3 Regression with the Available Dataset (1998-2019)

As discussed in chapter three, data on the corruption perceptions index is available only for the period 1998-2019. Therefore, to arrive at the forty data points (1980-2019), the missing values were filled in with the median decile rank. Perhaps filling in with median rank has influenced the results. Therefore, the regression is re-run with only the available dataset (1998-2019).

The regression shows the same results as the one with the dataset from 1980-2019 (presented in table 6). Like the first regression, all the independent variables are insignificant except the lags of FDI and corruption<sub>t</sub>. FDI lags are negatively related to FDI inflow by the same magnitude as the first regression. Also, corruption is positively related to FDI inflow, just as the first regression shows. Like the regression with the full

series, the result for the Crisis dummy used to estimate the impact of the 2008 financial crisis on the corruption-FDI relationship is insignificant.

Therefore, filling in the missing values by the median score did not produce results different from the available dataset. Hence, filling in the dataset with the median score does not render the study results invalid.

#### 4.5.4 Corruption-FDI Relationship: Result Dependent on Corruption Index Choice?

Regression estimates on the relationship between corruption and FDI have produced differing results. Some have found positive relationships, others find a negative relationship, and others even find no significant relationship. Using the World Bank's control of corruption as the proxy for corruption, the regression is re-estimated. The result from using the corruption perceptions index is compared to the results from using control of corruption. The output is shown in table 7 below.

Table 7

*Regression Output with Control of Corruption as Proxy for Corruption*

Variable	Coefficient	Standard Error	T-Value	P-Value
Intercept	0.121	0.151	0.804	0.429
FDI <sub>t-1</sub>	-0.521	0.188	-2.778	0.011 *
FDI <sub>t-2</sub>	-0.467	0.185	-2.525	0.018 *
WBCorruption	1.235	1.444	0.855	0.400
WBCorruption <sub>t-1</sub>	1.548	1.353	1.144	0.263
RGDPPC	7.232	4.691	1.542	0.136

ExchRate	-0.461	0.767	-0.602	0.553
Openness	0.575	0.804	0.715	0.481
INF	0.253	0.158	1.603	0.122
Govern	-0.238	1.548	-0.154	0.879
Crisis	-0.293	0.260	-1.126	0.271
Multiple R-Squared	0.461			
Adjusted R-Squared	0.245			
F-Statistic	2.136			
P-Value of F-statistic	0.060			

Significance codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1

Source: Author’s computation using data from World Bank.

As shown in the table, the results show that FDI lags have a negative relationship with the FDI inflow. A change in  $FDI_{t-1}$  and  $FDI_{t-2}$  leads to a reduction in FDI inflow by 0.52% and 0.47%, respectively. The result is significant at the 5% significance level. This is similar to the first model (the model with corruption perceptions index) in terms of the direction of the relationship but differs only by magnitude.

The control of corruption and its lag differ from the corruption perceptions index in terms of the relationship and statistical significance. Both the control of corruption and its lag have positive signs, implying that, when corruption is controlled, FDI flows more into the country. In other words, there is an inverse relationship between corruption and FDI. This result is insignificant. This result is different from the corruption perceptions index, which shows a significant positive relationship.

Also, the results for trade Openness, inflation, and government effectiveness, exchange rate, real GDP per capita, and the 2008 financial crisis are all insignificant, just as in the model with the corruption perceptions index.

In a nutshell, the corruption perceptions index and the control of corruption variables produce different results in terms of the significance of the results, the magnitude of the estimated coefficients, and the relationship between corruption and FDI. This could be due to differences in the methodology employed in creating these indices. The number of sources of primary data for the two indices. For example, in 2019, the corruption perceptions index was created using data from thirteen sources, while the control of corruption was created using data from fifteen sources. Factors like this could also be the cause of the differences in the results.

The finding that corruption perceptions index and the control of corruption produce different results is similar to Omodero (2018) who finds that the corruption perceptions index has positive relationship with FDI in Nigeria, but the Nigerian corruption index produces insignificant results. It however differs from Epaphra and Massawe (2017). They find that the corruption has significant negative relationship with FDI whether corruption perceptions index or control of corruption is used as the proxy for corruption. It is worth noting that the Omodero (2019) uses a time series study on a single country just like this study which have accounted for the similarity in results. On the other hand, Epaphra and Massawe (2017) used a different methodology, fixed effect panel studies. This might have accounted for differencing in results.

#### 4.6 Serial Correlation Test

In this section, the Breusch-Godfrey test is performed to test if the errors from different times are correlated. If this is the case, then there is a serial correlation. This would render the regression results invalid (Wooldridge, 2009). To perform the Breusch-Godfrey test, the following hypothesis is specified:

$H_0$ : The errors are not serially correlated.

$H_1$ : The errors are serially correlated.

The results from the test are presented below. The first row shows the results for the model with corruption perceptions index, while the second row shows the results for the model with the control of corruption.

Table 8

*Breusch-Godfrey Test for Serial Correlation*

	Breusch-Godfrey t-statistic	P-Value
<b>Model With Corruption</b>	0.901	0.342
<b>Model with WBCorruption</b>	1.166	0.280

Source: Author's Computation using data from World Bank

The Breusch-Godfrey t-statistic for both the model with corruption perceptions index and control of corruption are statistically insignificant. With a p-value of 0.34 and 0.28, there is not enough reason to reject the null hypothesis. The regression result is therefore not affected by the serial correlation problem, hence its validity.

## CHAPTER FIVE: CONCLUSIONS

This chapter summarizes the findings in chapter four and draws conclusions on how the findings contribute to the research objectives. Finally, suggestions are provided for future research and recommendations are made for policymakers.

### 5.1 Summary of Findings

The objectives of this study were outlined at the beginning of the study as follows:

- To determine the impact of corruption on FDI inflow in Ghana
- To determine how the 2008 financial crisis affected the corruption-FDI relationship in Ghana.

The corruption perceptions index shows a positive relationship with FDI inflow in Ghana. The result for the 2008 financial crisis is statistically insignificant. When tested jointly, corruption and its lag are insignificant.

When the control of corruption is used as the proxy for corruption, the regression result is different from the regression with the corruption perception index as the proxy for corruption. The corruption perceptions index shows a significant positive relationship with FDI inflow, while the control of corruption shows an insignificant negative relationship with FDI inflow. Hence, the results from estimating the corruption-FDI relationship may depend on the choice of corruption variable used as a proxy for corruption.

### 5.2 Conclusions

The study has provided evidence to support the helping hand theory of corruption, which postulates that FDI flows more to highly corrupt regions because it serves as



grease in the wheels of business by expediting processes. A possible reason for this result is that institutions in Ghana are bureaucratic, and corruption offers foreign firms the opportunity to get processes expedited.

### **5.3 Recommendation for Policy Making**

The study has shown that corruption is positively related to FDI. This means that if corruption reduces, FDI will also reduce, all other things being equal. The Ghana Investment Promotion Centre (GIPC) needs to put in place measures that will induce foreign investors to invest in Ghana. This will ensure that future reduction in corruption will not have much effect on the FDI inflow.

### **5.4 Direction for Future Research**

- An underlying assumption of the helping hand theory is the presence of weak institutions in the host country. This study did not investigate the nature of institutions and the regulatory environment in Ghana. Hence, future research could delve deep into the nature of Ghana's institutions and regulations that make corruption attractive for foreign investors.
- Future research could also review and make comparative analyses of the methodologies used for creating the corruption indices, particularly the corruption perceptions index and the control of corruption.
- Finally, future studies could focus on the impact of corruption on sectoral FDI inflow in Ghana.

### **5.5 Limitations of the Study**

- Insufficient data availability is one major problem encountered. The researcher intended to include some relevant independent variables in the model, but because

they were either insufficiently available or totally unavailable, those variables could not be included.

- Time constraint is another limitation encountered. The time to complete this research was very limited. More time would have allowed to collect primary data on the variables for which secondary data is unavailable or scantily available.
- The sample size used is small. The study started with forty observations, but after second differencing, it was reduced to thirty-six.

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**APPENDIX**  
Appendix A

**Stationarity Test on Variables After Differencing**

Variables	Dickey-Fuller t-statistic	P-Value
Corruption	-5.14	0.01
WBCorruption	-3.98	0.02
FDI	-5.45	0.01
RGDPPC	-4.65	0.01
ExchRate	-4.31	0.01
Openness	-4.86	0.01
INF	-5.90	0.01
Govern	-5.167	0.01