EXAMINING THE INTERACTION EFFECT OF CORRUPTION AND MARKET SIZE ON FDI INFLOWS IN THE SADC REGION: A METHOD OF MOMENTS QUANTILE REGRESSION APPROACH

MASTER OF ARTS (ECONOMICS) THESIS

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MA (Economics) Thesis

By

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DECLARATION

I, the undersigned, certify that this thesis is my own work and has never been sent to this or any other university or school of higher education for a similar purpose. Where other people's work has been used, acknowledgements have been made. All errors contained herein are the author's sole responsibility.

CHARLES CHINANGWA

_____

Full Legal Name

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Signature

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Date

CERTIFICATE OF APPROVAL

The undersigned certify that this study represents the student's own work and effort, and it makes acknowledgements where other sources of information are used. The study is submitted with our approval.

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Second Supervisor

DEDICATION

I dedicate this dissertation to my parents, who worked very hard to make sure I am who I am today. So, Dad and Mom, this one is for you.

ACKNOWLEDGEMENTS

I owe Jehovah God Almighty the utmost gratitude and praise for providing me with the guidance, fortitude, wisdom, and courage necessary to complete this task successfully. Indeed, everything is possible with God. My supervisors, Dr. F. Chigaru and Mr. I. Makuta, deserve a lot of credit for overseeing this work. Many thanks for their dedication and support in the form of positive criticism, suggestions, comments, and encouragements that contributed to the success of this research.

Thank you to my family for their moral, mental, and emotional support throughout my studies.

ABSTRACT

Using both a Random Effects (RE) model and a Method of Moments Quantile Regression (MM-QR) with random effects, this study examines the relationship between foreign direct investment (FDI), corruption, and market size. The study makes use of panel data from 16 different nations. The primary goal is to investigate how corruption and market size influence FDI, with a particular emphasis on corruption's heterogeneity and distribution effects on investment flows. The RE model's findings show a positive correlation between FDI and lagged FDI, trade openness, and per capita GDP growth, but a significant negative correlation between corruption and inflation. However, corruption losses significance when interacted with GDP per Capita. This implies that expansion in market size may mitigate the adverse effects of corruption on FDI. The MM-QR model shows that for countries attracting higher volumes of FDI, the impact of corruption on FDI decreases. The interaction term, when added to the MM-QR model, is found to be statistically significant at the 75^{th} and 95^{th} percentiles. Based on the found positive coefficients, it shows that an increase in market size at a certain level of corruption attracts more FDI. Comparing the 75^{th} and 95^{th} percentiles, a more substantial effect exists at the 95^{th} percentile. This implies that the result is even more substantial in the larger economies. From a policy standpoint, the findings underscore the imperative for SADC nations to amend and adopt inclusive anti-corruption policies. These policies include SADC Protocol Against Corruption, and other country specific policies like Malawi National Anti-Corruption Strategy.

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ABBREVIATIONS

CPI	Corruption Perception Index
EO	Economic Openness
ES	Economic Stability
FDI	Foreign Direct Investment
FE	Fixed Effects
GDP	Gross Domestic Product
GDPPC	Gross Domestic Product Per Capita
MM-QR	Method of Moments Quantile Regression
SAARC	South Asian Association for Regional Cooperation
SADC	Southern African Development Community
TP	Transparency International
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
WB	World Bank

CHAPTER ONE

INTRODUCTION

1.1 Background

Corruption is improper utilisation of power by governmental authorities for personal gain, and it is a governance obstacle experienced by countries worldwide (Rose, 2018; Ackerman, 1996). Corruption which exists in various forms, such as bribery, misappropriation of resource and nepotism, causes harmful effects on the economies, with a significant impact on developing nations.

Corruption destabilises economic development and progress on a global scale. According to 2021 Corruption Perceptions Index (CPI) by Transparency International, about two-thirds of countries, have scores below 50 on a scale of 0 (extremely corrupt) to 100 (extremely clean), indicating a severe corruption problem. In 2020, the cumulative total cost of corruption on a global scale was estimated to be $3.6 trillion (United Nations, 2021). The existing trends of corruption may negatively affect investment, as corruption may raise operational costs, creates unpredictability of the market, and promotes a risky environment that can deter potential investors. A study by the International Monetary Fund (IMF), 2019, portrayed that a point rise in a nation's CPI score could result in a 1.7% increase of FDI inflows.

In the Southern African Development Community (SADC), corruption remains a crucial macroeconomic challenge which affects the economic growth. The 2021 CPI showed various levels of corruption in the region such as, the Democratic Republic of Congo had a CPI score of 18, Zimbabwe had 24, Botswana had 60, and Seychelles had 66. Even though Botswana and Seychelles are recognised as the least corrupt countries in the region

they fail to attract higher FDI inflows in comparison with other countries in the region. Specifically in 2020, Botswana received a total $261 million in FDI and Seychelles received $115 million in FDI, whereas Mozambique and Angola, which had a significantly lower CPI scores of 25 and 27, received $2.3 billion and $2.8 billion respectively (UNCTAD, 2021). Thus, it can be concluded that the correlation between corruption and FDI is not linear.

This study is motivated by the desire to understand correlation dynamics of corruption and FDI in the SADC region. The existing body of literature primarily assumes the correlation between corruption and FDI to be linear, disregarding the existing dynamics using available data. For example, the overall correlation between a higher CPI score and increased FDI inflows, this relationship does not hold true for all SADC countries according to available data as discussed in the preceding paragraph. Hence this study focuses to understand further the dynamics of corruption and FDI, and contribute other solutions to policy makers in the development of anti-corruption strategies. According to the world bank 2020, it states that improving governance and minimising corruption in Sub-Saharan Africa could increase the region's annual GDP growth by 3%.

The existing trend in the SADC community which shows that Seychelles and Botswana do not attract proportionally more FDI despite having reduced levels of corruption, suggests that other factors, such as political stability, market size, FDI volume, FDI type and country specific policies, may contribute to the correlation between Corruption and FDI. Thus, it is important to conduct a further analysis on some of the captioned factors in conjunction with corruption to understand the corruption impact on FDI. Deeper understanding of ways corruption affects FDI in the SADC region will improve the current knowledge between corruption and FDI. The core objective of this study is to contribute to the existing body of academic literature and provide additional recommendations to policymakers who are working to establish a more favourable climate for foreign investment. By identifying and addressing the fundamentals that impact FDI, this study has the potential to contribute to the development of new anti-corruption strategies that foster sustainable economic progress in the SADC community.

1.2. Problem Statement and Significance of the Study

The pervasive nature of corruption poses a significant barrier to economic progress, particularly in developing countries, where it distorts fair resource allocation and undermines economic effectiveness. The United Nations Economic Commission for Africa (UNECA, 2011) identified corruption as a significant development challenge for Africa, highlighting its capacity to divert resources meant for development... Despite various anticorruption strategies implemented by the Southern African Development Community (SADC), such as the SADC Protocol Against Corruption, aimed at improving governance and the economic environment, the impact of these measures on attracting foreign direct investment (FDI) remains uncertain. The existing knowledge of research, illustrated by many researchers such as Zander (2021), Chamisa (2020), Zangina and Hassan (2020), Arif, Khan, and Waqar (2020), and Mosikari, Nthebe, and Eita (2018), show a negative impact of corruption on Foreign Direct Investment (FDI) as it can create an uncertain investment climate, thereby reducing the attractiveness of a region to foreign investors. .

The fundamental foundation of the anticorruption strategies as supported by existing empirical literature considers the relationship between corruption and FDI to be consistent across all volumes of incoming FDI which fails to consider the existing dynamics of correlation between Corruption and FDI. Thus, this study intends to fill a vacuum in the present literature through the SADC region by examining the variations in the link between corruption and FDI, specifically how corruption affects different volumes of FDI. Barassi and Zhou (2012) showed in OECD countries that corruption has a distinct impact on the volume of foreign direct investment (FDI) received. They argued that smaller firms, which are associated with small volumes of FDI, view corruption as a more substantial risk compared to larger firms.

Furthermore, SADC's anticorruption strategies have met various obstacles, mainly attributed to a need for stronger political will to implement the established strategies (Ackerman, 1999). Therefore, these obstacles raise the question of whether other indirect methods might be more effective in dealing with corruption. Another area of interest in the study is assessing whether an increase in market size may indirectly counteract the effects

of corruption within the region, as larger markets generally attract larger volumes of FDI (Lim, 2001).

Thus, the study seeks to contribute to the existing body of literature by investigating the heterogeneity in the relationship between corruption and FDI in the SADC region and by examining the role of market size as a potential mitigating factor against the impacts of corruption. The findings will assist SADC decision-makers and beyond in developing custom-made policies.

1.3. Objectives of the Study

The primary objective of this study is to investigate the impact of corruption on FDI to the SADC region. Specifically, this research intends to:

i. Examine the effect of corruption on FDI in the SADC region.
ii. Investigate whether an increase in market size can reduce the effects of corruption on FDI.
iii. Investigate whether the effect of corruption on FDI differs across the different volumes of FDI.
iv. Investigate whether an increase in market size can reduce the effects of corruption across different volumes of FDI.

1.4. Study Hypotheses

From the stated specific objectives, the study will test the following hypotheses drawn from empirical findings captioned in the problem statement:

i. There is negative correlation between corruption and FDI in the SADC region.
ii. Increase in Market Sizes reduce the effects of Corruption on FDI in the SADC region.
iii. The effects of corruption on FDI differs across different volumes of incoming FDI.
iv. Increase in market size reduce the effects of corruption across different volumes of FDI.

1.5. Organization of the Paper

Following the topic's introduction in Chapter 1, Chapter 2 provides an overview of the FDI inflows, perceived levels of corruption, and governance scores of the SADC countries. The literature review is highlighted in the third chapter. In contrast to Chapter 4, which describes the methodology, Chapter 5 discusses the findings. Chapter 6 concludes with a summary and recommendations for future research.

CHAPTER TWO

OVERVIEW OF FDI INFLOWS, CORRUPTION AND GOVERNANCE IN THE SADC REGION

2.1. Introduction

This chapter presents a concise overview of foreign direct investment (FDI) inflows, the prevalence of corruption, and the state of governance within the Southern African Development Community (SADC) region.

2.2. FDI in the SADC region

Information under this under this section has been retrieved from United Nations Conference on Trade and Development (UNICTAD, .

2.2.1. Overview of FDI in the SADC Region

Between the years 2010 and 2020, the Southern African Development Community (SADC) region experienced fluctuating patterns in Foreign Direct Investment (FDI). This period witnessed instances of substantial inflows in certain years, while in others, there were noticeable decreases. Based on data provided by the United Nations Conference on Trade and Development (UNCTAD), it is observed that the inflow of foreign direct investment (FDI) to the Southern African Development Community (SADC) region experienced a notable growth trajectory, rising $21.6 billion in 2014. However, subsequent to this peak, there was a decline in FDI inflows to $15.4 billion in 2019.

The decrease in foreign direct investment (FDI) inflows can be ascribed to various factors, such as the decline in commodity prices, political instability, and policy uncertainty observed in certain nations within the Southern African Development Community

(SADC). In 2019, South Africa, which stands as the primary recipient of foreign direct investment (FDI) within the Southern African Development Community (SADC) region, experienced a decline of 15% in FDI inflows. This decrease can be attributed, at least in part, to factors such as policy uncertainty and apprehensions regarding economic performance.

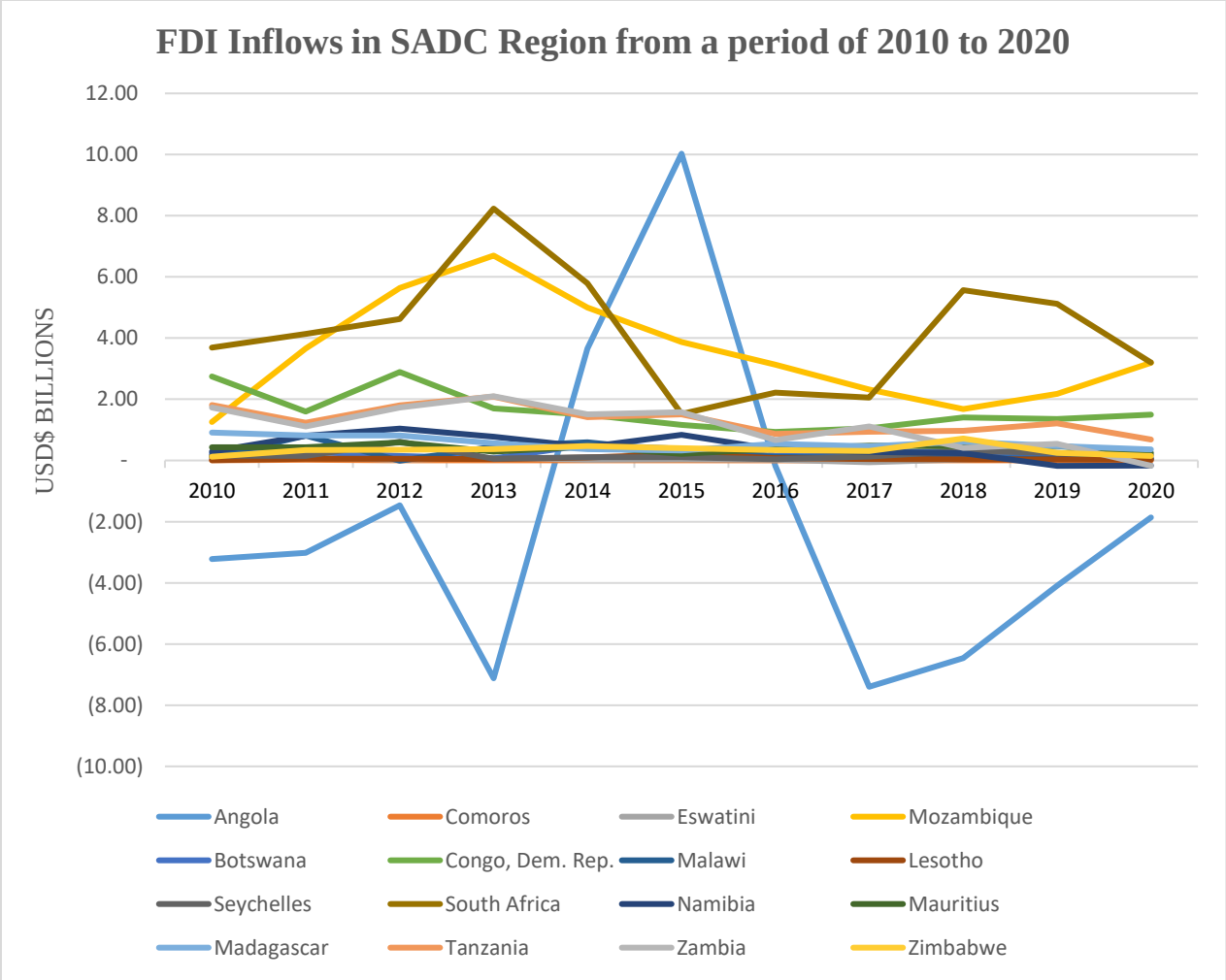

Figure 1: FDI Inflows in SADC

In recent years, several nations within the Southern African Development Community (SADC) have successfully attracted significant inflows of foreign direct investment (FDI). As an illustration, Mozambique experienced a notable surge in foreign direct investment (FDI) inflows in 2019, amounting to $4.2 billion. This figure represents a substantial growth of 60% compared to the preceding year, predominantly attributed to investments made in Mozambique's natural gas industry. In 2019, Tanzania experienced a notable rise

of 13% in foreign direct investment (FDI) inflows. This increase was primarily observed in the mining, manufacturing, and services sectors, indicating a growing interest from international investors in these industries.

2.2.2. Specific FDI Trends, Corruption Score, and Governance Score in SADC Countries

The information was retrieved from United Nations Conference on Trade and Development[1], Southern African Development Community[2] and World Bank[3].

2.2.2.1. FDI Trends in SADC Countries

Foreign direct investment (FDI) has been instrumental in driving the economic progress of countries within the Southern African Development Community (SADC). The SADC region has emerged as an appealing destination for foreign direct investment due to its ample reserves of natural resources, such as minerals, oil, and gas, alongside its growing consumer market. Historically, South Africa has held the position of being the primary beneficiary of foreign direct investment (FDI) within its region, owing to its good infrastructure, well-established institutions, and extensive domestic market. Angola and Mozambique, among other nations, have experienced significant inflows of foreign direct investment (FDI), primarily attributed to their abundant natural resources, particularly in the oil, gas, and mining sectors. On the other hand, nations characterised by smaller economies and markets, such as Lesotho, Eswatini (formerly Swaziland), and Comoros, tend to attract comparatively lower levels of foreign direct investment (FDI). The mean value of foreign direct investment (FDI) inflows into the Southern African Development Community (SADC) region has exhibited a consistent upward trend, albeit subject to annual variations attributable to shifts in global economic circumstances, commodity valuations, and the specific political and economic stability of individual countries. The sectors that exhibit the highest levels of foreign direct investment (FDI) in the Southern African Development Community (SADC) region encompass mining, oil and gas,

[1] www.unctad.org
[2] www.sadc.int
[3] www.worldbank.org

manufacturing, telecommunications, and retail. Furthermore, there has been a notable rise in investments directed towards renewable energy and infrastructure.

2.2.2.2. Corruption in SADC Countries

Corruption exerts a detrimental impact on the economic growth, social development, and political stability of several countries within the Southern African Development Community (SADC). Corruption levels exhibit significant variation across the region, with certain countries demonstrating comparatively superior performance. According to Transparency International's Corruption Perceptions Index (CPI), South Africa, Botswana, and Namibia exhibit comparatively higher scores in relation to other countries in the region. This suggests that these nations have relatively lower levels of perceived corruption within their respective public sectors. Botswana has garnered attention for its status as one of the least corrupt countries in the African continent. On the other hand, it is noteworthy that nations such as Zimbabwe, Angola, and the Democratic Republic of the Congo exhibit relatively elevated corruption scores, thereby suggesting a greater perception of corruption within these jurisdictions. Based on international benchmarks, it can be observed that countries within the Southern African Development Community (SADC) exhibit varying degrees of corruption, generally ranging from moderate to high levels. However, there exists a significant degree of variation within the specified geographical area. A range of anti-corruption measures have been implemented across the region. Legislative measures have been implemented by numerous nations through the enactment of anti-corruption laws and the establishment of anti-corruption commissions or bureaus. Judicial enforcement has also played a role, with certain nations demonstrating greater effectiveness in prosecuting and penalising high-level corruption. However, the success of such enforcement efforts often hinges on the independence of the judiciary. The countries belonging to the Southern African Development Community (SADC) have actively engaged in both regional and international efforts to combat corruption. Notably, they have taken part in initiatives such as the African Union's Convention on Preventing and Combating Corruption and the United Nations Convention against Corruption.

2.2.2.2. Governance in SADC Countries

Botswana's adherence to the principles of the rule of law, implementation of anti-corruption measures, and effective governance have contributed to its attainment of high rankings in governance assessments relative to other countries within the Southern African Development Community (SADC). In contrast, nations characterised by diminished political stability, inadequate corruption control, and a less rule of law frequently obtained inferior ratings. Illustrative instances encompass the Democratic Republic of the Congo and Zimbabwe. There was significant variation observed among countries in the SADC region with regard to the average scores on various dimensions of governance. The member states comprising the Southern African Development Community (SADC) have made notable advancements in enhancing their governance structures and practises. The aforementioned factors encompass institutional reforms, anti-corruption initiatives, the facilitation of political stability, the strengthening of the rule of law, and the enhancement of voice and accountability. The objectives of these reforms encompass the enhancement of public financial management and the rationalisation of government services.

2.2.3. Conclusion

This chapter explained the SADC region with regard to the inflow of foreign direct investment (FDI), governance, and the prevailing of corruption. According to data from the World Bank, the Southern African Development Community (SADC) region witnessed a cumulative inflow of $245.51 billion in Foreign Direct Investment (FDI) by 2020. The Southern African Development Community (SADC) has formulated policies and protocols aimed at enhancing foreign direct investment (FDI) by means of direct investment in production activities, rather than relying on the accumulation of funds through the sale of stocks and bonds (SADC, 2012). Out of the 16 member states within the region, 12 are categorised as highly corrupt, thus signifying the pervasiveness of corruption perceptions. Consequently, nations endeavour to establish efficient governance systems to address and mitigate instances of corruption.

CHAPTER THREE

LITERATURE REVIEW

3.1. Introduction

This chapter undertakes an analysis of the existing body of literature in order to establish a solid basis for conducting a comprehensive analysis of the study. The theoretical framework is positioned prior to the empirical literature and conclusion.

3.2. Theoretical Framework

The institutional economics theory, the eclectic paradigm, and the gravity model of FDI provide a solid framework for examining the effects of corruption on FDI. This framework will enable the identification of factors that influence FDI flows and provide policymakers with suggestions for enhancing the business climate and attracting more foreign investors to the region.

3.2.1. The institutional economics model

Institutional economics model focuses on the influence of institutions on economic behaviour and outcomes. The fundamental premise of institutional economics is that economic behaviour is influenced by the rules, norms, and customs of the social and economic systems within which individuals operate, (Thorstein 1904). Institutional economics was first developed by economists such as Thorstein Veblen and John Commons. It was further developed by scholars such as Douglass North, Oliver Williamson, and Elinor Ostrom in 1940.

Institutional Economics model studies how institutions, such as laws, regulations, and social norms, influence economic behaviour and outcomes. Corruption can have

detrimental effects on foreign direct investment (FDI) flows, according to Institutional Economics. Corruption creates an uncertain business climate, which can deter foreign investors from investing in a nation. When corrupt officials demand bribes or engage in other illegal activities, they raise the cost of doing business, thereby decreasing the potential profits for foreign investors. In addition, corrupt officials may not fairly enforce contracts or property rights, making it difficult for foreign investors to safeguard their investments (Ayres, 1944). In addition, institutional economics emphasises the influence of legal and regulatory institutions on economic outcomes. Strong legal and regulatory institutions can help prevent corruption and provide a stable and predictable business environment, thereby attracting foreign direct investment. In contrast, weak institutions may facilitate corruption and erode investor confidence, thereby decreasing FDI flows. Overall, the Institutional Economics model indicates that corruption can have a negative effect on FDI and that strong legal and regulatory institutions are essential for attracting foreign investment.

Ultimately, the model provides a solid foundation for evaluating the effect of corruption and governance systems on FDI in the SADC region; therefore, it has been applied in the study.

3.2.2. The eclectic paradigm

The eclectic paradigm, also known as the OLI framework, is a theoretical model that explains why firms engage in foreign direct investment (FDI) and how they decide where to invest. John Dunning, an international business scholar and economist, developed the eclectic paradigm (1977). Since then, the eclectic paradigm has become one of the most influential frameworks for explaining foreign direct investment (FDI) and behaviour of multinational corporations (MNC).

The framework is founded on three important factors: ownership advantages, location advantages, and internalisation advantages. Ownership advantages refer to a company's specific advantages that allow it to effectively compete in a foreign market. These benefits may consist of greater technology, specialised knowledge, and brand recognition. Thus,

this implies that the firms can earn sustainable returns if they have superior resources over its competitors (Abotsi, 2016).

Advantages of location refer to the specific benefits of locating an investment in a particular country. This can include access to natural resources, low labour costs, and advantageous tax policies. Institutions in the domestic country have the potential of attracting foreign firms depending on competitive advantage the existing institutions, portray towards the foreign firms (Williamson, 2000).

Internalization advantages refer to the benefits gained by businesses when they control the production process in-house, as opposed to relying on external suppliers or partners. These benefits may include reduced transaction costs, improved quality control, and increased flexibility. Therefore, the objectives and strategies adopted by the firms, the extent and pattern of production and the choice of a country to invest will be contingent on the challenges and opportunities existing in different countries (Williamson, 2000).

Firms engage in FDI when they have ownership advantages, location advantages, and internalisation advantages, according to the eclectic paradigm. The decision to engage in foreign direct investment (FDI) is based on a cost-benefit analysis, in which the benefits of investing in a foreign market must outweigh the costs. Overall, the eclectic paradigm provides a framework for understanding the motivations and strategies of multinational enterprises (MNEs) engaging in foreign direct investment (FDI). The framework has shaped international business research and practise significantly.

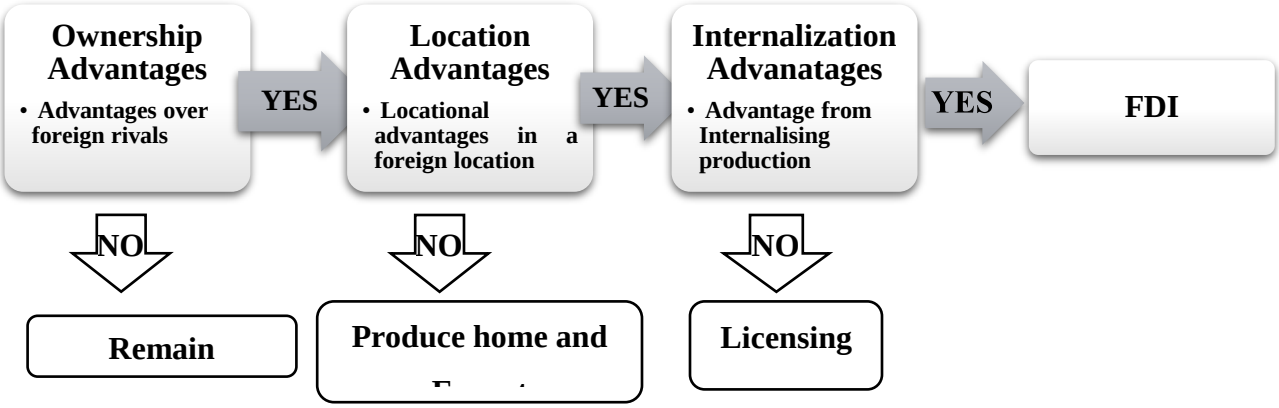

Figure 2: The Electric Paradigm

Source: Authors Summary of the Model

According to Dunning (2006), corruption can reduce the attractiveness of a country as a location for foreign direct investment (FDI) by increasing uncertainty and risk, which makes it difficult for foreign firms to fully realise location advantages. In addition, corruption can impede the internalisation of activities and capabilities by making it difficult for businesses to establish and maintain trustworthy relationships with local partners. Corruption can also diminish internalisation advantages, which are the benefits firms derive from controlling the production process internally rather than relying on external suppliers or partners. Corruption can make it difficult for businesses to establish and maintain trustworthy relationships with local partners, impeding the internalisation of activities and capabilities. All in all, the eclectic paradigm suggests that corruption can diminish a country's appeal to foreign direct investment (FDI) by eroding its locational and internalisation advantages. Thus, application of this model to this study significantly assists in understanding of the effects of corruption on FDI in the SADC region.

3.2.3. Gravity Model of FDI

The gravity model of trade, first put forth by Tinbergen in 1962, serves as the foundation for the gravity model of foreign direct investment (FDI). The gravity model is a concept originally derived from the force of gravity in physics. This analogy underscores how factors within the host country exert a 'pulling' force, similar to the gravitational pull

between objects. Such factors, which attract FDI, are comparable to the location advantages described in the ownership-location-Internalization (OLI) paradigm. According to the gravity model of trade, the amount of merchandise that moves between nations depends on both their distance and economic size. The gravity model of FDI extends this analogy to FDI by proposing that the flow of investment between nations is also proportional to the economic size of the investor and host nations, as well as other elements like cultural ties and institutional similarity. The gravity model of trade was initially put forth by Janinbergen, but Markusen (1995), who developed the theoretical underpinnings and applied them to empirical research on FDI flows, is frequently credited with adapting the model to FDI. The gravity model of trade and FDI has also been used and developed by other academics, including Helpman (1984) and Bergstrand (1985). Since that time, the gravity model has grown to be a popular framework for comprehending the trends and causes of FDI flows.

$$\chi_{ij}=\frac{Y_i Y_j}{Y^w}\left(\frac{t_{ij}}{\Pi_i P_j}\right)^{1-\sigma} ,\sigma>1 \quad \text{...} \quad (1)$$

Where; χ_{ij} represents FDI from country i to country j, Y_i is the nominal Income fro residents in the country i, Y_j is the nominal income for residents in country j, $Y^w = \sum i \ Y_j$ is the world nominal income, t_{ij} is the transport cost between I and j, $\Pi_i P_j$ is the unobservable multilateral resistance term, which reflects third-country effects. Finally, σ is a parameter greater than 1 that denotes the constant elasticity of substitution between varieties of countries i and j.

The gravity model of FDI proposes the flow of investment between countries is proportional to the size of their economies, the distance between them, and other factors such as a shared language, cultural ties, and institutional similarity. According to the gravity model, FDI flows are determined by the economic sizes of the host country and the investor country, in addition to other factors that influence the attractiveness of investment, such as the level of development, political stability, and the business environment. The model suggests that economies with larger potential markets and greater access to resources are more attractive for investment. Additionally, culturally, or institutionally similar countries are more likely to attract investment because they offer a more familiar

and predictable business environment. The gravity model of FDI has been extensively utilised in empirical research and proven to be a valuable tool for predicting FDI flows. However, the model has also been criticised for oversimplifying the complex factors that influence investment decisions and for failing to take into account the unique characteristics of various industries and sectors. Despite these limitations, the gravity model remains an important theoretical framework for comprehending the patterns and determinants of foreign direct investment (FDI) flows. With this context in mind, the model was applied to this study to comprehend the factors that affect FDI inflows in the SADC region.

3.3. Empirical Literature

The two competing hypotheses that have been debated over the years are first taken into consideration as this section reviews empirical studies done on the subject. According to the first hypothesis, corruption raises transaction costs, which deters FDI by acting as a barrier. Contrarily, corruption is seen as the engine that propels businesses past bureaucratic inefficiencies. As a result, these theories have been the focus of several studies.

3.3.1. Sand-the-Wheels Hypothesis

Corruption harms the host nation by eroding confidence in its institutions. Public servants frequently abuse their positions by leaking sensitive information to select companies in order to gain leverage over other companies. When there is a lack of trust in institutions, firms may be discouraged from making investments. In addition, corruption is not sanctioned by any legal institutions; therefore, the agent may demand additional payments even after completing the initial contract (Luo, 2004). Corruption leads to the misallocation of human resources, as efforts are redirected to non-productive actions, which has a negative effect on productivity in the long run. This has significant effects on the economy and the growth and development of a company (Baumol, 1996). In addition, corruption increases investment capital because substantial resources are allocated to negotiations with bureaucrats. Thus, corruption generates uncertainty and mistrust in formal and legal

institutions, which hinders firms' ability to pursue investment opportunities (Ackerman, 1996).

3.3.2. Greasing the Wheels Hypothesis

Corruption, on the other hand, can stimulate investment in countries with weak and underdeveloped institutions (Krammer, 2014). The government's intervention to eliminate corruption entirely may exacerbate the problem and increase inefficiency. Thus, the grease hypothesis's main assumption suggests that corruption can assist firms in overcoming complex and time-consuming bureaucratic procedures (Verdier, 2000). The theory of bureaucratic inefficiencies has also investigated the impact of corruption on human capital, arguing that corruption can improve the quality of civil servants. In economies where government officials' salaries are low, corruption is seen as a motivator. Thus, through corruption, civil servants can raise their living standards, increasing their supply and quality (Bayley, 1966).

3.3.3. Empirical Evidence

Several studies have been conducted to assess the impact of corruption on FDI inflows into a country. The findings varied, with some papers finding a positive correlation between FDI and corruption and others finding a negative correlation. Of note, all studies captioned assumed a homogenous correlation between corruption and FDI.

Hamza, Aliyu, and Jibril, (2021) investigated the influence of corruption on foreign direct investment (FDI) in Nigeria. Using panel data for the period 1996–2016, the study estimated the effect of corruption on FDI. According to the findings of the study, corruption had a significant negative impact on FDI flows to Nigeria. Specifically, the study found that a one standard deviation increases in corruption reduced FDI inflows by 2.8%. Other factors, such as market size, natural resources, and infrastructure contributed positively to FDI flows in Nigeria, according to the study. The negative effect of corruption on FDI, according to the researchers, was due to the increased risk and uncertainty associated with investing in a corrupt environment. They contend that corruption creates an uneven playing field for foreign investors because corrupt officials may demand bribes or engage in other

illegal activities, thereby increasing the cost of doing business in Nigeria. This reduces the profitability of foreign direct investment and discourages foreign investors from investing in Nigeria. Overall, the study emphasised the need to combat corruption and establish a transparent and predictable business environment in order to attract foreign investment. In order to attract more FDI and advance economic development, the researchers argued that Nigeria must implement reforms to reduce corruption, such as strengthening anti-corruption institutions and enhancing governance practises.

Oktay (2017) investigated how corruption affects FDI in transition economies. The study estimated the direction of causality between corruption and FDI using panel data from 1996–2016. The study found that corruption negatively impacts FDI inflows in transition economies, mostly due to the direction of causality. The study found that one percent increase in corruption reduces FDI inflows by 10%. Corruption increases the risk and uncertainty of investing in a corrupt environment, as corrupt officials may demand bribes or engage in other illegal activities, raising business costs and reducing FDI profitability. The study also suggested that corruption causes low FDI inflows in transition economies, not vice versa. The study emphasised reducing corruption and improving the business environment to attract foreign investment in transitional economies. To attract more FDI and promote economic development, policymakers in these countries should strengthen anti-corruption institutions, improve governance practises, and increase transparency and accountability.

The effect of corruption on foreign direct investment (FDI) in South Africa from other African nations was studied by Mosikari and Eita, in 2019 using the gravity model. The study's findings indicated that FDI flows from other African nations to South Africa are significantly harmed by corruption. According to the study, FDI inflows are decreased by 10% on average for every one percent increase in corruption. The study also found that other elements, such as infrastructure, market size, and natural resources, have a favourable impact on FDI flows to South Africa. The researchers argued that the increased risk and unpredictability involved in investing in a corrupt environment is what causes corruption to have a negative impact on FDI. This consequently lowers the FDI's profitability and

deters foreign investors from making investments in South Africa. Overall, the study emphasises how crucial it is to fight corruption and create a predictable, open business environment in order to draw foreign investment to South Africa. The authors contend that in order to increase FDI and foster economic development, South Africa must implement reforms to fight corruption, including bolstering anti-corruption institutions and enhancing governance procedures.

In 2020, Nonnemberg, and Mendonça, investigated factors that influence FDI in developing nations. The study estimated the impact of various factors on FDI flows to developing countries using panel data for the years 1996–2013. The study found the significance of number of variables, including market size, natural resources, and human capital. The study also found that FDI flows are positively impacted by political stability and the calibre of institutions, such as the rule of law and regulatory quality. According to the study, FDI inflows are decreased by about 9% for every one percent increase in corruption. According to the researchers, corruption increases risk and uncertainty, making it challenging for foreign investors to fully reap the rewards of investing in developing nations. Inclusive, the study emphasised how crucial it is to establish a reliable business climate in developing nations to draw in foreign investment. The study contends that to increase FDI and foster economic development, developing nations must implement reforms to fight corruption, fortify institutions, and raise the standard of governance.

Using panel data from 2000 to 2018, Moustafa (2021) examined the relationship between perceived corruption and foreign direct investment (FDI) in Egypt. The study found a negative correlation between perceived corruption and foreign direct investment (FDI) in Egypt, indicating that higher levels of corruption are associated with lower levels of FDI. In addition, the study found that this negative relationship is stronger for high-tech sectors, indicating that corruption is a greater impediment to investment in these industries. In addition, the study also found that institutional quality and political stability have a positive effect on FDI in Egypt, suggesting that enhancing these factors could help the country attract more foreign investment. All in all, the study emphasised the significance of

combating corruption and enhancing institutional quality and political stability in order to attract more FDI to Egypt, especially in high-tech sectors.

Paul and Jadhav (2018) investigated the institutional determinants of foreign direct investment (FDI) in emerging markets. The study used panel data from 2002 to 2011 to estimate the impact of institutional factors on FDI inflows in emerging markets. The study found that the quality of institutions, which includes government effectiveness, rule of law, and regulatory quality, had a significant positive effect on FDI inflows in emerging markets. Strong institutions can reduce the risk and uncertainty associated with investing in emerging markets, making them more attractive to foreign investors, according to the study. In addition, the study found that corruption has a substantial negative impact on FDI flows into emerging markets. Corruption, according to the study, prevents foreign investors from realising the full benefits of investing in emerging markets. Furthermore, the study found that economic and political stability, as well as human capital, have a positive impact on FDI flows into emerging markets. The study argued that a stable and predictable business environment, along with a skilled workforce, can attract foreign investors and foster economic growth. In general, the study emphasised that to attract more FDI and promote economic growth, policymakers in emerging markets should implement reforms to enhance institutional quality, reduce corruption, promote stability and human capital development.

The relationship between corruption and foreign direct investment (FDI) inflows in the South Asian Association for Regional Cooperation (SAARC) nations was examined by Ghalib, Ali, and Shah in 2019. The study used data from 2002 to 2016. According to the study, corruption has a detrimental effect on FDI inflows to SAARC nations. The study also found the effect of corruption on FDI differs between various regional nations. Overall, the study showed that FDI can increase in a region if corruption is reduced, and that policymakers need policies that support accountability and transparency in the SAARC nations.

Luu, Ho, Nguyen, and Nam (2018) investigated the influence of corruption on foreign direct investment (FDI) and its various modes of entry, such as joint ventures and wholly-

owned subsidiaries. Using panel data from 12 Southeast Asian countries and a fixed-effects model, the study examined the relationship between corruption and FDI. Corruption had a negative impact on FDI and its various entry modes, according to the study. In particular, the study found that corruption decreases the likelihood of a joint venture while increasing the likelihood of a wholly owned subsidiary. The researchers speculate that this may be since wholly owned subsidiaries provide greater operational control and are less susceptible to corruption. To attract more FDI, they suggest that countries and industries with higher levels of corruption may need to take stronger measures to combat corruption and promote transparency.

Using a binary marginal perspective, Wu (2019) investigated the effect of corruption on Chinese outward foreign direct investment (OFDI). The study employed a random-effects model to examine the relationship between corruption and Chinese OFDI using data from 2003 to 2016. Corruption had a significant negative effect on Chinese OFDI, meaning that as corruption in a target country increases, Chinese investors are less likely to invest there. In addition, the study indicates that the effect of corruption on Chinese OFDI is nonlinear, indicating that there is a threshold beyond which the negative effect becomes more significant. The author also investigates institutional distance's moderating effect on the relationship between Chinese OFDI and corruption. The results suggest that the negative effect of corruption on Chinese OFDI is stronger in countries with a smaller institutional distance; that is, corruption has a greater impact on Chinese OFDI in countries with an institutional environment more similar to that of China. Overall, the study emphasised the necessity of reducing corruption to attract more Chinese OFDI.

Carvalho, Mariano, Polloni-Silva, and Rebelatto (2022) investigated the connection between corruption and FDI in Brazil. The study used a panel data model to analyse the relationship between corruption and FDI using data from 2000 to 2017. The "grease" hypothesis, which contends that corruption can facilitate FDI, is refuted by the study, which found that corruption had a negative impact on FDI inflows in Brazil. The study also suggested that corruption has a nonlinear impact on FDI inflows, i.e., there is a threshold at which the adverse effect becomes more noticeable. The study also looked at how

corruption affects FDI in various industries and discovered that the manufacturing sector is more negatively impacted by corruption than the service sector. They speculate that this might be the case because the manufacturing industry depends more on the government's infrastructure and regulations, which are more prone to corruption. Overall, the research indicated that for Brazil to draw more FDI, fighting corruption is essential. The study recommended that to encourage economic growth and development, policymakers should concentrate on enhancing the institutional environment and lowering corruption.

Hasan, Rahman, and Iqbal (2017) investigated the relationship between corruption and foreign direct investment (FDI) inflows in India and China. The study examined the impact of corruption on FDI inflows using data from 1990 to 2017 and panel data techniques. According to the study, corruption has a negative impact on FDI inflows into both India and China. Furthermore, the study contended that the impact of corruption on FDI inflows varies across sectors and industries. It was fond that, when compared to the service sector, corruption has a greater negative impact on FDI inflows in the manufacturing and construction sectors. Furthermore, the study investigated the effect of corruption on FDI inflows through various modes of entry, such as joint ventures and wholly owned subsidiaries. The study found that corruption has a greater negative impact on joint ventures than on wholly owned subsidiaries, implying that foreign investors prefer wholly owned subsidiaries because they provide greater control over operations and are less vulnerable to corruption. Generally, the study emphasised the importance of reducing corruption to attract more foreign direct investment into India and China.

Epaphra (2017) examined corruption and FDI inflows in 24 African countries. Corruption's effect on FDI inflows was examined using 2000–2016 panel data. Corruption hurts African FDI, according to the study. The study also found that corruption's negative impact on FDI inflows is nonlinear, with a threshold at which it becomes more significant. The study also found that extractive industries like mining and oil are more affected by corruption than other sectors. To attract more FDI to African countries, the study emphasised reducing corruption.

Zhorzholiani (2019) examined how corruption affects FDI inflows in Georgia, Armenia, and Azerbaijan. Corruption's effect on FDI inflows was examined using 2007–2017 panel data. Corruption deter FDI inflows in all three countries. The study also found that corruption negatively impacts FDI inflows in the service sector more than other sectors. The study also examined how corruption affects FDI inflows through joint ventures and wholly owned subsidiaries. Corruption appears to hurt joint ventures more than wholly owned subsidiaries. Thus, study emphasised reducing corruption to attract more FDI to the South Caucasus.

Yadav (2019) examined the impact of corruption on foreign direct investment inflows and economic growth in India. The study revealed a positive correlation between net FDI inflows and corruption in India. A one-point increase in the perception of corruption increased FDI inflows by 0.41%. However, there was a significant negative correlation between GDP growth and corruption, with a one-point increase in corruption perception resulting in a 0.56% decrease in GDP levels.

Presented empirical studies have demonstrated that, a variety of panel data methods can be used to reveal the relationship between corruption and FDI inflows. Most studies have employed the panel data version of the Granger causality test to determine the direction of causality, whereas pooled OLS, GLS, and dynamic panel data models such as GMM have been used to measure either impact. The dynamic panel data models incorporate the lagged dependent variable as an explanatory variable, thereby capturing the dynamic effects (Croissant and Millo, 2019). In order to capture the dynamics of the dependent variable, FDI inflows in SADC, this study employs dynamic panel data models.

3.4. Conclusion of Literature Review

This chapter presents prevailing economic theories regarding the effects of corruption on foreign direct investment (FDI) inflows. The existing body of empirical research pertaining to the relationship between foreign direct investment (FDI) inflows and corruption has identified two distinct perspectives. While certain studies support the "sand the wheels" hypothesis, alternative research supports the "grease the wheels" hypothesis. The chapter

presented a range of modelling approaches that can be used to comprehend the relationship between corruption and foreign direct investment (FDI) flows. The selection of panel data techniques employed was contingent upon the specific nature of the study.

CHAPTER FOUR

METHODOLOGY

4.1. Introduction

This chapter outlines the methodology used in this study to analyse the impact of corruption on foreign direct investment (FDI) in the Southern African Development Community (SADC). Panel data models, which are quantitative research methodologies, were utilised to analyse the study's objectives. Through the analysis of numerical data, quantitative research methodologies enable the methodical evaluation of facts. This methodology provides a systematic framework for empirical study by allowing the quantification of variables and the examination of their interrelationships (Creswell, 2014; Nachmias & Nachmias, 1996; Silverman, 2013).

4.2. Conceptual Framework

The utilisation of theoretical frameworks, demonstrated by Zhou's (2007) model, facilitates the comprehension of the various elements that impact the motivation of a multinational enterprise to engage in foreign direct investment (FDI). According to Zhou's theoretical framework, the motivation for a foreign corporation to engage in investment activities within a particular nation is contingent upon the disparity in financial gains derived from foreign direct investment (FDI) as opposed to exporting. This discrepancy is influenced by the prevailing market structure within the host country:

$$I = f(\pi^F > \pi^E) \quad (1)$$

Where;

I : Incentive for a foreign firm to invest in a particular country.

π^F : Profits derived from FDI.

π^E : Profits derived from producing home and exporting.

Taking into account the electric paradigm, gravity model of foreign direct investment (FDI), and Institutional Economics as frameworks for understanding the patterns of capital flow, particularly FDI, several factors emerge as pivotal. These factors encompass the legal, institutional, economic, and political dimensions. Thus, for the purpose of estimating the probability of foreign direct investment (FDI) in presence of corruption as main objective of the study, equation 1 is transformed into:

$$I_{i.jt} = 1 \quad \text{if } I^*_{i.jt} > 0$$

$$I_{i.jt} = 0 \quad \text{Otherwise}$$

(2)

$$\text{Where } I^*_{i.jt} = \beta_1 Corr_{it-1} + \pi_1 X_{i.jt-1} + \upsilon_{i.jt}$$

$$K_{i.jt} = \beta_2 Corr_{it-1} + \pi_2 X_{i.jt-1} + \upsilon_{i.jt}$$

Additionally, it is assumed that the error term in the equation adheres to the following condition:

$$E(\upsilon_{i.jt} \mid X_{i.jt}) = E(\upsilon_{i.jt}) = 0$$

$$\upsilon_{i.jt} \sim N(0, \sigma_\upsilon^2)$$

The variable $K_{i.jt}$ denotes the amount of foreign direct investment (FDI) that country j has invested in country i at time t. The matrix $X_{i.jt-1}$ comprises the control variables that have been identified in both theoretical[4] and empirical literature[5]. The composite error term, denoted as $\upsilon_{i.jt}$, encompasses various components that contribute to the determination of a firm's optimal capital stock for a specific source-host combination (i.j). One such component is the unobserved factor $\delta_{i.j}$, which represents time-invariant factors that may influence the firm's decision-making process.

[4] The electric paradigm, gravity model of foreign direct investment (FDI), and Institutional Economics.
[5] Does Corruption Affect Foreign Direct Investment Inflows in SADC Countries?, (Chamisa, 2020).

Nevertheless, it is important to note that the estimation of the relationship between corruption and FDI may be subject to sample selection bias due to the non-random selection of the sample based on equation (2). Hence, it is imperative to undertake a concurrent assessment of both the determinants of foreign direct investment (FDI) decisions and the factors that incentivize FDI (Zhou, 2007). A mathematical framework that can effectively address the issue of sample selection bias can be formulated in the following manner:

$$I_{i.jt} = 1 \quad \text{if } I^*_{i.jt} > 0$$

$$I_{i.jt} = 0 \quad \text{Otherwise}$$

(3)

$$\text{Where } I^*_{i.jt} = \beta_1 Corr_{it-1} + \pi_1 X_{i.jt-1} + \upsilon_{i.jt}$$

$$K_{i.jt} = \beta_2 Corr_{it-1} + \pi_2 X_{i.jt-1} + \upsilon_{i.jt}$$

$$K_{i.jt} = \beta_3 Corr_{it-1} + \pi_3 X_{i.jt-1} + \delta_{i.j} + \upsilon_{i.jt} \text{ if } I=1$$

4.3. Dynamic Panel Model

According to Blomstrom, Lipsey and Zejan (1996) FDI inflows follow the path dependence concept whereas past FDI inflows influence the current level of FDI inflows. Thus, the study employed dynamic panel data model which incorporate lagged dependent variables as one of the regressors;

$$y_{it} = \delta y_{i,\, t-1} + Z'_{it}\beta + u_{it} \qquad (4)$$

where $i = 1\ldots, N$ for N cross-sectional units and $t = 1\ \ldots, T$ for T time-periods; δ is a scalar and Z'_{it} a vector of $1 \times K$ independent variables. In this case, the error component is assumed to be compound, such that:

$$u_{it} = \mu_i + \varepsilon_{it} \qquad (5)$$

where μ_i denotes country-specific effect and ε_{it} is the disturbance error term.

The conceptual linkage between binary models (2 and 3) and the dynamic model (4) is the transition of binary models, which delineate the decision-making process regarding FDI based on comparative profit scenarios, to a dynamic model that underscores the influence

of past FDI decisions, as indicated by the lagged term $y_{i,\ t-1}$, on current FDI inflows, represented by y_{it}. This progression is said to highlight the path dependence of FDI, drawing on insights by Blomstrom, Lipsey, and Zejan (1996) to illustrate how the history of investments informs present and future investment flows.

4.4. Model Specification and Estimation Procedure

4.4.1. Random Effects Estimator

The study initially employed a homogeneous assumption between corruption and FDI. This was conducted to examine objectives 1 and 2 in the study. Thus, random effects estimator which uses within and between variations for estimation, was employed. The Hausman Test was conducted to ascertain the choice of random effects estimator. The random effects estimator model was specified as follows;

$$FDI_{it} = \beta_0 + \lambda\ FDI_{i,t-1} + \beta_1\ CORR_{it} + \beta_2 GDPPC_{it} + \beta_3 OPEN_{it} + \beta_4 INFLA_{it} + \beta_5 INFRA_{it} + \beta_6 PS_{it} + \mu_i + \varepsilon_{it} \quad (6)$$

Where:

FDI_{it} : Foreign Direct Investment for country i at time t

$CORR_{it}$: Corruption Perception Index (score) for country i at time t

$GDPPC_{it}$: Gross Domestic Product per Capita (USD) for country i at time t

$OPEN_{it}$: Trade Openness (in percent) for country i at time t

$INFLA_{it}$: Inflation Rate (in percent) for country i at time t

$INFRA_{it}$: World Bank's Logistics Performance Index (LPI) for country i at time t

PS_{it} : Political Stability Index for country i at time t

μ_i : Country-Specific fixed effect

ε_{it} : Disturbance error term

Of note, Panel models can be sensitive to different types of specification; thus the study introduced the interactive term (GDPPC x CORR) separately as another regressor to assess the effect of market size on corruption.

Model 6 integrates theoretical considerations from both the binary and dynamic models to conduct a thorough empirical analysis. This model aims to test the hypothesised relationships within a real-world context, operationalizing the theoretical constructs previously outlined. The inclusion of FDI and its lag in the dynamic and empirical models serves two main purposes. First, it affirms the theoretical assumption that historical investment flows influence current FDI decisions. Second, it makes it easier to do an empirical assessment that takes into account FDI dynamics.

4.4.2. Method of Moments Quantile Regression Estimator

The study also examined whether the heterogeneity assumption and corruption distribution effects, hold for the SADC region to capture objectives 3 and 4. Thus, the study employed a Method of Moments Quantile Regression (MM-QR) Estimator with random effects recommended by Machado and Silva (2019) as it minimises the effect of outliers. The MM-QR applies conditional scale functions to account for heterogenous and country specific effects in panel structure. The MM-QR is formally estimated as follows;

$$qy_i(\varphi \mid \mathrm{Z} = z) = z'\beta \tag{7}$$

Where *y* denotes FDI, Z is the vector of all regressors, φ represents the quantile and β is the set of elasticities to be estimated.

To account for individual country specific, individual intercept are added to equation 7;

$$qy_i(\varphi \mid Z_{it}) = \alpha_i + Z_{it}\,\beta q(\varphi), i = 1 \ldots, n, \tag{8}$$

Then known location-scale functions are included to account for unobserved conditional mean and variance. Thus, equation 8 is transformed into;

$$\hat{q}y_{it}(\varphi \mid Z_{it}) = \left(\widehat{\alpha_\iota} + \widehat{\delta_\iota}\hat{q}(\varphi)\right) + Z_{it}\left(\widehat{\beta} + \hat{\gamma}\hat{q}(\varphi)\right), \tag{9}$$

From equation 9, a point of estimate of variable of interest can at φ^{th} quantile can be estimated;

$$\hat{\beta}(\varphi \mid Z_{it}) = \hat{\beta} + \hat{q}(\varphi)\hat{\gamma} \tag{10}$$

Lastly the MM-QR estimation employs ordinary least squares (OLS) regression on time-demeaned independent and dependent variables as follows;

$$\frac{min}{q} \sum i \sum t\ \sigma_\varphi(\widehat{R_{\iota t}} - \left(\widehat{\delta_\iota} + Z_{it}\hat{\gamma}\right)q) \tag{11}$$

This approach allows for the estimation of coefficients β, residuals (R) pertaining to location, the scale parameter γ, and the unobserved conditional variance, which remains constant over time. All in all, while controlling for the same set of variables the MM-QR model applied in this study was specified as follows;

$$FDI_{it}(\tau) = \beta_0(\tau) + \lambda(\tau)FDI_{i,t-1} + \beta_1(\tau)CORR_{it} + \beta_2(\tau)GDPPC_{it} + \beta_3(\tau)OPEN_{it} + \beta_4(\tau)INFLA_{it} + \beta_5(\tau)INFRA_{it} + \beta_6(\tau)PS_{it} + \mu_i + \varepsilon_{it} \quad (12)$$

Same as the random effects equation the interactive term (GDPPC x CORR) was introduced separately.

4.5. Data

The selection of control variables has been based on an empirical study by Chamisa (2020) which utilised the FDI literature and identified factors which influence FDI inflows in the SADC region. The factors were supported by the theoretical framework adopted in this study. Table 1 summarizes the variables, source and the anticipated sign based on empirical and theoretical literature.

Table 1:: Data Source and Expected Sign

Variable	Data Source	Anticipated Sign
FDI	World Bank	
GDP per Capita	World Bank	+
Inflation	World Bank	-
Openness to Trade	World Bank	+
Political Stability	World Bank	-
Infrastructure	World Bank	+
Corruption	Transparency International	-

Table 1 presents factors that influence FDI inflows within the SADC region, as derived from Chamisa (2020). GDP per Capita serves as a proxy measure for market size, Multinational Corporations (MNCs) are encouraged to invest in larger markets due to increase in revenue. There is also anticipated positive correlation between good

infrastructure and foreign direct investment (FDI), as good infrastructure plays a significant role in reducing transportation costs. Additionally, Trade openness allows a country to establish connections with other countries, thereby creating opportunities for FDI. The presence of political instability has a detrimental impact on production, leading to a decrease in profitability for the host country. Consequently, this unfavourable business environment acts as a limiting factor for foreign direct investment (FDI). Finally, stable inflation rates have a favourable influence on investment due to an indication of a stable economic climate, whereas high inflation rates serve as a sign of economic instability.

4.6. Diagnostics Tests

The models were subjected to several estimation tests to ensure unbiased estimators are obtained. The following diagnostics tests were carried out.

4.6.1. Panel Unit Root Test

The variables in a panel dataset were tested for panel unit root to determine if they were stationary or non-stationary over time. The ability to draw accurate statistical conclusions relies on a time series maintaining a constant mean and variance (Greene, 2012). In this study, a Fisher test was used.

4.6.2. Heteroscedasticity Test

In panel data analysis, checking for heteroscedasticity is a must to avoid having inefficient and biased estimators (Greene, 2012). So, the Breusch-Pagan test was used to see if variance of the error terms remains constant across all values of the independent variables.

4.6.3. Autocorrelation Test

Autocorrelation, also known as serial correlation, occurs when the error terms in a regression model are correlated over time. In panel data analysis, assessing autocorrelation is essential, as the presence of autocorrelation can lead to inefficient and inconsistent parameter estimates (Gujarati, 2004). Thus, the Wooldridge test was used to test for autocorrelation.

4.6.4. Multicollinearity Test

When two or more independent variables in a regression model are highly correlated, estimating the individual effect of each correlated variable becomes difficult. Multicollinearity can also increase the standard errors of the coefficients (Gujarati, 2004). Thus, the study employed a correlation matrix to assess for collinearity.

4.6.5. Panel Specification Test.

The Hausman test was used to determine whether a fixed effects model or a random effects model was more appropriate.

4.7. Conclusion of Methodology

This chapter provides an overview of the analytical techniques utilised in this study to evaluate the effect of corruption and foreign direct investment (FDI). The study employed both random effects regression and Method of Moments Quantile Regression as methods of analysis. The chapter confirmed that diagnostic assessments were carried out, and the data were sourced from the World Bank and Transparency International.

CHAPTER FIVE

EMPIRICAL RESULTS AND DISCUSSIONS

5.1. Introduction

This chapter presents the findings derived from the approach outlined in Chapter 4. The section on results and interpretation includes diagnostic tests, as mandated for the model.

5.2. Descriptive Statistics

The dataset consisted of sixteen countries from the Southern African Development Community (SADC), serving as cross-sectional units observed over a span of 11 years, from 2010 to 2020. Hence, the total number of observations in the dataset was determined to be NxT, resulting in a count of 176 observations, signifying the presence of a balanced panel. Except for the FDI lag, which consisted of 160 observations as it was a transformed variable, Table 2 presents an overview of the descriptive statistics for the dataset.

Table 2: Descriptive Statistics

Variable	Unit	Obs	Mean	Std. dev.	Min	Max
FDI	$USD, Billions	176	0.78	1.98	-7.40	10.00
CORR	Scale (0-100)	176	36.53	13.06	15.00	66.00
GDPPC	$USD	176	3666.71	3964.62	324.83	16851.12
INFLA	Percent	176	11.57	45.76	-4.29	557.20
INFRA	Scale (1-5)	176	2.37	0.27	1.69	3.79
PS	Scale (-2.5-2.5)	176	-0.12	0.78	-2.30	1.11
OPEN	Percent	176	43.46	20.16	13.98	111.04
LFDI	$USD, Billions	160	0.81	2.04	-7.40	10.00

Source: Authors' computation based on secondary data acquired

The study analysed the economic indicators within the Southern African Development Community (SADC), focusing on understanding the essentials of Foreign Direct Investment (FDI). Table 2 shows that in the SADC region, Foreign Direct Investment (FDI) averaged around USD 0.78 billion, with a large standard deviation of USD 1.98 billion, indicating a significant disparity in FDI levels among SADC countries. FDI ranges from USD -7.4 billion (indicating a net outflow) to USD 10 billion, reflecting the variability in regional investor confidence. Notably, South Africa and Mauritius attract more FDI compared to other countries. Regarding corruption, SADC countries had an average corruption score of 36.53, with a standard deviation of 13.06. The low mean score and the wide range of scores (15 to 66) indicate that corruption is prevalent across the region, but it varies considerably between countries. Notably, Botswana stands out for its reputation for having low corruption rates. In terms of Gross Domestic Product per Capita (GDPPC), the SADC countries had a mean GDPPC of USD 3,666.71, with a large standard deviation of USD 3,964.62. This substantial deviation suggests significant differences in regional market sizes and economic development. The wide gap between the highest GDPPC (USD 16,851.12) and the lowest GDPPC (USD 324.83) highlights the economic inequality within the region. Seychelles, with a higher GDPPC, benefits from a vibrant tourism industry, while nations like Malawi experience considerably lower GDPPC figures.

5.3. Results and Interpretation

The section presents the results which were obtaining after employing the econometric techniques as highlighted in chapter 4.

5.3.1. Diagnostic Tests

Diagnostic tests play a crucial role in the field of econometrics as they serve to verify the fulfilment of the model's fundamental assumptions, ascertain the unbiasedness and consistency of the estimates, and validate the inferences drawn from the model. Considering the context, the study utilised a number of tests and transformations, as indicated is subsequent paragraphs. For a start all variables were transformed into natural logs to reduce a risk of heteroscedasticity (Chamisa, 2020).

5.3.1.1. Multicollinearity Test

Before conducting the analysis, independent variables should be examined for perfect collinearity, as is required for most models, to avoid, among other things, obtaining indeterminate coefficients and infinite standard errors (Manja, 2018). Based on Appendix 1 correlation matrix shows that corruption and political stability were highly collinear (0.8). Thus, considering Corruption as available of interest in the study, political stability variable was dropped.

5.3.1.2. Panel Root Test

Fisher test for panel unit root was employed to determine whether the used series had a unit root (i.e., non-stationary). Table 3 presents the results found.

Table 3: Fisher Test Results

Variable	**chi2(32)**	**Prob > chi2**
lnFDI	54.9655	0.0036**
lnCORR	51.9288	0.0144**
lnGDPPC	45.8944	0.0531
lnINFLA	57.3832	0.0038**
lnINFRA	402.8846	0.0000***
lnOPEN	75.9858	0.0000***
ln_LFDI	70.6892	0.0000***

Based on the results, GDP per Capita was found to be non-stationary at 5% significance level. The study employed the first differencing technique on GDP per capita to make it stationary.

5.3.1.3. Hausman Test for Panel Specification

To decide whether to use fixed effects or random effects model, the study used the Hausman Test determine the panel specification. The Chi-Square for the Hausman Test was found to be 4.15 and its p-value was 0.5275. Thus, since the value was greater than the chosen significance level (5%), the study adopted random effects model.

5.3.1.4. Wooldridge test for Autocorrelation

The study used Wooldridge test to first order autocorrelation. The f-statistic was found to be 3.105 with a p-value of 0.0999 we fail to reject null hypothesis and concluded that there was no presence of first order autocorrelation at 5% significance level.

5.3.1.5. Heteroscedasticity test

The study used Breusch-Pagan test for heteroscedasticity. The chi-square for the test was 4.75 with a p-value of 0.0294. Thus, the study concluded the presence of heteroscedasticity at 5 % significance level. To correct for heteroscedasticity, models were estimated using feasible generalized least squares to have robust standard errors. Robust standard errors are adjusted standard errors of the estimated coefficients to account for heteroscedasticity and/or serial correlation (Greene, 2012).

5.3.2. Analysis of econometric results

Having completed the diagnostic tests, the analysis investigated the effects of corruption on FDI in the SADC region. The analysis was done while separating for subobjectives of the study. Considering the violation of homoscedasticity assumption, the analysis used models as highlighted in the prior section. The estimated results from the models are estimated in the subsequent paragraphs.

Thereafter the study employed a method of moments quantile regression with random effects to examine the effect of corruption on FDI across the different volumes of FDI and Investigate whether an increase in market size can reduce the effects of corruption across different volumes of FDI.

5.3.2.1. Results of the Estimation of the random effects model (without interactive term)

The analysis first employed a random effects regression model to assess the effect of corruption on FDI in the SADC region while holding the homogenous assumption between corruption and FDI. The results are presented in table 4.

Table 4: Estimated Results of the random effects model without interactive term

Explanatory Variable	Coefficient	Robust std. err.	z	P>z
lnLFDI	0.926	0.025	36.62	0.000***
lnCORR	-0.469	0.185	-2.54	0.011**
lnINFRA	1.055	0.605	1.74	0.081*
lnOPEN	0.211	0.091	2.31	0.021**
DlnGDPPC	1.228	0.432	2.84	0.004***
lnINFLA	-0.117	0.06	-1.95	0.052**
Cons	1.609	0.81	1.99	0.047**

Number of Groups	16
Wald chi2(6)	1764.54
Prob > chi2	0.0000
R-squared (Overall)	0.8781

*Parentheses: *** p<0.01 * *p<0.05, * p<0.1,*

Estimated results in table 4 indicate the existence of a statistically significant negative relationship between corruption and foreign direct investment in the SADC region. Based on the results, 1% increase in corruption leads to a decrease in FDI of approximately by 0.469%, holding all other variables constant. This result confirms the hypothesis that corruption deters FDI. Additionally, the results showed statistically significant positive relationship between trade openness, lagged foreign direct investment and GDP per Capita with foreign direct investment. In contrast, it can be observed that the inflation rate exhibits a statistically significant negative influence on foreign direct investment (FDI). Lastly, the infrastructure variable demonstrates a positive effect on FDI, though with a lower significance level.

5.3.2.2. Results of the Estimation of the random effects model (with interactive term)

While maintaining the homogenous assumption between corruption and FDI, the random effects model was re-estimated having introduced the interactive term to investigate

whether an increase in market size can reduce the effects of corruption on FDI. The results are highlighted in table 5.

Table 5: Estimated Results of the random effects model with interactive term

Explanatory Variable	Coefficient	Robust std. err.	z	P>z
lnLFDI	0.926	0.025	36.590	0.000***
lnCORR	-0.429	0.138	-3.120	0.002***
lnINFRA	0.941	0.656	1.430	0.152
lnOPEN	0.196	0.082	2.380	0.017**
DlnGDPPC	-5.097	4.115	-1.240	0.216
lnINFLA	-0.121	0.059	-2.050	0.041**
GDPCORR	1.871	1.191	1.570	0.116
_cons	1.632	0.841	1.940	0.052*

Number of Groups	16
Wald chi2(7)	2450.73
Prob > chi2	0.0000
R-squared (Overall)	0.8812

*Parentheses: *** p<0.01 * *p<0.05, * p<0.1,*

Results in Table 5 include an interaction term (GDPCORR) to investigate whether an increase in market size modifies the relationship between corruption and foreign direct investment (FDI). The results showed that a 1% increase in corruption would result in a 0.429% estimated decrease in FDI, all else being equal. However, the coefficient of the interaction term was 1.871 but insignificant, showing that corruption losses significance when interacted with GDP per Capita. This implies that expansion in market size may mitigate the adverse effects of corruption on FDI.

5.3.2.3. Results of the Estimation of the MM-QR (without interactive term)

Following model estimations based on the homogonous assumption between corruption and FDI, the analysis assessed the effect of corruption on FDI under the heterogonous

assumption. This was done to investigate whether the effect of corruption on FDI differs across the different volumes of FDI. The study employed a method of moments quantile regression to assess the effects. Table 6 present the results.

Table 6: Estimated Results of MM-QR without interactive term

Explanatory Variable	**0.25**	**0.5**	**0.75**	**0.95**
lnLFDI	0.946***	0.928***	0.907***	0.878***
	(35.66)	(33.86)	(25.20)	(15.85)
lnCORR	-0.477**	-0.470*	-0.462	-0.450
	(-2.66)	(-2.20)	(-1.48)	(-0.95)
lnINFRA	0.933	1.041*	1.172	1.348
	(1.82)	(2.07)	(1.83)	(1.40)
lnOPEN	0.0348	0.190	0.379*	0.634*
	(0.21)	(1.23)	(2.15)	(2.55)
DlnGDPPC	1.129**	1.216*	1.323	1.467
	(2.63)	(2.58)	(1.94)	(1.38)
lnINFLA	-0.102	-0.116*	-0.133*	-0.155
	(-1.94)	(-2.46)	(-2.45)	(-1.93)
Cons	1.579	1.605	1.637	1.679
	(1.48)	(1.77)	(1.71)	(1.23)

*Parentheses: *** p<0.01 * *p<0.05, * p<0.1*

Results in table 6 show a diminishing impact of corruption on foreign direct investment (FDI) as from 25th percentile to 95th percentile. This observation implies that the impact of corruption on foreign direct investment (FDI) may be diminished in countries that already attract significant levels of FDI. However, it is worth noting that the coefficient loses its statistical significance in the uppermost quantile. Precisely, the coefficients associated with the corruption exhibit negative values across all quantiles. However, statistical significance is observed solely at the 25% and 50% quantiles. On the other hand, the coefficient for lagged FDI remains significant across all percentiles but experiences a modest decrease

from 25th percentile to 95th percentile. This implies that the influence of lagged FDI on current FDI may exhibit a slight reduction for nations that receive higher levels of FDI.

5.3.2.4. Results of the Estimation of the MM-QR (with interactive term)

Lastly, the analysis assessed whether an increase in market size can reduce the effects of corruption across different volumes of FDI. The analysis was done under the same heterogonous assumption using a method of moments quantile regression but with an interactive term added to the model. Table 7 portray the results.

Table 7:: Estimated Results of MM-QR with interactive term

Explanatory Variable	**0.25**	**0.5**	**0.75**	**0.95**
lnLFDI	0.944***	0.929***	0.908***	0.874***
	(35.75)	(34.40)	(26.07)	(15.32)
lnCORR	-0.479**	-0.437*	-0.380	-0.286
	(-2.59)	(-2.29)	(-1.54)	(-0.71)
lnINFRA	0.905	0.935	0.975	1.041
	(1.77)	(1.81)	(1.50)	(1.02)
lnOPEN	0.0532	0.173	0.331*	0.596*
	(0.32)	(1.15)	(2.04)	(2.53)
DlnGDPPC	-1.930	-4.587	-8.115	-14.00
	(-0.45)	(-1.11)	(-1.68)	(-1.87)
lnINFLA	-0.111*	-0.119**	-0.130*	-0.148
	(-2.16)	(-2.59)	(-2.51)	(-1.78)
GDPCORR	0.837	1.705	2.856*	4.778*
	(0.62)	(1.38)	(2.06)	(2.23)
Cons	1.616	1.629	1.646	1.675
	(1.49)	(1.76)	(1.77)	(1.18)

Parentheses: *** p<0.01 * *p<0.05, * p<0.1

According to the findings presented in Table 7, the interaction term GDPCORR is statistically significant at the 75th and 95th percentiles. Based on the found positive coefficients, it shows that an increase in market size at a certain level of corruption attracts more FDI. Comparing the 75th and 95th percentiles, a more substantial effect exists at the 95th percentile. This implies that the result is even more substantial in the larger economies. Lastly, it is worth noting that the impact of previous foreign direct investment remains significant across all quantiles.

5.4. Discussion of the Results

The results provide a complex narrative regarding the relationship between corruption, market size, and Foreign Direct Investment (FDI). Contrary to the traditional view that corruption explicitly deters FDI, the findings suggest that the impact of corruption on FDI inflows is significantly altered by the size of the market. The study challenges the conventional knowledge within economic literature that views corruption solely as a barrier to FDI. Consistent with the theories of Dunning (1980) on the eclectic paradigm, it has been found that while corruption poses a deterrent to FDI, its negative impact is less pronounced in larger markets. This suggests that the locational advantages of larger markets may offset the risks associated with corruption, a gap that existing theoretical models often overlook. The findings propose the incorporation of market size as a critical factor when developing anticorruption policies to attract FDI.

The random effects model without the interactive term (Table 4) shows that corruption has a statistically significant negative coefficient, which suggests that more corruption hurts FDI inflows. Furthermore, Inflation, lagged FDI and trade openness show significant coefficients, meaning these factors positively impact FDI. These findings align with prior empirical works by Asiedu (2002), Wei (2000), and Fischer (1993), which similarly concluded that corruption, trade openness, and macroeconomic instability exert a substantial impact on foreign direct investment. When the interactive term (GDPCORR) was added to the random effects model (Table 5), corruption losses significance when interacted with GDP per Capita and the coefficient was found to be positive. This implied

increase market size can alter the impact of corruption on FDI. The result support the anticipated outcome and previous research findings by Lee and Azman-Saini in 2012.
Turning to the MM-QR model without the interactive term (Table 6), it becomes apparent that the effect of corruption on FDI is contingent on the percentile. Corruption exerts a more significant influence on deterring FDI in lower percentiles, which correspond to smaller FDI volumes. However, the adverse impact of corruption weakens and loses statistical significance in higher percentiles, which correspond to larger FDI volumes. This suggests that larger investors may possess the capability to better confront the obstacles presented by corruption. These outcomes are consistent with the proposition that market size is pivotal in attracting FDI and potentially mitigating the impact of corruption (Li and Liu, 2005). Integrating the interaction term into the MM-QR model (Table 7) supports the notion that an increase in market size may potentially alleviate the negative consequences of corruption on FDI. As the results demonstrate, the interaction term becomes statistically significant at the 75^{th} and 95^{th} percentiles. This suggest that in bigger and more established markets, the size of the market is stronger than the negative impact of corruption on FDI. In simpler terms, the possibility of high profits and opportunities in a big market may be enough to attract foreign investment, even when corruption is present. The presence higher coefficient at 95^{th} percentiles show that this effect is even more substantial in the larger economies.

The findings of this study highlight the significance of employing a MM-QR methodology alongside conventional panel data models (Koenker and Hallock, 2001) to gain a more comprehensive understanding of the correlation between corruption, market size, and foreign direct investment (FDI). All in all, the study further emphasizes the complexity of these relationships and underscores the need for tailored policy recommendations based on specific market characteristics and FDI levels.

5.5. Conclusion of Results

In summary, Chapter 5 provided valuable insights into the impact of corruption on foreign direct investment (FDI) in the Southern African Development Community (SADC) region. The findings of this study have the potential to assist policymakers in formulating strategies

that can effectively combat corruption and promote foreign direct investment (FDI) within the SADC region.

CHAPTER SIX

CONCLUSIONS AND POLICY IMPLICATIONS

6.1 Introduction

This chapter presents the consolidated research findings of the study, accompanied by conclusions that hold relevance for policymakers. The subsequent sections that ensue this introduction encompass policy implications, recommendations, and the conclusion of the study. The chapter also provides recommendations for future research.

6.2. Summary of the Findings

The primary aim of the study was to investigate the correlation between corruption, market size, and foreign direct investment (FDI) by employing a panel data set encompassing countries in the SADC region. The study employed a comprehensive approach by utilising the Random Effects (RE) regression and a Method of Moments Quantile Regression (MM-QR).

The results indicate that Foreign Direct Investment (FDI) is positively affected by its previous values, the level of trade openness, and the growth in per capita GDP. Conversely, corruption and the inflation rate exert a negative influence on FDI. The findings of this study align with prior empirical investigations conducted by Asiedu (2002), Wei (2000), and Fischer (1993), thereby substantiating the proposition that increased levels of corruption act as a deterrent to foreign direct investment. Additionally, the MM-QR illustrated that the influence of corruption on foreign direct investment (FDI) is particularly noticeable in nations with lower FDI levels, implying that corruption has a more substantial deterrent effect on smaller foreign investors.

The incorporation of the interaction term involving corruption and market size (GDPCORR) unveils a distinct dynamic. The term in question exhibits statistical significance at the 75^{th} and 95^{th} percentiles of the distribution of FDI. This suggests that in countries with a larger market size, the detrimental effect of corruption on FDI is lessened or reversed.

6.3. Policy Implications and Recommendations

From a policy standpoint, the findings underscore the imperative for SADC nations to amend and adopt inclusive anti-corruption policies. These policies include SADC Protocol Against Corruption (2001), SADC Strategy on Good Governance and Strengthening of the Rule of Law (2014-2020), African Union Convention on Preventing and Combating Corruption, and other country specific policies like Malawi National Anti-Corruption Strategy. Given the empirical evidence indicating that corruption exerts a more substantial deterrent effect on smaller foreign investors, it is reasonable to assert that directing efforts towards mitigating corruption could yield notable outcomes in terms of attracting a diverse array of foreign investors. This has the potential to yield wider economic advantages, encompassing the transfer of technology, the generation of employment opportunities, and the augmentation of competition.

In contrast, nations characterised by substantial market size continue to draw considerable foreign investment, even in the presence of higher levels of corruption. These nations ought to prioritise the implementation of anti-corruption strategies, while simultaneously capitalising on their substantial market size to entice foreign investments. The implementation of policies aimed at increasing market attractiveness, such as the enhancement of business facilitation, the liberalisation of trade and investment regulations, and the promotion of infrastructure development, can potentially yield positive outcomes when combined with anti-corruption initiatives.

Moreover, the statistical significance of the interaction term GDPCORR at higher percentiles suggests that there may be a need to customise corruption-related policies according to the current level of the market size. In the case of countries with smaller

market sizes, it may be necessary for policymakers to place a greater emphasis on the reduction of corruption. Conversely, for countries with larger market sizes, a more effective approach may involve implementing a combination of anti-corruption measures and policies aimed at utilizing market size opportunities such tax holidays.

It is vital to consider the complex and broad nature of the dynamics investigated in this research. Hence, it is necessary to acknowledge that although the policy recommendations derived from this research can offer a broad framework, they must be tailored and enhanced to align with the distinct socio-economic circumstances and institutional environments prevalent in individual countries.

6.4. Conclusion

Overall, the results demonstrate how crucial it is for SADC nations to combat corruption to attract more FDI. To maximise FDI for economic growth and development, the region must implement anti-corruption policies, foster a culture of trade openness, and enhance the market sizes.

6.5. Direction for Further Research

Future research could further explore the interaction effects of corruption and other factors on FDI, such as political stability, institutional quality, or education levels. This could provide more nuanced insights and further enrich the policy implications derived from such studies.

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APPENDICES

Appendix 1: Correlation Matrix

```
. corr lnFDI_USD lnLFDI lnCORR lnINFRA lnOPEN DlnGDPPC lnINFLA lnPS
(obs=56)
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	lnFDI_~D	lnLFDI	lnCORR	lnINFRA	lnOPEN	DlnGDPPC	lnINFLA	lnPS
lnFDI_USD	1.0000							
lnLFDI	0.8508	1.0000						
lnCORR	-0.1369	-0.0684	1.0000					
lnINFRA	0.0713	0.1362	0.1013	1.0000				
lnOPEN	-0.0811	-0.1423	0.5931	-0.0377	1.0000			
DlnGDPPC	0.1659	-0.0145	-0.2787	0.0420	-0.0543	1.0000		
lnINFLA	0.0731	0.0865	-0.5471	0.0967	-0.3579	0.0788	1.0000	
lnPS	0.0162	0.0168	0.7657	0.1110	0.5494	-0.0832	-0.5802	1.0000

APPENDIX 2: Corruption Perception Ranking

Table 8: CPI Ranking In SADC

COUNTRY NAME	SCORE (0 - 100)	RANK
SEYCHELLES	66	1
BOTSWANA	60	2
MAURITIUS	53	3
NAMIBIA	51	4
SOUTH AFRICA	44	5
LESOTHO	41	6
TANZANIA	38	7
ESWATINI	33	8
ZAMBIA	33	9
MALAWI	30	10
ANGOLA	27	11
MADAGASCAR	25	12
MOZAMBIQUE	25	13
ZIMBABWE	24	14
COMOROS	21	15
CONGO, DEM. REP.	18	16

APPENDIX 3: Rationale on the Explanatory Variables

Variable	Rationale
FDI	Variable of interest
Gross Domestic Product per capita (USD, Billion)	FDI flows may be impacted by a country's economy's size because larger economies may present more investment opportunities and higher potential returns. According to the eclectic paradigm, FDI can be attracted by a host country's location-specific advantages, such as its natural resources, human capital, or infrastructure.
Economic Openness (Percent)	Location advantages can be significantly influenced by economic openness, which may also have an impact on FDI flows.
Economic Stability (Percent)	The gravity model states that economic variables have an impact on FDI flows. One of the economic variables that can influence FDI flows is the inflation rate.
CPI (score)	The institutional economics theory suggests that institutional quality can affect the transaction costs and risks of investing in a foreign country, which can in turn affect FDI flows.
Political Stability Index	Institutional economics theory suggests that FDI is attracted to countries with strong and stable environment that provide a predictable and transparent business environment.
Infrastructure Index	The costs and risks of conducting business abroad can be influenced by the standard and accessibility of infrastructure, including communication and transportation networks. According to the eclectic paradigm, foreign investors may benefit from location-specific advantages in nations with better infrastructure.

APPENDIX 4: FDI Inflows in SADC region