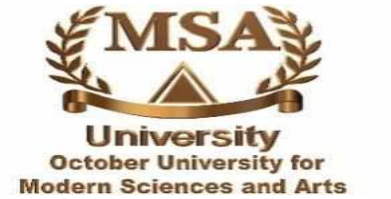

October University of Modern Sciences and Arts

Faculty of Management sciences

GRAD II

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"Unveiling the Transparency-FDI Nexus: A Cross-Country Analysis of BRICS Countries"

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"Spring 2024"

Declaration

I declare that:

1-This project is the final result of my own work and full acknowledgement that has been given in the references to all sources of data and information whether printed or electronic.

2- No copies of this project have been submitted for any qualification or degree or for any other educational institutions, or any other universities.

3- The word count of this project is 13,3395 words

Names of Student	Student ID	Signature
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Acknowledgement:

I would like to extend my gratitude and admiration to Prof. Dr. Doaa Salman, the Head of the Economics Department at Modern Sciences and Arts University in Cairo (MSA), for her invaluable guidance and supervision. Her unwavering motivation, dedication, patience, and perseverance participated a pivotal role in the successful completion of my project. The consistent assistance and drive she provided greatly contributed to my successful completion of this work.

Moreover, I would like to express our gratitude to our university MSA for the facilities it provided. Furthermore, I would like to extend my profound appreciation and thanks to our Dean, Prof. Dr. Sayed Nagy.

In addition, I would like to express my gratitude to Dr. Mai Mohamed Yasser, a highly recognised economist, for graciously agreeing to review my paper despite her many commitments. Furthermore, I would want to express my gratitude to my economics professors and teaching assistants for their significant contributions in expanding my knowledge and providing me with a valuable opportunity to conduct research. Lastly, I would want to express my gratitude to my family and friends who have provided unwavering support and constant motivation throughout my journey. Their assistance has been important in enabling me to successfully do my last graduation project.

Abstract

Corruption is seen as a crucial factor that investors take into account when making judgements. Therefore, This study examines the relation between corruption and foreign direct investment (FDI) levels in the BRICS countries, namely Brazil, Russia, India, China, and South Africa, from 2002 to 2022. This research study intends to investigate the impact of corruption on the levels of foreign direct investment (FDI) in the BRICS states, considering their rapid ascent and the attention they have received on the international stage. In order to examine the impact of corruption on specific countries, an ARDL&OLS model is performed on each of the five states. Corruption is significant in many nations, although there is an inverse association between corruption and foreign direct investment (FDI) in Russia, India, China, and South Africa. However, in Brazil, there is a positive relation between corruption and FDI.

Keywords: Corruption, Foreign Direct Investment (FDI), BRICS Countries, Transparency, Political Stability

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1. Chapter One: Research Overview

1.1 Introduction

Foreign Direct Investment (FDI) plays a crucial role in driving economic growth, supporting knowledge transfer, and promoting cross-border partnerships in the ever-changing global economic landscape characterized by interdependence. Over time, the worldwide movement of foreign direct investment (FDI) has experienced significant growth, emerging as a crucial factor in influencing the economic trajectories of countries.

The worldwide investments in Foreign Direct Investment have experienced remarkable expansion, indicating the growing interdependence of economies. Recent data indicates that worldwide foreign direct investment (FDI) flows surpassed 1.74 trillion USD in 2022 (Worldbank, 2022), highlighting the importance of international capital mobility in today's economic environment. Notably, the top FDI recipient countries, including the United States, China, and European nations, have attracted substantial investments, shaping the global economic landscape.

For instance, the United States, a major FDI destination, continues to draw significant investments across various sectors, fostering innovation and economic development. China, on the other hand, has become a prominent player, not only as a recipient but also as a source of outbound FDI, reflecting its expanding influence on the global stage. European countries, with their well-established markets and stable environments, remain attractive to foreign investors seeking diverse opportunities.

In parallel, the BRICS nations—Brazil, Russia, India, China, and South Africa—have assumed crucial roles, drawing significant foreign investments that have propelled their economic progress. Brazil, with its abundant natural resources and growing consumer market, has attracted FDI across industries such as energy, agriculture, and technology. Russia, with its vast energy reserves, has seen substantial investments in its extractive industries. India, with its large and dynamic consumer base, has become a hub for FDI in technology, manufacturing, and services. China, with its rapid economic growth and manufacturing prowess, has been a magnet for foreign capital across sectors. South Africa, with its diverse economy, has attracted investments in mining, finance, and infrastructure.

Against this backdrop, understanding the nuances of transparency becomes paramount. Transparency, encompassing clear regulations, governance structures, and accessible information, is widely recognized as a crucial factor in building investor trust and influencing investment choices globally. The BRICS countries, with their varied socio-economic and political circumstances, offer an intriguing platform for a thorough examination of how transparency impacts FDI trends.

This study aims to reveal the intricate correlation between transparency and foreign direct investment in the context of the BRICS countries. Through the use of a meticulous scholarly methodology, our objective is to not only enhance comprehension of the unique dynamics inside each BRICS country but also to provide insights into broader theoretical frameworks that encompass the intricate relationship between transparency and foreign direct investment (FDI) on

a global level.

This research will delve into the regulatory frameworks, governance structures, and investment landscapes of the BRICS countries using recognized approaches and empirical data. The academic rigor of this research is based on its dedication to thoroughly examine transparency indicators, FDI patterns, and contextual factors, using strong statistical models to obtain significant insights.

Our main objective in this academic endeavor is to connect existing gaps in knowledge, present findings based on empirical data, and establish a basis for policymaking that relies on evidence. This research aims to explore the connection between transparency and foreign direct investment in the BRICS nations from 2002 to 2022. Its goal is to provide insights for both academic literature and stakeholders in order to promote investment environments that are transparent, robust, and supportive of sustainable economic growth.

1.2 Research Questions

RQ.1: How does the level of corruption influence Foreign Direct Investment (FDI) in the BRICS nations?

RQ.2: What role does regulatory quality play in shaping FDI patterns within the BRICS countries?

RQ.3: To what extent does the rule of law impact FDI attractiveness in the BRICS region?

RQ.4: How does political stability contribute to the variation in FDI inflows among the BRICS nations?

RQ.5: What is the relationship between inflation rates and FDI levels in the BRICS countries?

RQ.6: How do the effectiveness and efficiency of government institutions affect FDI trends in the BRICS region?

RQ.7: To what extent does the Voice and Accountability Index influence FDI decisions in the BRICS nations?

RQ.8: What is the impact of GDP growth on the foreign direct investment landscape in the BRICS countries?

1.3 Research Objectives

RO.1: To assess the impact of corruption levels on FDI inflows in the BRICS nations.

RO.2: To examine the relationship between regulatory quality and FDI attractiveness in the BRICS region

RO.3: To analyze the influence of the rule of law on FDI patterns within the BRICS countries.

RO.4: To investigate the correlation between political stability and FDI variations in the BRICS nations.

RO.5: To explore the relationship between inflation rates and FDI levels in the BRICS countries.

RO.6: To assess how government effectiveness and efficiency contribute to FDI trends in the BRICS region.

RO.7: To analyze the influence of the Voice and Accountability Index on FDI decisions in the BRICS nations.

RO.8: To understand the impact of GDP growth on the foreign direct investment landscape in the BRICS countries.

1.4 Hypothesis

H1: There is a negative relationship between the level of corruption and FDI inflows in the BRICS countries.

H2: Political stability has a positive impact on FDI inflows among the BRICS countries.

H3: Regulatory quality has a positive impact on FDI attractiveness in the BRICS region.

H4: The rule of law does have a significant correlation with FDI patterns within the BRICS nations.

H5: Government effectiveness has significant impact on FDI trends in the BRICS region.

H6: The Voice and Accountability Index does significantly influence FDI decisions in the BRICS nations.

H7: There is a positive relationship between GDP growth and the foreign direct investment landscape in the BRICS countries.

H8: Inflation rates do have a significant impact on FDI levels in the BRICS countries.

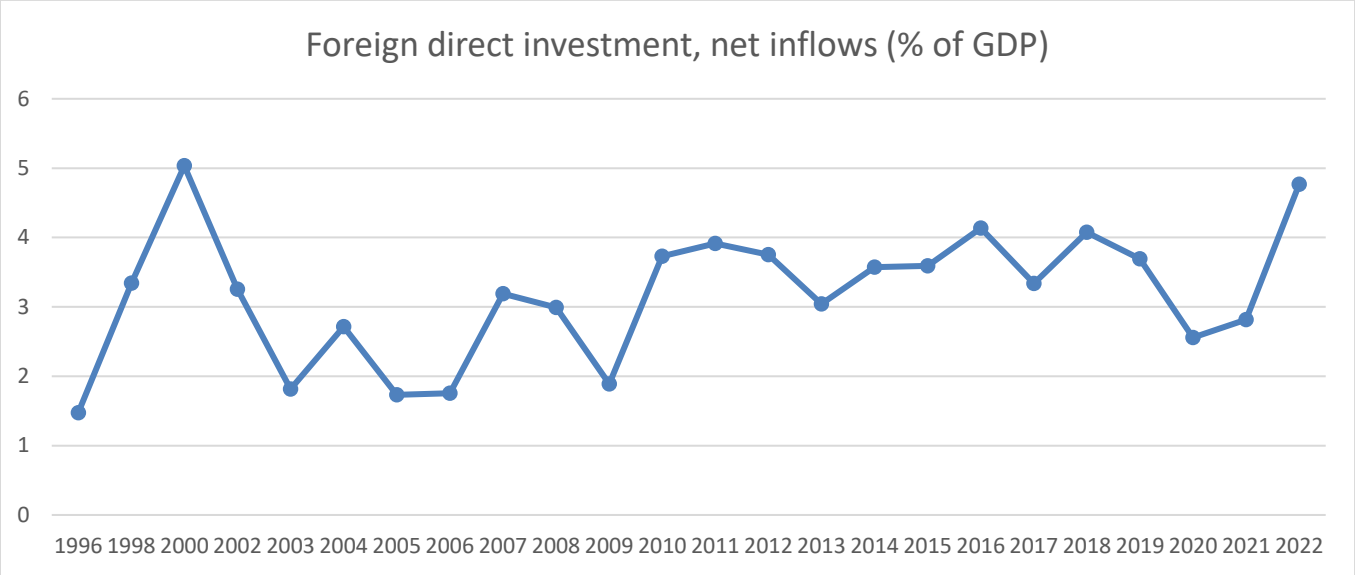
1.5 Research Gap:

While existing literature explores the relationship between transparency and FDI, there is a noticeable research gap in understanding the nuanced impact of specific factors, such as control of corruption, regulatory quality, rule of law, political stability, inflation, government effectiveness, and accountability, on FDI patterns within the diverse socio-economic and political contexts of the BRICS nations. This study aims to address this research gap by conducting a comprehensive analysis of these factors and their influence on FDI trends in the BRICS region from 2002 to 2022.

1.6 Research Background

Knowing that the main purpose of this paper is to reveal the relationship between transparency and foreign direct investment among the BRICS countries. Hence, it is important to explore the proportion of foreign direct investment in the national product in the BRICS countries to clarify the fluctuations that occurred in foreign direct investment from 1996 to 2022. Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor (Worl Bank, 2023).

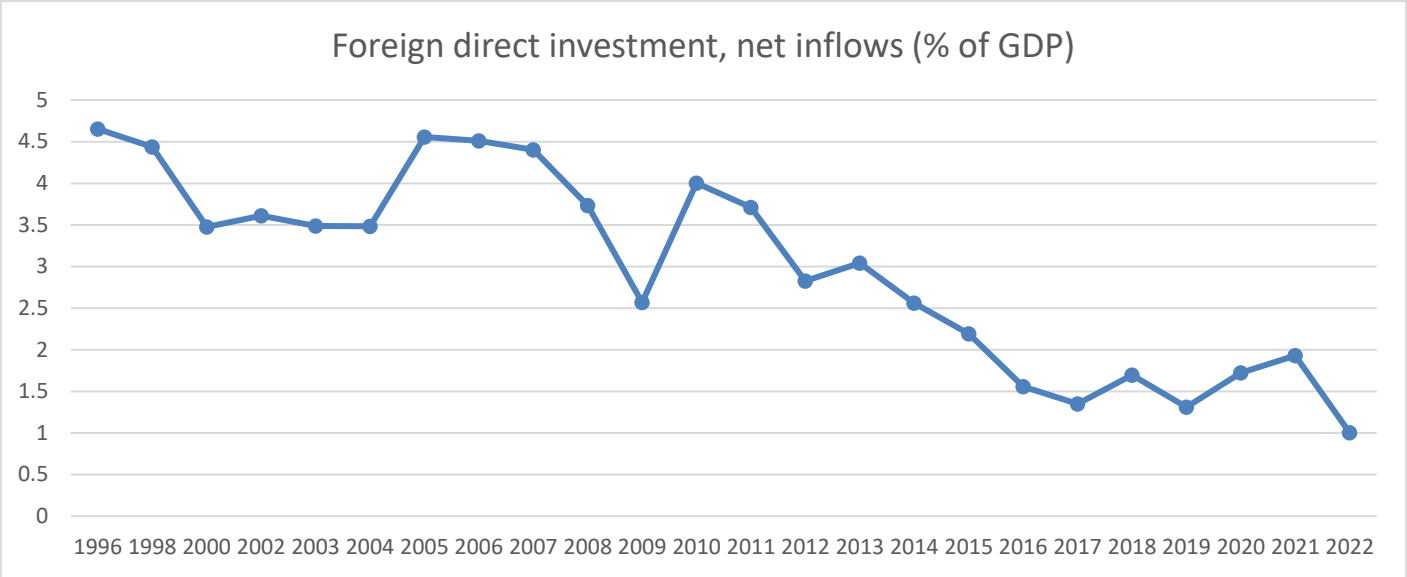
Figure 1: FDI(% of GDP) in Brazil (from 1996 to 2022)



Source: World Bank (2023)

Brazil is considered one of the distinguished countries in terms of its natural resources. Minerals and the natural environment, such as the Amazon forest and large area of agricultural land, are a good source of profit for Brazil. But in recent decades, Brazil has faced many fluctuations in the proportion of foreign direct investment (Michael Kaczmarski, 2014). The country is facing a long-term slowdown in industrial production, while job creation is at its slowest level since 1999. As shown in Figure 1, it is noted that there was a sharp decline in the proportion of foreign direct investment at the beginning of the new millennium from 2000 to 2002. This is due to the withdrawal of Many American investors, who make up the largest percentage of investors in Brazil, are responsible for the events of September 11 (de Castro, Fernandes, & Campos, 2013).

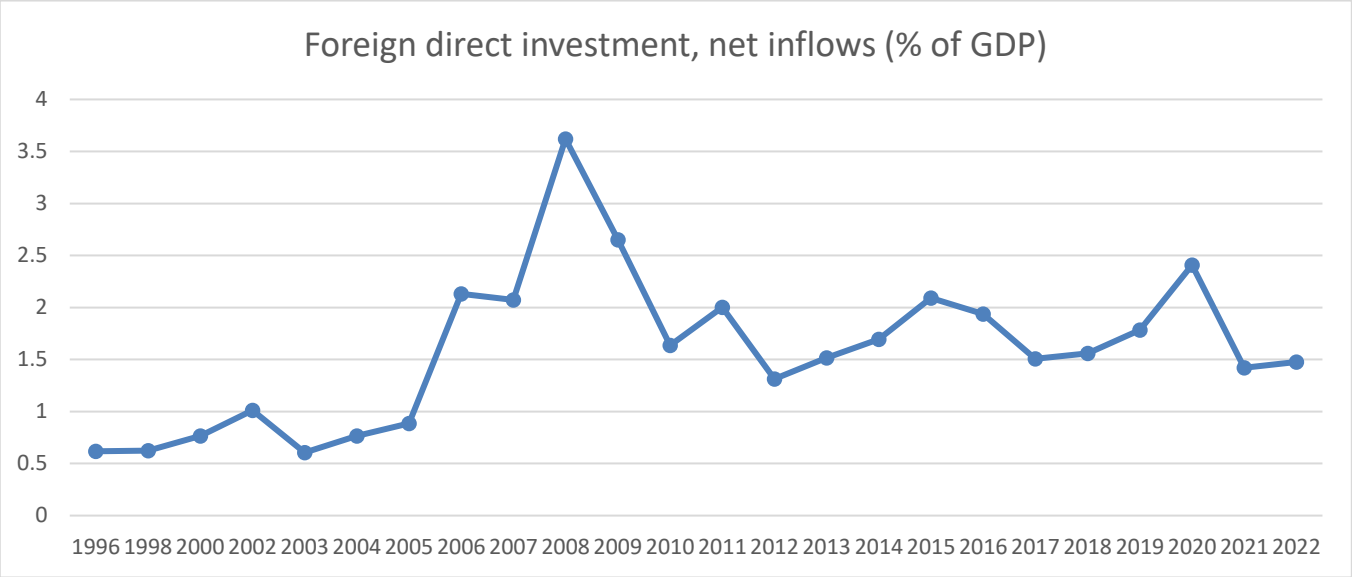
Figure 2: FDI(% of GDP) in China (from 1996 to 2022)



Source: World Bank (2023)

With a population of more than 2 billion people, China is considered the most populous country in terms of labor availability. However, as shown in Figure 2, it can be said that China does not depend on foreign investment to finance its development projects, as FDI does not exceed about 3% of total investment (Chi Lu, 2023). But we can also see a sharp decline from the beginning of 2020, and this is due to the Corona crisis, of which China was one of the most affected, this effect had been since the US Federal Reserve's sharp policy tightening raised the risk-free rate

Figure 3: FDI(% of GDP) in India (from 1996 to 2022)

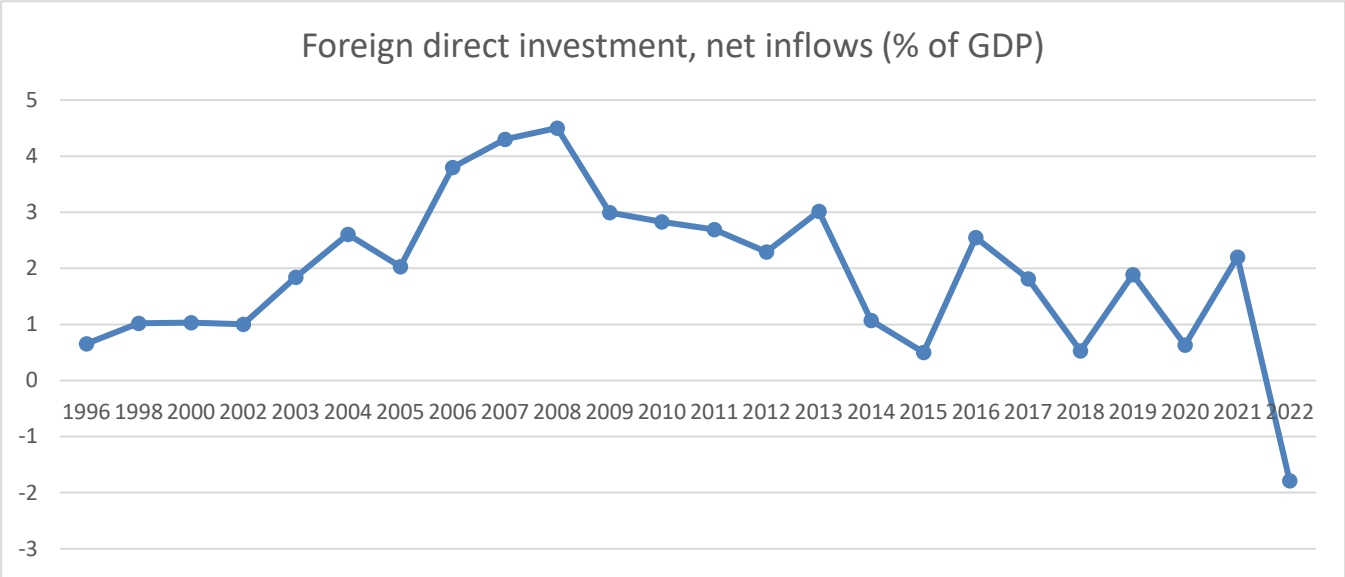


Source: World Bank (2023)

Since 2000, the Indian government has implemented crucial changes to FDI rules to enhance the nation's appeal as a highly desirable investment destination. The influx of foreign direct investment (FDI) into India has seen a significant surge subsequent to the reforms implemented in 1991 (Pawar, 2011).

Nevertheless, with the implementation of these reforms, India has seen fluctuations in the inflow of foreign direct investment (FDI) over the years. India has experienced fluctuations in the percentage of foreign direct investment (FDI) inflows on multiple occasions. For instance, there was a decline in FDI from 2001 to 2004 due to various factors such as the Gujarat earthquakes, the terrorist attacks on the World Trade Centre and Indian Parliament in 2001, and the global economic downturn following the 2008 US Subprime Crisis and the 2012_13 Euro Crisis. As a result, there was a worldwide drop in investor confidence (P. Sai Rani & Ghosh, 2021).

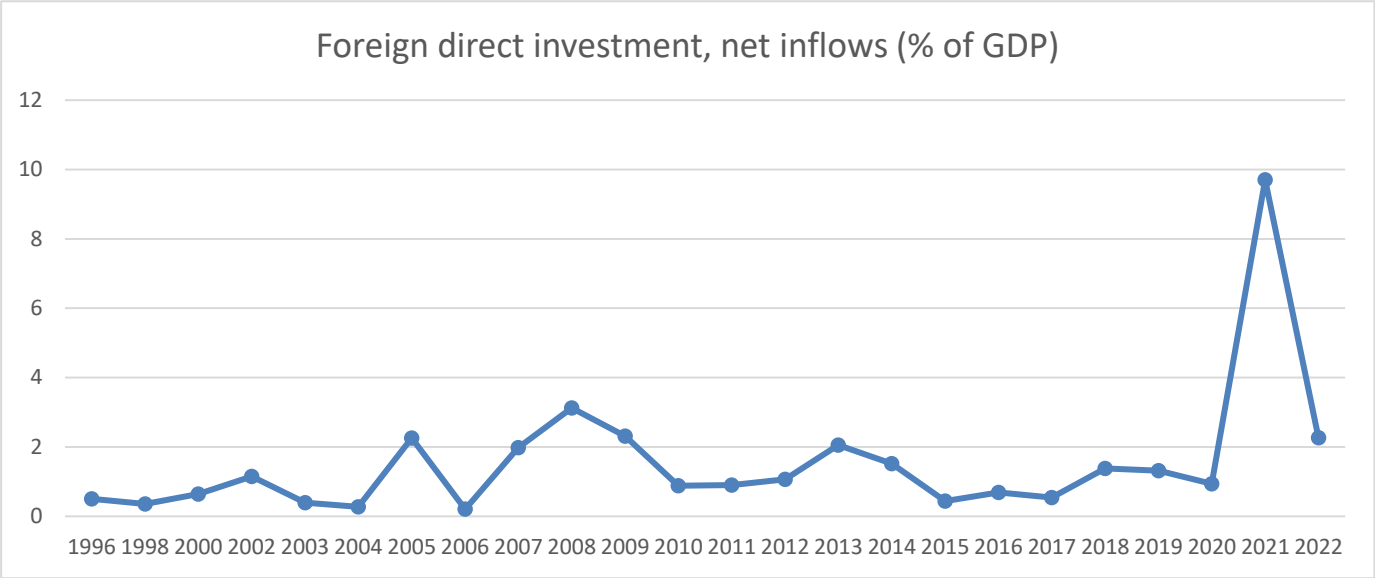
Figure 4: FDI(% of GDP) in Russia (from 1996 to 2022)



Source: World Bank (2023)

From 2000–2013, Russia's FDI as a proportion of GDP was very stable, fluctuating by around 1-2%. Following 2014, however, things took a sharp turn for the worst due to geopolitical tensions and international sanctions brought about by Russia's invasion of Crimea. Factors like as shifting global oil prices and continuing sanctions continued to impact foreign direct investment (FDI), which remained volatile despite a steady recovery in the ensuing years. The worldwide economic slump after the COVID-19 pandemic, geopolitical uncertainty, and the effects of sanctions may have contributed to the sharp decline in foreign direct investment (FDI) in the years following 2020. An indication of divestiture or capital flight might be the negative FDI values in certain years (Kuznetsov, 2021).

Figure 5: FDI(% of GDP) in South African (from 1996 to 2022)



Source: World Bank (2023)

Approximately US$37.6 billion in foreign direct investment (FDI) poured into South Africa in 2021, according to a March 2022 report by the South African Reserve Bank. This is a substantial rise from the foreign direct investment (FDI) inflows of about US$3.1 billion recorded in 2020. The country's extended COVID-19 lockdowns, which prevented potential investors from investing, and a major cross-border transaction, in which Prosus NV acquired about 45% of Naspers Ltd from the current shareholders of the latter, are the main reasons for the increase in foreign direct investment (FDI) for 2021 (Goldman & Potter, 2022).

2. Chapter Two: Literature Review

Scholarly investigation on the connection between openness and FDI has grown in importance in the ever-changing field of international economics. More and more, people are realizing that foreign direct investment (FDI) patterns and the openness of economic and regulatory frameworks are two of the most important factors that determine a country's economic fate. Investors are looking for places where legislation, governance frameworks, and information are crystal clear as globalization continues. The purpose of this literature review is to shed light on the complex relationships between transparency and foreign direct investment (FDI) by exploring its many facets. The purpose of this study is to add to the current body of knowledge on the topic of transparency's impact on foreign direct investment (FDI) patterns worldwide by combining and analyzing relevant studies.

2.1 Theoretical Framework

2.1.1 Political Risk Theory:

Political risk assessment has emerged as a rapidly expanding field of study within the realm of international business. The subject focuses largely on identifying, analyzing, and managing the sociopolitical and governmental restrictions on foreign investment. It has thrived in response to the worldwide upheaval of recent years. The building of a theoretical foundation is a crucial step in the growth of any emerging discipline, as it serves as a basis for future study and advancements (Simon, J. D, 1984). This theory is particularly relevant when examining the impact of political stability on FDI. It emphasizes that political stability reduces uncertainties related to political factors, making a country more attractive to foreign investors. A stable political environment is associated with lower political risk, encouraging FDI (Erb, Harvey & Viskanta, 1996).

2.1.2 Rent-Seeking Theory:

The term "rent-seeking" comes from the field of economics and describes when people or organizations try to enrich themselves at the expense of others. It entails gaining financial advantages not via hard work but by influencing public policy or social institutions. Lobbying for governmental favors, establishing monopolies, or manipulating rules are common examples of rent-seeking actions (Lambsdorff, 2002).

An early economic tool for simulating public sector corruption was the rent-seeking hypothesis. It argues that lobbying involves wasting resources in the struggle for preferential treatment, hence corruption is the lesser of two evils compared to lobbying (Lambsdorff, 2002).

Although economist Gordon Tullock first used the phrase "rent-seeking" in 1967, the idea really dates back to the writings of Adam Smith, John Stuart Mill, and David Ricardo. Economic rent was a topic of discussion among these economists; it was defined as the profit made by production elements over and above what was required to maintain their present usage (Gordon Tullock, 1967).

As economists sought for methods for people and companies to amass money outside of the market, rent-seeking rose to prominence in the twentieth century. An further economist linked to the Public Choice School, James M. Buchanan, elaborated on the idea.

Market distortions may be better understood and policies can be better crafted to foster fair competition and economic efficiency if economists and policymakers have a firm grasp of rent-seeking behavior. It stresses the significance of open and equitable regulatory frameworks in attracting FDI that is motivated by real economic concerns rather than rent-seeking (Lambsdorff, 2002).

2.1.3 Institutional Theory:

Institutional theory is instrumental in understanding the role of formal and informal structures in shaping behavior and outcomes within a society (Scott, 1995). When applied to the Transparency-FDI Nexus, Institutional Theory delves into how the formal institutions, such as legal frameworks and regulatory bodies, and informal institutions, like cultural norms, influence the transparency landscape. Countries with well-established institutions are likely to exhibit higher levels of transparency, which, in turn, can attract foreign direct investment (North, 1990).

2.1.4 Dependency Theory:

Dependency theory provides a lens through which to analyze the economic relationships between developed and developing countries (Frank, 1966). In the context of the Transparency-FDI Nexus in BRICS countries, Dependency Theory allows for an exploration of how economic dependencies and power imbalances influence the establishment of transparent business environments. Countries with stronger economic positions within the BRICS group may have more resources to invest in transparency measures, potentially affecting the dynamics of foreign direct investment compared to their economically weaker counterparts.

These additional theories contribute to the theoretical framework by broadening the perspective on the factors influencing the transparency-FDI relationship in BRICS countries. They offer insights into the underlying institutional dynamics and economic dependencies that shape the attractiveness of these nations for foreign investors.

2.2 Empirical Framework

2.2.1 Control of Corruption and Foreign Direct Investment

The 2002 study article "Corruption and Foreign Direct Investment" was written by Mohsin Habib and Leon Zurawicki. The article delves into the effects of corruption on FDI and assesses the extent to which corruption exists in the host nation. The authors draw the conclusion that corruption is morally reprehensible and may lead to operational inefficiencies, which is why most international investors stay away from it (Habib & Zurawicki, 2002).

By looking at the host country's corruption level and the absolute difference between the home and host countries' corruption levels, Habib and Zurawicki determined that corruption affects foreign direct investment (FDI). Their research showed that international investors stay away from corrupt

practices because of the negative impact it has on operations. The authors also came to the conclusion that FDI is negatively affected by corruption.

Corruption has a detrimental effect on foreign direct investment, and this research gives proof of that. In order to determine how corruption affects foreign direct investment (FDI), the authors analyzed data from 69 different nations and a variety of criteria. Among these considerations are the following: the degree of corruption in the host nation; the magnitude of the corruption gap between the home and host countries; the extent to which the government steps in; entrance obstacles; the nature of the competition; and the benefits of location (Habib & Zurawicki, 2002).

Other article, analyses the correlation between corruption and foreign direct investment (FDI), discussing the contrasting perspectives on the impact of corruption on FDI. There is a debate on whether corruption can help attract foreign direct investment (FDI) by facilitating government processes, or if it really hinders economic efficiency and leads to negative consequences. The paper utilises empirical analysis, using bilateral FDI statistics from the OECD and corruption control measures from the World Bank. It centres around two notable occurrences: the disclosure of the Panama Papers, which led to an escalation in corruption, and the enforcement of the OECD Anti-Bribery Convention, which resulted in a reduction in corruption. The results indicate that there is a positive relationship between corruption and foreign direct investment (FDI) inflows in the destination country, whereas there is a negative relationship between corruption and FDI inflows in the source country. Moreover, the publication of the Panama Papers led to a decline in foreign direct investment (FDI) inflows (Zander, 2021).

2.2.2 Political Stability and Foreign Direct Investment

When looking at FDI patterns, political stability is one of the most important factors to consider. Confidence, policy consistency, long-term investment, and economic development are all benefits that foreign investors get when a nation is politically stable (Afzali, 2018).

A research paper titled “Political Stability and Foreign Direct Investment” by Haksoon Kim investigates the relationship between political stability and FDI. The paper examines the country-level FDI flows, FDI inward performance, and political stability measures. This paper studies the relationship between political stability and foreign direct investment (FDI) on economic growth. The study is conducted on three panels: the first panel contains 11 very small economies, the second contains five well-developed and politically stable economies with highly positive FDI net inflows, while the third is a panel with economies that are prone to political violence or targeted by terrorist attacks. The study concludes that there is a long-term relationship between political stability and FDI for the panel of small economies, while no empirical evidence of such a relationship was found for both panels of larger and more developed economies. The study also finds that FDI outflows tend to go towards politically less stable countries (Afzali, 2018).

Other research examines the correlation between political stability and foreign direct investment (FDI) in 25 Asian nations. The text highlights the crucial impact of Foreign Direct Investment (FDI) on economic growth, the transfer of technology, and the generation of employment opportunities. The empirical research demonstrates a direct relation between political stability and

FDI inflows: nations with greater political stability tend to attract a larger amount of FDI (Le et al., 2023).

2.2.3 Regulatory Quality and Foreign Direct Investment

The study titled "Impact of Institutional and Regulatory Quality on FDI Inflow: the case of a Developing Indian Economy" by Leena Ajit Kaushal aims to analyze the influence of regulatory quality (RQ) on foreign direct investment (FDI) inflows in India from 2006 to 2019. The key findings indicate a positive impact of RQ on FDI, particularly evident in reforms facilitating easier business startups and measures easing trade across borders, albeit with varying significance (Mucha & Fetai, 2023). Additionally, the study highlights the positive but insignificant impact of measures related to resolving insolvency on FDI. Conversely, deteriorating labor freedom is found to have a negative impact on FDI. Weak institutional structures sometimes render the impact of RQ insignificant (Mucha & Fetai, 2023).

2.2.4 Rule of Law and Foreign Direct Investment

The article titled "The Rule of Law and Foreign Direct Investment" examines the influence of the Rule of Law on the amount of foreign direct investment (FDI) that enters a country. The Rule of Law pertains to the equitable, transparent, and efficient nature of a nation's legal framework. The study, utilising worldwide panel data, demonstrates that the Rule of Law has beneficial impacts on inward Foreign Direct Investment (FDI). Key elements within the Rule of Law framework, such as the lack of corruption, efficient enforcement of regulations, and transparent governance, are essential in attracting Foreign Direct Investment (FDI). According to McCloud et al. (2023), governments that prioritise the Rule of Law tend to provide a favourable climate for international investment.

2.2.5 GDP growth and Foreign Direct Investment

The research conducted by Al-Kasasbeh et al. (2022) examined the foreign direct investment (FDI) inflows in emerging economies such as India, China, Russia, South Africa, and Brazil. The study covered the period from 1990 to 2020. The key findings suggest a direct relationship between the rise of Gross Domestic Product (GDP) and the inflow of Foreign Direct Investment (FDI) in these economies. Furthermore, FDI inflows are influenced by both vertical factors, which are related to industry-specific characteristics, and horizontal factors, which are driven by market-seeking behaviour. Nevertheless, there are distinct effects that vary by country: Russia and India are impacted by both vertical and horizontal causes, China's foreign direct investment (FDI) inflows are mostly motivated by horizontal reasons, and there seems to be no substantial correlation between FDI inflows into Brazil and South Africa (Al-Kasasbeh et al., 2022).

2.2.6 Inflation and Foreign Direct Investment

Empirical studies on the relationship between inflation and FDI yield mixed and often contradictory results. While some research indicates a negative correlation between inflation and FDI inflows, with higher inflation rates associated with lower FDI levels, other studies suggest a more nuanced relationship. For instance, in certain emerging markets, moderate inflation has been found to coincide with higher FDI inflows, reflecting the positive impact of inflation on domestic

consumption, investment, and export competitiveness (Caon & Caon, 2022). As moderate levels of inflation can potentially be attractive and even beneficial for foreign investors, inflation will only pose a risk of reducing FDI when high levels are sustained over a long period of time (Takefman, 2023).

3. Chapter Three: Data and Methodology

3.1 introduction

Since panel data analysis provides more precise results and more comprehensive information, it will be used in this study rather than time series analysis. The best choice since it deftly captures and investigates the intricate details of scholarly investigation and the ever-changing modifications in interpersonal relationships. Concerning correlations, panel data differs from typical cross-sectional data. Low multicollinearity among independent variables and a large degree of freedom make panel data a popular choice. This study also has a larger sample size since panel data was used.

$$FDI = f(COC, PS, RQ, ROL, GF, VA, GDP, I)$$

The Foreign direct investment is our dependent variable. COC is an abbreviation for Control of Corruption Indicator, PS is Political Stability, RQ is for Regulatory Quality, ROL stands for Rule of Law, GF is a synonym for Government Effectiveness, VA is for Voice and Accountability Index, GDP stands for GDP growth and I for Inflation annual rate

Because panel data analysis outperforms other analytical methods like time series and cross-sectional analysis, it will be used in this research project. When compared to other analytic methods, panel data shows far more variability. But because we don't have enough data to do time series analysis, it works better for our study. Panel data analysis also makes it possible to spot complex interplay between the two sets of variables.

3.2 Data Description

The research study aims to provide sufficient data for a panel test by examining and evaluating the correlation between eight independent factors and a single dependent variable across five distinct nations from 1996 to 2022 in Brazil, China, India, the Russian Federation, and South Africa. The Foreign direct investment is the dependent variable, whereas the independent variables are Control of Corruption, Political Stability and Absence of Violence, Regulatory Quality, Rule of Law, Government Effectiveness, Voice and Accountability, GDP growth,and Inflation. In the end, all of the data used is calculated on an annual basis.

The dependent and independent variables were primarily sourced from the World Bank. The missing data in some of the variables were filled using the interpolation method.

3.3 The Proposed General Form of the Model

$$\text{FDI} = \alpha + \beta^1 CCI + \beta^2 PS + \beta^3 RQ + \beta^4 ROL + \beta^5 GF + \beta^6 VA + \beta^7 GDP + \beta_8 I + \varepsilon$$

Table 1: Description of variables

Independent Variables	Description	Source
Foreign direct investment	The FDI index is a tool used to assess and compare the investment climate of different countries for foreign investors. The index helps identify opportunities and challenges in various markets, providing valuable insights for investors, policymakers, and researchers. It serves as a guide for both foreign investors seeking promising destinations and countries looking to enhance their appeal to attract FDI.	**(World Bank)**
Control of Corruption Indicator	The Control of Corruption Indicator is a crucial tool used by international organizations like the World Bank to assess the level of corruption within a country. It evaluates various aspects related to corruption, such as the strength of anti-corruption institutions, the effectiveness of legal frameworks, transparency in public sector activities, the prevalence of bribery, and the overall integrity of public officials. The data used to construct the indicator is gathered through surveys, expert assessments, and other quantitative and qualitative methods. The Worldwide Governance Indicators (WGI) project by the World Bank develops and maintains these indicators, which aggregate information from multiple sources to provide a comprehensive assessment of a country's control of corruption. The data generated by these indicators can inform policymakers, guide investors in assessing risks, and contribute to research on the relationship between corruption and economic and social outcomes.	**(World Bank)**
Political Stability	Political stability refers to the durability and continuity of a political system, characterized by a lack of disruptions or frequent changes in government. It entails the ability of a government to maintain order, uphold the rule of law, and provide a secure environment. Political stability is vital for attracting foreign investment, as investors seek predictable and secure conditions to minimize risks. Indicators of political stability include peaceful power transitions, a strong judiciary, transparent governance, and the absence of widespread political violence. It is a key element of good governance, fostering economic development and creating a favorable climate for both domestic and foreign businesses. Conversely, political instability can lead to economic uncertainty, hindering development efforts and deterring foreign investment.	**(World Bank)**
Regulatory Quality	Regulatory quality refers to the effectiveness and consistency of a country's regulatory frameworks and institutions. It involves clear, stable, and transparent regulations that facilitate economic growth. High regulatory quality is marked by efficient administrative processes, impartial enforcement, and minimal bureaucratic hurdles. Assessments consider factors like ease of doing business, permit acquisition, and property rights clarity. Countries with high regulatory quality attract investment, encourage entrepreneurship, and foster economic development. Conversely, poor regulatory quality can impede business operations and hinder economic progress. Improving regulatory	**(World Bank)**

	quality is a common goal for countries aiming to enhance their business climates.	
Rule of Law	The rule of law is a foundational principle in governance that emphasizes the supremacy of law, equality before the law, and the protection of individual rights. It signifies a system where laws are clear, predictable, and applied uniformly to all citizens, including government officials. The rule of law ensures that legal processes are fair, transparent, and accessible, providing a framework for justice and accountability. Key components include an independent judiciary, legal certainty, protection of property rights, and adherence to human rights. Upholding the rule of law fosters stability, encourages economic development, and safeguards citizens from arbitrary actions. It is a cornerstone of democratic societies, promoting accountability, justice, and the protection of fundamental freedoms.	**(World Bank)**
Government Effectiveness	Government effectiveness refers to the capacity and efficiency of a government in formulating and implementing policies to meet the needs of its citizens and address public issues. It encompasses the government's ability to translate political will into action, deliver public services, and manage resources effectively. A government is considered effective when it can enforce laws, maintain order, and provide essential services such as education, healthcare, and infrastructure. Indicators of government effectiveness include the quality of public administration, the competence of civil servants, and the efficiency of public service delivery. High government effectiveness is associated with good governance, economic development, and the overall well-being of a society. On the contrary, poor government effectiveness can lead to inefficiency, corruption, and a lack of responsiveness to citizens' needs, hindering societal progress. Evaluating government effectiveness is vital for understanding the quality of governance and informing policies aimed at improving public administration and service delivery.	**(World Bank)**
Voice and Accountability	is a concept often used in governance and development contexts to assess the extent to which citizens can express their opinions, participate in decision-making processes, and hold their government accountable. It reflects the openness of a political system to public input and the degree to which citizens can influence policies and decisions.	**(World Bank)**
GDP growth	The GDP growth (annual %) index is a key economic indicator that measures the percentage change in a country's Gross Domestic Product (GDP) over a year. It is calculated by comparing the GDP of the current year with that of the previous year, expressing the difference as a percentage. Positive growth rates indicate economic expansion, while negative rates signal contraction.	**(World Bank)**
Inflation	The Inflation, GDP deflator (annual %) index is a key economic indicator that measures the percentage change in the Gross Domestic Product (GDP) deflator over a year. The GDP deflator reflects the average price change of all goods and services produced in an economy, providing a comprehensive gauge of inflationary or deflationary pressures. Calculated by comparing the GDP deflator of the current year with that of the previous year, the resulting percentage change signifies the overall price level variation. Positive values indicate inflation, while negative values suggest deflation.	**(World Bank)**

3.4 Econometric Method Panel Data Analysis

Mean: The mean, sometimes referred to as the average, is a statistical concept that indicates the central tendency of a set of numerical data. The procedure entails summing all the values in the dataset and then dividing the total by the number of observations (EViews, 2023).

The median is a statistical measure of central tendency that indicates the middle value in a dataset when it is arranged in either ascending or descending order. When there is an even number of observations, the median is determined by taking the average of the two middle values (EViews, 2023).

Mode: The mode is the value that appears most often in a dataset. A dataset may demonstrate three potential scenarios: unimodal, characterized by a solitary mode; multimodal, characterized by many modes; or amodal, characterized by the absence of any mode, with all values occurring with equal frequency (EViews Guide, 2020).

Range: The range is a statistical measure that measures the degree of variability or dispersion within a dataset. The range of a dataset is calculated by subtracting the smallest value from the greatest value, providing a measure of the magnitude of the differences between the values (EViews Guide, 2020).

Variance refers to a statistical measure that measures the degree to which data points are distributed or scattered. The procedure entails determining the mean of the dataset and then computing the average of the squared differences between each data point and the mean. A larger variance indicates more dispersion across the data (EViews Guide, 2020).

Standard Deviation: The standard deviation is a statistical metric that precisely measures the extent to which data points are spread apart within a dataset. The square root of the variance is a statistical metric that precisely calculates the average variation between each data point and the mean. A larger standard deviation signifies more dispersion throughout the sample, akin to variance (EViews Guide, 2020).

Test for Unit Root: The Unit Root Test is a statistical method used to ascertain if a time series variable has a unit root, hence showing that the variable lacks stationarity. Non-stationarity is a state in which the mean and variance of a variable undergo changes throughout time. The Unit Root Test is a useful tool for evaluating the degree to which patterns endure in the data (EViews Guide, 2020).

Robust Least Squares is a regression technique that is especially designed to minimize the impact of outliers on the estimation of regression coefficients. Robust regression, as opposed to traditional least squares, provides unique weights to data, hence reducing the disproportionate influence of extreme values and enhancing the model's resilience against outliers (EViews Guide, 2020).

The Hausman Test is a statistical test used in econometrics to assess the appropriateness of choosing between fixed effects and random effects models when analyzing panel data. The test

evaluates if the differences in coefficients between the two models are systematic or random, aiding the researcher in selecting the most suitable model for their investigation (EViews Guide, 2020).

Heteroscedasticity refers to the deviation from the assumption of constant variance in a regression model. In the context of linear regression, this implies that the variability of errors is not uniform across all levels of the independent variable. Detecting and addressing heteroscedasticity is crucial for generating precise and effective estimates (EViews Guide, 2020).

In the context of hypothesis testing, the null hypothesis (H0) asserts that there is no effect or difference, whereas the alternative hypothesis (H1) posits the presence of a significant effect or difference. Researchers conduct statistical tests to either reject the null hypothesis in support of the alternative hypothesis or fail to reject the null hypothesis, based on observed data and established levels of significance (EViews Guide, 2020).

A normality test is a statistical procedure used to ascertain if a certain dataset conforms to a normal distribution. The Kolmogorov-Smirnov test and the Shapiro-Wilk test are often used tests. Departure from normality might impact the precision of particular statistical studies, requiring the use of appropriate transformations or non-parametric alternatives (EViews Guide, 2020).

Cross Section Dependence refers to the lack of independence among observations in different cross-sectional units within the framework of panel data analysis. This dependence violates the underlying assumption of autonomy that is often assumed in regression models. To provide reliable and unbiased conclusions in panel data econometrics, it is essential to account for cross-sectional dependency (EViews Guide, 2020).

4. Chapter Four: Descriptive Analysis

4.1 Introduction

Following up on the discussion of panel data analysis and its testing in the preceding chapter, this research chapter delves into an interpretation of the results. One way to find out how corruption and other independent variables affect foreign direct investment (FDI) flows is to use panel data analysis. Subsequent sections go into further depth on these topics.

4.2 Descriptive Statistics

Looking at the descriptive statistics of the variables provide a clear understanding about the data performance. The first table displays the overall statistics of the variables we are considering, including their means, maximums, minimums, and standard deviations.

Table 1: descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
FDI	105	2.289	1.416	-1.787	9.703
COC	105	32.415	15.257	2.871	60.976
PS	105	18.359	8.906	3.883	42.328
RQ	105	35.537	12.316	4.717	65.946
ROL	105	34.116	13.481	6.132	53.365
GF	105	40.714	12.33	11.321	67.619
GDPgrowth	105	4.502	3.997	-7.8	14.231
Inflation	105	6.968	4.55	-.21	24.46

Source: Conducted by the researcher

Looking at the descriptive statistics of the variables provide a clear understanding about the data performance. The first table displays the overall statistics of the variables we are considering, including their means, maximums, minimums, and standard deviations. Descriptive statistics provide a thorough summary of many institutional, political, and economic aspects. With a mean value of 2.289 and a standard deviation of 1.416, foreign direct investment (FDI) represents modest levels of investment inflows. This indicates some variability among data. With a mean of 32.415 and a standard deviation of 15.257, the Control of Corruption Indicator (COC) indicates moderate levels of corruption control while revealing substantial variance across organisations. With a mean of 18.359 and a high standard deviation of 8.906, Political Stability (PS), Rule of Law (ROL), and Government Effectiveness (GF) all show moderate levels, but with significant variability. Voice and Accountability (VA) similarly presents a mixed picture, table 1.

The difference between the maximum and minimum values of the Foreign direct investment (% of GDP) index it's not as high as the other variables. The percentages among all BRICS countries range between a maximum of 4% and a minimum of 1%. But when we look at the results we can see 9% and -1%, look at Table 1. This change is due to rare political and economic events that occurred in Russia and South Africa, as mentioned previously. In 2022, the Russian invasion of Ukraine led to the exit of many foreign investments to Russia, which led to a decrease in foreign investments to -1% (Pindyuk, 2023). The investment that South Africa obtained from the privatization of government companies was the reason for this high percentage, which reached 9% (Goldman & Potter, 2022).

As for the anti-corruption index, there is a big difference between the maximum and minimum. The main reason is the capture of the state by elites and special interests. The maximum ratio ranges between 60.976 and the smallest ratio is 2.871, see Table 1. This large discrepancy is due to the high rates of corruption in a country like Russia. Russia has faced decades of corruption, and a small percentage of businessmen and those close to power largely control the Russian economy (Lüdtke, 2022).

Political stability is one of the crucial issues in the BRICS countries. When looking at Table 1, we see a very large discrepancy between the highest and lowest value of the political stability index. In a country like India, political stability is a thorny issue due to frequent disputes between Indian Muslims and Hindustani Indians (Verghese, 2018). In Russia, the situation is not much different, as there are many disputes between the Russians and the rule of President Putin, whether he is good or not (F. Joseph Dresen, 2024). The increasing polarisation in Brazil poses a significant threat not only to the country's democratic system but also to its ability to effectively tackle its most pressing policy issues (Stuenkel, 2021).

There is a significant disparity in the GDP growth rates among all BRICS countries. This disparity may arise from significant variations in the economic prowess of certain nations compared to others (Chen, 2023). China, the world's second-largest economy (Pettis, 2023), may not be on level with other growing economies like Brazil and South Africa, which are part of the BRICS countries. However, referring to Table 1, it can be observed that Russia had the smallest proportion. Specifically, Russia's actual Gross Domestic Product (GDP) underwent a substantial loss of 7.9 percent in 2009, mostly as a result of three primary factors: the huge drop in oil prices, capital flows, and external finance. The main factors contributing to this decrease were a reduction in domestic liquidity and the simultaneous loss of both industrial output (IP) and aggregate demand (Bogetic, 2010).

4.3 Matrix of correlations

The correlation matrix test serves as a foundational tool in analytical methodologies, enabling a comprehensive understanding of the intricate relationships between variables within a dataset. Beyond merely quantifying the strength and direction of these associations, it aids in variable selection for predictive modeling and regression analyses by highlighting potential multicollinearity issues that could undermine the robustness of models. Moreover, the correlation matrix facilitates exploratory data analysis, guiding hypothesis generation and uncovering patterns that warrant further investigation. It also plays a pivotal role in assumption checking, ensuring that the prerequisites for statistical analyses are met, and in hypothesis testing, allowing researchers to discern whether observed correlations are statistically significant. In essence, the correlation matrix is essential for driving meaningful insights, informing analytical decisions, and bolstering the validity and credibility of research endeavors.

Table 2: correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) FDI	1.000								
(2) COC	-0.129	1.000							
(3) PS	0.013	0.676***	1.000						
(4) RQ	-0.054	0.742***	0.711***	1.000					
(5) ROL	-0.125	0.780***	0.333***	0.500***	1.000				
(6) GF	-0.225**	0.693***	0.379***	0.405***	0.570	1.000			
(7) VA	-0.118	0.579***	0.278***	0.588***	0.720***	0.067	1.000		
(8) GDPgrowth	0.031	-0.081	-0.166*	-0.183*	-0.045	0.254***	-0.361***	1.000	
(9) Inflation	0.023	-0.335***	-0.120	0.083	-0.345***	-0.462***	0.041	0.030	1.000

Source: Conducted by the researcher

(* - significant at 10% significance level) (** - significant at 5% significance level) (*** - significant at 1% significance level)

The Control of Corruption (COC) indicator exhibits strong positive associations with Political Stability (PS) (0.676***), Regulatory Quality (RQ) (0.742***), Rule of Law (ROL) (0.780***), Government Effectiveness (GF) (0.693***), and Voice and Accountability (VA) (0.579***).

Furthermore, there is a substantial positive correlation between Regulatory Quality (RQ) and both Rule of Law (ROL) (0.500***) and Voice and Accountability (VA) (0.588***). Additionally, Rule of Law (ROL) exhibits a strong correlation with Voice and Accountability (VA) (0.720***).

The findings underscore the interdependence of governance elements and underscore the significance of stable political contexts, efficient regulatory frameworks, robust legal institutions, and citizen engagement in combating corruption and supporting good governance practices.

4.4 Unit Root Tests

The panel unit root test can be conducted using either the LLC or IPS method to ascertain the level of integration for each individual variable. According to Kunst, Nell, and Zimmermann (2011), the IPS test is more appropriate for small sample sizes compared to the LLC. The aforementioned conclusion was derived by the utilisation of Monte Carlo simulations. The sample size in this study work is considered modest, as it consists of only 105 observations, making it more appropriate for the IPS test. Nevertheless, we conducted many tests including LLC, IPS, PP, ADF, and Breitung to account for the diverse outcomes regarding the stationarity of the variables. Furthermore, three distinct situations were examined: the first condition involved incorporating an individual intercept into the test equation, the second condition involved incorporating both an individual intercept and trend into the test equation, and the third condition involved not incorporating anything. The null hypothesis posits that the variable exhibits non-stationarity, namely a unit root, while the alternative hypothesis asserts that the variable is stationary.

Ho: Panel data includes unit root

H1: Panel data does not include unit root

Table 3: unit root test

Variables	LLC		Breitung		IPS	
Foreign direct investment, net inflows						
Time trend	Level	1st difference	Level	1st difference	Level	1st difference
Included	-4.0787***	-1.5631*	-	-0.6431	-3.1298***	-1.0868*
Not included	-2.2429**	-0.0307	-	-2.7795***	-2.0509**	-0.0547
Control of Corruption						
Time trend	Level	1st difference	Level	1st difference	Level	1st difference
Included	-0.9922*	-1.4915**	-	-0.2977*	0.1457*	-0.3969*
Not included	-0.1375*	0.1333*	-	-0.0351*	1.0536*	1.3386*
Political Stability and Absence of Violence/Terrorism						
Time trend	Level	1st difference	Level	1st difference	Level	1st difference
Included	-2.4723***	-0.7795	-	-0.8062 *	-1.4091*	-0.1718
Not included	-1.2204*	-0.3969	-	-1.0048*	-1.1543*	-0.4681
Regulatory Quality						
Time trend	Level	1st difference	Level	1st difference	Level	1st difference
Included	-2.9352***	-0.2431	-	0.3137	-1.7905**	0.2979
Not included	0.9054	2.1426	-	1.2574	1.3182	2.2077
Rule of Law						
Time trend	Level	1st difference	Level	1st difference	Level	1st difference
Included	-0.7693	-0.4335	-	0.3557	0.0006	0.3135
Not included	-0.0092	-0.2434	-	-2.0363***	0.2291	0.1985
Government Effectiveness						
Time trend	Level	1st difference	Level	1st difference	Level	1st difference
Included	-1.6017**	1.1325	-	0.5527	-1.2390*	0.5338
Not included	-0.5934	0.4906	-	0.4309	0.1604	1.1826
Voice and Accountability						
Time trend	Level	1st difference	Level	1st difference	Level	1st difference
Included	-0.9064*	-1.7946**	-	1.8053	1.4827	0.1714
Not included	1.6919	0.5998	-	0.7559	1.7535	0.3074
GDP growth (annual %)						
Time trend	Level	1st difference	Level	1st difference	Level	1st difference
Included	-4.4532***	-0.5627*	-	0.3987	-4.7423***	-2.2419***
Not included	-4.2100***	-0.5073*	-	-5.1695***	-3.9880***	-1.2936*

Inflation						
Time trend	Level	1st difference	Level	1st difference	Level	1st difference
Included	-2.0939***	-1.7227***	-	-0.3160	-2.5216***	-2.9397***
Not included	-2.9858***	-3.3865***	-	-3.7050***	-3.0056***	-3.2051***

Source: Conducted by the researcher
(*significant at 0.10 significance level) (**significant at 0.05 significance level) (***significant at 0.01 significance level)

This paper used the LLC, Breitung, and IPS unit root tests to establish the proper sequence of integration for each variable in order to prevent false positives. However, the results of the tests were completely at odds with one another. According to Kunst, Nell, and Zimmermann (2011), the IPS test outperformed the LLC test in small samples when using Monte Carlo simulations.
The unit root test was conducted for the dependent variable which is Foreign direct investment index and the dependent variables which are Control of Corruption, Political Stability and Absence of Violence/Terrorism, Regulatory Quality,Rule of Law, Government Effectiveness,Voice and Accountability, GDP growth (annual %) and Inflation , see Table 3. Most of the results reveal that at a level were non-stationary which means we fail to reject the null hypothesis. On the other hand, the results at the 1st difference were stationary which means reject the null hypothesis. In addition, the majority of the tests were highly significant at level difference.

4.5 Econometric model

The following section will show the results of different econometric analysis

4.5.1 Panel Least Square

Table 4: Estimated Panel Least Squares

CONSTANT	FE	OLS
COC	-0.0445635*	0.0057952
PS	-0.0398995	0.0047757
RQ	0.0392808*	0.0349035
ROL	0.0283869	0.0432148*
GF	-0.0353347	-0.0786512***
VA	0.0137149	-0.0331155**
GDPGROWTH	-0.0162907	0.0329887
INFLATION	0.0001018	-0.0412843
R-SQUARED	0.0058	0.1436
F-STATISTIC	2.22	2.01
PROB (F-STAT)	0.0326	0.0529

Source: Conducted by the researcher

The fixed effect model shows that the Control of Corruption and Regulatory Quality are the only significant variables. As regards the R-squared value describes that Control of Corruption, Political Stability, Regulatory Quality, Rule of Law, Government Effectiveness, Voice and Accountability, GDP growth and Inflation represent or explain 0.58% of Foreign direct investment. This means other variables weren't taken into consideration to explain the Foreign direct investment index by 99.42%, see table 4. Therefore, in this model, the value of R-squared is not efficient enough. The F-statistics is 2.22 and its probability is 0.0326. Additionally, this model is significant at 5% since its probability is 0.0326.

Moving forward to the OLS model, we can see some differences in the relation between the independent and dependent. It shows a negative relationship between Government Effectiveness, Voice/Accountability and Inflation with FDI. On other and Control of Corruption, Political Stability, Regulatory Quality, Rule of Law and GDP GROWTH has a positive relationship with Foreign direct investment. And with R-squared at 14.5% the OLS model represents less than 85.5% of the FDI, Which may be considered a fair percentage for political factors. The F-statistics is 2.01 and its probability is 0.0529. Additionally, this model is significant at 10% since its probability is 0.0529, see table 4.

Table 5: random effect, Stepwise estimation

CONSTANT	RE
RQ	**-0.038**
ROL	**-0.069**
GF	**0.034**
VA	**0.055**
R-SQUARED	**0.128**
F-STATISTIC	**3.68**
PROB (F-STAT)	**0.008**

Source: Conducted by the researcher

Stepwise estimation is a way to build a regression model by either adding or removing predictor variables step by step based on how they affect the model's performance. the dropped variables are Control of Corruption, Political Stability, GDP GROWTH and Inflation. The random effect did not showd any significant variables, look at table 5. With R-squared at 12.8% and F-statistic 3.68 and its probability is 0.008. Additionally, this model is significant at 1% since its probability is 0.008.

4.5.2 Hausman Test

The Hausman test is utilised to determine the most suitable model to depend on. The fixed effects model is considered the most reliable method since it considers the relationship between the error term and the regressor variable, as evidenced by the alternative hypothesis of the Hausman test (Sheytanova, 2014). The null hypothesis of the Hausman test posits that there is no correlation between the error term and the regression variables. If the null hypothesis is accepted, the random effects model will be more reliable than the fixed effects model, **Hausman (1978)**. In contrast, if the fixed effects model is adopted, the random effects model will have less reliability.

$$H_0: (\propto i,) = 0$$

$$H_1: (\propto i,) \neq 0$$

Table 6: Hausman Test

	COEF.
CHI-SQUARE TEST VALUE	31.641
P-VALUE	0

Source: Conducted by the researcher

The Wu-Hausman test p-value of 0. Since we cannot reject the null hypothesis, the RE coefficients are consistent and efficient.

4.5.3 ARDL model

The autoregressive distributed lag (ARDL) model is a versatile model that can be used for both non-stationary and mixed order integration time series. It is based on ordinary least squares (OLS) and provides valuable insights for financial analysis. To effectively capture the data-generating process in a general-to-specific modelling framework, it is essential to include an adequate number of lags in this model. Regressions utilising standard least squares, or ARDLs, include lags from the dependent and independent variables as regressors. When it comes to econometrics, the ARDL model is particularly noteworthy because it can analyse the dynamics between multiple time series variables, both in the long-term and short-term. It goes beyond the time difference between short-term fluctuations and long-term balancing processes (EViwes Guide, 2020).

Table 7: ARDL Model

	LONG RUN EQUATION	SHORT RUN EQUATION
COC(-2)	**0.197454*** **	**-0.18028**
GDP	**0.100735** **	**-0.0292**
GF	**-0.16913**	**0.15074**
PS	**-0.04656**	**-0.09087**
INFLATION	**0.002356**	**0.001901**
RQ	**-0.03117***	**-0.03638**
ROL	**0.071798***	**0.044873**
VA	**0.132584*** **	**0.02617**

Source: Conducted by the researcher

it is clear that the most significant variables in the long run are (COC) Control of Corruption, (VA) Voice and Accountability. the GDP with a significant level of 5%, see Table 7. Then came Regulatory Quality and the Rule of law significant at 10%. In the short run, there are no significant variables. This implies that factors such as COC and VA. Their efficacy may only manifest in the long run.

4.5.4 ARDL per country

Table 8: ARDL per country

Variables / ***Countries***	***COC***	***GDP***	***D(GF)***	***D(INFLATION)***	***D(PS)***	***D(RQ)***	***D(ROL)***	***D(VA)***
BRA	**0.112669 *** **	**0.114291 *** **	**0.084401 *** **	**0.005169 ** **	**0.01555 *** **	**-0.1590 *** **	**-0.0402 *** **	**0.275881 *** **
China	**-0.029975 *** **	**0.028903 *** **	**0.024436 *** **	**-0.071833 *** **	**-0.08394 *** **	**0.075328 *** **	**-0.000661**	**0.034626 ** **
Russia	**-0.219088 *** **	**0.094419 *** **	**0.111534 *** **	**-0.097229 *** **	**0.122647 *** **	**0.189463 *** **	**-0.0735 *** **	**-0.374638 *** **
SA	**-0.0336*** **	**-0.010763 *** **	**0.221361**	**0.154061 *** **	**-0.12342 *** **	**-0.1865 *** **	**0.254644 *** **	**-0.327206 *** **

India	**-0.023478 *****	**0.032258 *****	**0.016228 *****	**-0.08976 *****	**0.094721 *****	**0.015727 ****	**0.000793**	**-0.108278 *****

Source: Conducted by the researcher

Table 7 focused on interpreting the results of the impact of independent variables on the dependent variable for each country in order to track the effect of each variable on the main variable which is Foreign Direct Investment (FDI).

The Control of Corruption has shown a high significance in all countries at 1%, with a negative relationship with all countries which means with an increase of corruption the FDI inflow will decrease, except in Brazile (BRA) the rustle shows a positive relation, see table 8. In previse studies suggested The phrase "greases the wheels" of government alludes to the notion that corruption, although morally wrong, can occasionally expedite more seamless interactions between corporations and government agencies. Corruption in this context refers to the act of offering bribes or engaging in other illegal practices to speed up bureaucratic procedures or obtain preferential treatment for enterprises (Zander, 2021).

The key findings suggest a direct positive relationship between the rise of Gross Domestic Product (GDP) and the inflow of Foreign Direct Investment (FDI) in these economies For Brazil, China, Russia and India, in the case of South Africa there is a negative relationship between GDP and FDI, Institutional issues like inequality, excessive unemployment, and policy instability can inhibit FDI in South Africa (Al-Kasasbeh et al., 2022). The country's poor transportation, energy, and communication infrastructure further hinders investment. Businesses considering investing in South Africa may face logistical issues, higher operational expenses, and lower competitiveness due to these issues (Al-Kasasbeh et al., 2022).

After taking the deference for (GF) the result shows a high significance positive relationship at 1%, Which means that a variable such as Government effectiveness shows a long-term relationship between political stability and FDI.

political stability is one of the most important factors to consider. Confidence, policy consistency, long-term investment, and economic development are all benefits that foreign investors get when a nation is politically stable (Afzali, 2018), see table 7. Each of BRA, Russia and India has a high significance positive relationship at 1%. Moreover, China and SA also has a high negative significance relationship at 1% with FDI. The results are consistent with the studies conducted by Kurecic and Kokotovic (2017), Shan et al. (2018), and the regulatory risk theory. These sources propose that foreign direct investment (FDI) might be discouraged by a combination of political stability and unfavourable regulatory policies or excessive government interference.

The coefficients derived from the analysis offer valuable insights into the relationship between inflation and Foreign Direct Investment (FDI). In Brazil, a positive coefficient indicates that higher inflation rates coincide with increased FDI inflows, suggesting that foreign investors perceive inflation as less of a deterrent amid favorable market conditions. Conversely, in China and Russia, negative coefficients signify that higher inflation is associated with reduced FDI inflows, reflecting concerns about economic instability and operational challenges (Al-Kasasbeh et al., 2022). However, in South Africa, a positive coefficient suggests that moderate inflation levels may stimulate FDI, likely driven by promising economic prospects and investment opportunities. In

contrast, India's negative coefficient underscores how inflationary pressures deter FDI, reflecting investor apprehension about economic stability and profitability.

The correlation between inflation and FDI produces varied and frequently conflicting outcomes. While several studies suggest that there is a negative association between inflation and FDI inflows, meaning that greater inflation rates are linked to lower levels of FDI, other research indicates a more complex and nuanced relationship between the two factors. For example, in some developing economies, there is a correlation between moderate inflation and increased foreign direct investment (FDI). This suggests that inflation has a beneficial effect on local spending, investment, and the ability to compete in international markets (Caon & Caon, 2022).While moderate levels of inflation may be appealing and advantageous for foreign investors, prolonged high levels of inflation over an extended period of time might represent a danger of lowering foreign direct investment (FDI) (Takefman, 2023).

The coefficients reflecting the relationship between regulatory quality and Foreign Direct Investment (FDI) across different countries provide nuanced insights into the impact of regulatory frameworks on investment attractiveness. In Brazil, the unexpected negative coefficient suggests that despite potential improvements in regulatory quality, other factors such as regulatory uncertainty may overshadow the benefits, leading to reduced FDI inflows (Mucha & Fetai, 2023). Conversely, positive coefficients in China and Russia indicate that favourable regulatory environments, characterized by reforms aimed at streamlining processes and enhancing investor protection, contribute to attracting FDI. However, in South Africa, the negative coefficient suggests that persistent challenges in the regulatory landscape, such as bureaucratic hurdles and legal uncertainties, undermine investment attractiveness despite efforts to improve regulations. In India, while regulatory reforms have a positive albeit modest effect on FDI, the coefficient implies that lingering regulatory complexities continue to pose obstacles to foreign investment (Mucha & Fetai, 2023).

The analysis of coefficients pertaining to voice and accountability unveils the subtle influence of these characteristics on Foreign Direct Investment (FDI) in various countries. In Brazil, the positive coefficient indicates that improved voice and accountability have a positive impact on foreign direct investment (FDI), indicating a favourable investment environment characterised by transparency and good governance. Similarly, in China, the coefficient suggests a small beneficial impact. see table 7, which indicates that advancements in voice and accountability play a significant role in bolstering investor trust and attracting foreign direct investment (FDI). In contrast, the negative coefficient in Russia indicates that obstacles associated with voice and responsibility, such as restricted political liberties or institutional deficiencies, discourage the influx of foreign direct investment (Belgibayeva & Plekhanov, 2019). In South Africa, the presence of a negative coefficient indicates a little negative effect. This signifies that despite attempts to enhance voice and accountability, persistent problems may still hinder foreign investment. In India, the negative coefficient highlights how shortcomings in voice and accountability might impede foreign direct investment (FDI), indicating worries about political stability and regulatory openness (Belgibayeva & Plekhanov, 2019).

The interpretation of coefficients regarding the Rule of Law (ROL) and its impact on Foreign Direct Investment (FDI) across different countries reveals a nuanced picture. In Brazil and Russia,

negative coefficients suggest that while improvements in the rule of law are made, they may not necessarily translate into increased FDI, possibly due to other factors overshadowing legal reforms (Alexander, 2014). Conversely, in South Africa, a positive coefficient implies that a strong rule of law positively influences FDI, indicating that effective legal frameworks enhance investor confidence and attract foreign capital (McCloud et al. ,2023). However, in India and China, where no significant coefficients exist, the relationship between FDI and the rule of law appears less pronounced, suggesting that other factors may dominate investors' decision-making processes. The lack of a consistent relationship between the rule of law and FDI could be attributed to various factors. In some cases, such as India and China, investors may prioritize other factors like market size, economic growth, or government policies over legal considerations. Additionally, despite the presumed benefits of a strong rule of law, there are instances where it negatively affects FDI. Legal uncertainty arising from weak rule of law creates risks for investors, particularly concerning contract enforcement, property rights protection, and dispute resolution, thereby deterring foreign investment (Alexander, 2014).

4.5.5 Variance inflation factor

Table 9: Variance inflation factor

	VIF	1/VIF
COC	7.282	.137
VA	6.21	.161
ROL	6.161	.162
RQ	4.432	.226
GF	4.027	.248
PS	2.755	.363
INFLATION	1.489	.671
GDPGROWTH	1.426	.701
MEAN VIF	4.223	.

Source: Conducted by the researcher

The variance inflation factor (VIF) measures the extent of multicollinearity between independent variables in a regression model, with higher values indicating stronger correlations between predictors (Stata Guide,2023). In this analysis, the VIF values range from 1.426 to 7.282, with an average VIF of 4.223. Generally, VIF values above 10 indicate high multicollinearity, suggesting that the corresponding predictors may be highly correlated with other variables in the model. However, in this case, all VIF values are below 10, indicating moderate levels of multicollinearity. Specifically, Control of Corruption (COC), Voice and Accountability (VA), Rule of Law (ROL), and Rule of Law (RQ) exhibit relatively higher VIF values, suggesting some degree of multicollinearity among these variables. Conversely, Political Stability (PS), Inflation, and GDP Growth demonstrate lower VIF values, indicating lower levels of multicollinearity. It's important to note that while multicollinearity may inflate standard errors and reduce the precision of coefficient estimates, it doesn't necessarily invalidate the regression model.

4.5.6 Heteroskedasticity Test

Statisticians employ many statistical techniques, such as the Breusch-Pagan test, White test, and Goldfeld-Quandt test, to evaluate the presence of heteroskedasticity in regression models. The purpose of these tests is to assess the correlation between residuals and independent variables, provide diagnostic capabilities, and identify any systematic inconsistencies (EViews Guide, 2020).

H_0: Residuals are homoskedastic

H_1: Residuals are heteroskedastic

Table 10: Heteroskedasticity Test

Chi-Sq. Statistic	***probability***
0.02	**0.8906**

Source: Conducted by the researcher

Given the p-value of 0.8906, which exceeds the standard significance level of 0.05, we would fail to reject the null hypothesis. Therefore, the data exhibit homoscedasticity.

4.5.7 Autocorrelation test

H0: no first-order autocorrelation

Table 11: Autocorrelation test

F(1, 4)	***probability***
1.067	**0.3600**

Source: Conducted by the researcher

The Wooldridge test for autocorrelation in panel data was used to test the null hypothesis (H0) that there is no first-order autocorrelation. The calculated test statistic, with an F-statistic value of 1.067, resulted in a p-value of 0.3600. Since the p-value is more than the standard significance level of 0.05, we cannot reject the null hypothesis. Therefore, there is not enough evidence to indicate the presence of substantial first-order autocorrelation in the panel data. To summarise, the test results do not indicate the existence of first-order autocorrelation.

4.5.8 Diagnostic Test (Normality Test)

Normality tests evaluate whether a dataset adheres to a normal distribution by employing techniques such as Shapiro-Wilk, Kolmogorov-Smirnov, and Anderson-Darling. These tests assess the similarity between the cumulative distribution function of the data and a normal distribution. They reject the null hypothesis if the p-values fall under the predetermined significance limits (EViews Guide, 2020).

H_0: Error term is normally distributed

H_1: Error term is not normally distributed

Table 12: Normality Test

	STATISTIC	**PROBABILITY**
JARQUE-BERA	483.6916	0.0000

Source: Conducted by the researcher

Based on the data provided in Table 10, the Jarque-Bera probability exceeds 5%, indicating that the null hypothesis will be rejected. The data exhibits a abnormal distribution due to the differences variations and

fluctuations observed among the variables analysed during the study period.

5. Chapter Five: Discussion, conclusion, and implications

5.1 Introduction:

This chapter will focus on evaluating the results and findings. Furthermore, we will observe the relationship between the relationship between Foreign direct investment and Control of Corruption, Political Stability, foreign direct investment, Regulatory Quality, Rule of Law,Government Effectiveness, Voice and Accountability, GDP growth and Inflation, all varibls as a percentage. Moreover, Limitations that were faced during the formulation of this paper will be highlighted and policy recommendations for future research will be mentioned.

5.2 Discussion of the hypothesis

Table 13: Analysis of the Hypothesis

Hypothesis of the study	Model	Type of relation	Decision
There is a negative relationship between the level of corruption and FDI inflows in the BRICS countries.	ARDL & OLS	negative	Not Supported
Political stability has a positive impact on FDI inflows among the BRICS countries.	ARDL & OLS	positive	partially supported
Regulatory quality has a positive impact on FDI attractiveness in the BRICS region.	ARDL & OLS	positive	partially supported
The rule of law does have a positive significant correlation with FDI patterns within the BRICS nations.	ARDL & OLS	positive	Supported
Government effectiveness has a positive significant impact on FDI trends in the BRICS region.	ARDL & OLS	positive	partially supported
There is a positive relationship between GDP growth and the foreign direct investment landscape in the BRICS countries.	ARDL & OLS	positive	Supported
Inflation rates do have a negative significant impact on FDI levels in the BRICS countries.	ARDL & OLS	negative	partially supported

5.3 Discussion of major findings

5.3.1 Control of Corruption

The rustling demonstrates a positive relation between COC and FDI in both tests. Prior research has indicated The expression "greases the wheels" of government refers to the idea that corruption, albeit being ethically incorrect, can sometimes facilitate smoother relations between corporations and government institutions. Corruption, in this particular context, pertains to the act of providing bribes or participating in other illicit activities in order to expedite bureaucratic processes or gain advantageous treatment for businesses (Zander, 2021). Although corruption is widespread, the BRICS countries, including Brazil, Russia, India, China, and South Africa, have managed to attract substantial foreign direct investments (FDI) due to many factors. Firstly, these countries possess copious natural resources, including minerals, oil, and agricultural products, which attract investors to these economies that are abundant in resources (Anwar & Iwasaki, 2021). For example, Brazil's extensive agricultural area, Russia's abundant oil reserves, and South Africa's substantial mineral richness serve as significant attractions for foreign direct investment (Anwar & Iwasaki, 2021). Furthermore, the BRICS countries together constitute a significant proportion of the global population and GDP. This presents lucrative consumer markets for enterprises, especially in industries such as technology, manufacturing, and services (Lemmon, 2013). Furthermore, these nations have made substantial investments in infrastructure initiatives, including transportation, energy, and telecommunications, that enhance business activities and trade, rendering them appealing to investors who desire long-term advantages from enhanced infrastructure (Economics Observatory, 2024).

5.3.2 Political stability

The contrasting results between the OLS and ARDL models in analyzing the relationship between political stability and foreign direct investments (FDI) highlight important methodological considerations. The OLS test indicates a positive relationship, aligning with previous research that politically stable countries attract higher FDI due to reduced uncertainty and risk (Erb, Harvey & Viskanta, 1996) (Le et al., 2023). However, OLS assumes no endogeneity, no omitted variables, and no serial correlation, potentially missing the dynamic aspects of this relationship. In contrast, the ARDL model, which accounts for both short-term dynamics and long-run relationships, shows a negative relationship in the long run, suggesting that FDI might eventually flow away from politically stable countries. Stable political systems might impose restrictive regulations, bureaucratic hurdles, or unpredictable policy shifts, thereby complicating the operational environment for foreign investors and reducing their profitability (Afzali, 2018).

5.3.3 Regulatory quality

The OLS test indicates a positive relationship between regulatory quality and FDI, aligning with previous research that suggests well-regulated environments attract more FDI inflows (Mucha & Fetai, 2023). In contrast, the ARDL model, which considers both short-term dynamics and long-run relationships, might show a negative relationship between regulatory quality and FDI, implying that in the long run, FDI tends to flow away from countries with better regulatory quality. Weak institutional structures sometimes

render the impact of RQ insignificant (Mucha & Fetai, 2023).

5.3.4 rule of law

According to our model, rule of law has a positive effect on FDI. The scientific reasons behind the importance of rule of law are aligned with the results of our model. According to McCloud et al. (2023), governments that prioritise the Rule of Law tend to provide a favourable climate for international investment.

5.3.5 Government effectiveness

The divergent outcomes of the ARDL test and the OLS test with respect to the correlation between government effectiveness and foreign direct investments (FDI) in BRICS nations underscore distinct viewpoints. The ARDL model demonstrates a direct positive relationship between government effectiveness and foreign direct investment (FDI), indicating that as governance improves, FDI is likely to increase over time. Possible factors contributing to this phenomenon include heightened investor confidence resulting from political stability and business-friendly policies, as well as streamlined public administration that minimises bureaucratic hurdles, hence attracting foreign direct investment (FDI) (Mucha & Fetai, 2023). Conversely, the OLS test demonstrates a negative relation between government effectiveness. Consequently, the impact of government quality may only manifest itself over an extended period of time.

5.3.6 GDP growth

The effect of GDP growth on foreign direct investment was seen as positive by the OLS and ARDL on the Long Run Equation. This means that an increase in GDP growth leads to an increase in the FDI. This is supported by the research conducted by Al-Kasasbeh et al. (2022) examined the foreign direct investment (FDI) inflows.

5.3.7 Inflation

The contrasting results between the OLS test and the ARDL test regarding the relationship between inflation and foreign direct investments (FDI) in BRICS countries can be intriguing. The OLS test indicates a negative relationship between inflation and FDI, aligning with some previous research that suggests higher inflation rates may deter FDI inflows by creating uncertainty, reducing investor confidence, and eroding purchasing power. In contrast, the ARDL model, which considers both short-term dynamics and long-run relationships, might show a positive relationship between inflation and FDI, implying that over time, FDI tends to increase with inflation in BRICS countries. This could be due to inflation signaling accommodative monetary policy, attracting FDI, or moderate inflation leading to currency depreciation, making exports more competitive and boosting FDI (Caon & Caon, 2022).

Several studies suggest that there is a negative association between inflation and FDI inflows, meaning that greater inflation rates are related with lower levels of FDI. However, other research indicates that the relationship between inflation and FDI is more complex and cannot be generalised. For example, in specific developing economies, there is evidence that moderate inflation is associated with increased foreign direct investment (FDI) inflows. This suggests that inflation has a beneficial effect on domestic consumption, investment, and export competitiveness (Caon & Caon, 2022). According to Takefman (2023), moderate levels of inflation can be appealing and advantageous for foreign investors. However, prolonged high levels of inflation over a long period of time can constitute a risk by limiting foreign direct investment (FDI).

5.4 Conclusion

This study aimed to elucidate the complex relationship between corruption and foreign direct investment (FDI) in BRICS countries, focusing on the period from 2002 to 2022. The research utilized both ARDL and OLS models to analyze this relationship, revealing several key insights.

Firstly, the hypothesis that corruption negatively impacts FDI inflows was not uniformly supported across the BRICS nations. While the general assumption in economic theory posits that corruption deters foreign investment, the findings indicated a nuanced reality. In Russia, India, China, and South Africa, there was an inverse relationship between corruption and FDI, aligning with traditional views. However, Brazil presented an anomaly where a positive relationship between corruption and FDI was observed. This could be attributed to the notion that in certain contexts, corruption might "grease the wheels" of bureaucracy, thereby facilitating business operations despite ethical concerns.

The study also highlighted the importance of other institutional factors in influencing FDI. Political stability, regulatory quality, rule of law, and government effectiveness were generally found to have positive impacts on FDI inflows, although the strength and significance of these relationships varied among the BRICS countries. For instance, regulatory quality showed a positive correlation with FDI in China and Russia, suggesting that reforms aimed at streamlining processes and enhancing investor protection are crucial in attracting foreign investments. Conversely, in Brazil and South Africa, regulatory challenges and uncertainties continued to pose significant barriers.

Economic factors such as GDP growth and inflation were also significant. Consistent with expectations, GDP growth had a positive relationship with FDI, underscoring the attractiveness of rapidly growing economies to foreign investors. On the other hand, high inflation rates were found to negatively impact FDI, reflecting the economic instability and uncertainty that deter investors.

In summary, while corruption generally hinders FDI inflows, this relationship is not uniform across all BRICS countries. Other institutional and economic factors play critical roles in shaping the FDI landscape. Policymakers should therefore adopt a multifaceted approach, focusing not only on reducing corruption but also on enhancing political stability, regulatory quality, rule of law, and economic stability to create a conducive environment for foreign investments. Future research should continue to explore these dynamics, considering the evolving political and economic contexts of these countries.

5.5 Policy recommendations

The study's overall policy recommendation is that emerging economies such as BRICS should adopt more comprehensive reforms to enhance their ability to attract foreign direct investment (FDI). Key policies include:

1. Implement uniform and efficient certification procedures to guarantee high standards and adherence to regulations, hence fostering trust among investors.

2. Allocate resources to develop digital infrastructure that enables remote work and enhances connectivity to global markets, hence increasing the appeal of the economy to technology-driven and international enterprises.

3. Establish Export Processing Zones (EPZs) to provide incentives and simplified rules for exporters, creating a favourable environment for foreign investments and enhancing growth focused on exports.

Similar to other empirical investigations in this domain, the present study possesses its unique array of constraints. The conclusions should not be definitively applied as they strongly depend on the existing dataset. Further research is required to extrapolate the findings (Al-Kasasbeh et al.,2022).

Implementing policies to reduce structural problems and investing in infrastructure could boost foreign investor interest, economic growth, and job creation (Al-Kasasbeh et al.,2022).

5.6 limitations

One of the main limitations of this paper was the unavailability of valid data on corruption rates in BRICS countries. Some data may also be misleading for reasons that may be related to political corruption

5.7 recommendation for future research

The subject of corruption and foreign direct investment (FDI) inflow is intriguing, and future research may opt to explore not just the extent of corruption but also its kind. The reason for this variation is that corruption can manifest in various forms, and different countries may encounter distinct patterns of corrupt behavior. This analysis may provide a deeper understanding of the correlation between corruption and economic growth in developing and transitional nations.

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7. Appendix

Variable	Obs	Mean	Std. dev.	Min	Max
FDI	105	2.289141	1.416129	-1.787319	9.703406
COC	105	32.41542	15.25699	2.870813	60.97561
PS	105	18.3585	8.906202	3.883495	42.32804
RQ	105	35.53672	12.3159	4.716981	65.94595
ROL	105	34.11637	13.48067	6.132075	53.36538
GF	105	40.71352	12.33046	11.32076	67.61905
VA	105	37.39521	23.61792	1.449275	63.28502
GDPgrowth	105	4.502285	3.996849	-7.799994	14.23086
Inflation	105	6.968055	4.550281	-.2095334	24.46009

	FDI	COC	PS	RQ	ROL	GF	VA
FDI	1.0000						
COC	-0.1288	1.0000					
PS	0.0125	0.6761	1.0000				
RQ	-0.0536	0.7417	0.7110	1.0000			
ROL	-0.1251	0.7799	0.3331	0.4995	1.0000		
GF	-0.2248	0.6929	0.3788	0.4052	0.5703	1.0000	
VA	-0.1180	0.5791	0.2781	0.5882	0.7203	0.0674	1.0000
GDPgrowth	0.0308	-0.0810	-0.1663	-0.1828	-0.0450	0.2538	-0.3613
Inflation	0.0229	-0.3349	-0.1199	0.0828	-0.3452	-0.4620	0.0405

	GDPgro~h	Inflat~n
GDPgrowth	1.0000	
Inflation	0.0304	1.0000

Source	SS	df	MS		
Model	29.9506797	8	3.74383497	Number of obs	= 105
Residual	178.613148	96	1.86055362	F(8, 96)	= 2.01
				Prob > F	= 0.0529
Total	208.563827	104	2.00542142	R-squared	= 0.1436
				Adj R-squared	= 0.0722
				Root MSE	= 1.364

FDI	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
COC	.0057952	.025335	0.23	0.820	-.0444944	.0560848
PS	.0047757	.0261767	0.18	0.856	-.0471847	.0567361
RQ	.0349035	.0232963	1.50	0.137	-.0113393	.0811463
ROL	.0432148	.025291	1.71	0.091	-.0069875	.0934171
GF	-.0786512	.0231547	-3.40	0.001	-.124613	-.0326894
VA	-.0331155	.0145861	-2.27	0.025	-.0620686	-.0041624
GDPgrowth	.0329887	.0408547	0.81	0.421	-.0481074	.1140847
Inflation	-.0412843	.040387	-1.02	0.309	-.1214519	.0388832
_cons	3.878598	.7450438	5.21	0.000	2.399697	5.357498

```
Fixed-effects (within) regression               Number of obs      =       105
Group variable: nation                          Number of groups   =         5

R-squared:                                      Obs per group:
     Within  = 0.1620                                         min =        21
     Between = 0.1624                                         avg =      21.0
     Overall = 0.0058                                         max =        21

                                                F(8,92)            =      2.22
corr(u_i, Xb) = -0.7009                         Prob > F           =    0.0326
```

FDI	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
COC	-.0445635	.0258911	-1.72	0.089	-.0959855	.0068585
PS	-.0398995	.0313724	-1.27	0.207	-.1022078	.0224089
RQ	.0392808	.0229131	1.71	0.090	-.0062266	.0847882
ROL	.0283869	.0272878	1.04	0.301	-.0258091	.0825829
GF	-.0353347	.0260238	-1.36	0.178	-.0870203	.0163509
VA	.0137149	.0411487	0.33	0.740	-.06801	.0954398
GDPgrowth	-.0162907	.0481128	-0.34	0.736	-.1118469	.0792656
Inflation	.0001018	.040099	0.00	0.998	-.0795382	.0797419
_cons	3.100172	1.610739	1.92	0.057	-.0988948	6.299239
sigma_u	1.2228708					
sigma_e	1.248676					
rho	.48956021	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(4, 92) = 5.64                     Prob > F = 0.0004
```

```
Random-effects GLS regression                   Number of obs      =       105
Group variable: nation                          Number of groups   =         5

R-squared:                                      Obs per group:
     Within  = 0.0571                                         min =        21
     Between = 0.7146                                         avg =      21.0
     Overall = 0.1436                                         max =        21

                                                Wald chi2(8)       =     16.10
corr(u_i, X) = 0 (assumed)                      Prob > chi2        =    0.0410
```

FDI	Coefficient	Std. err.	z	P>|z|	[95% conf.	interval]
COC	.0057952	.025335	0.23	0.819	-.0438605	.0554509
PS	.0047757	.0261767	0.18	0.855	-.0465298	.0560811
RQ	.0349035	.0232963	1.50	0.134	-.0107564	.0805634
ROL	.0432148	.025291	1.71	0.088	-.0063547	.0927844
GF	-.0786512	.0231547	-3.40	0.001	-.1240336	-.0332687
VA	-.0331155	.0145861	-2.27	0.023	-.0617036	-.0045273
GDPgrowth	.0329887	.0408547	0.81	0.419	-.0470852	.1130625
Inflation	-.0412843	.040387	-1.02	0.307	-.1204414	.0378727
_cons	3.878598	.7450438	5.21	0.000	2.418339	5.338856
sigma_u	0					
sigma_e	1.248676					
rho	0	(fraction of variance due to u_i)				

```
.  stepwise, pr(0.2) : regress FDI COC PS RQ ROL GF VA GDPgrowth Inflation

Wald test, begin with full model:
p = 0.8556 >= 0.2000, removing PS
p = 0.7231 >= 0.2000, removing COC
p = 0.4347 >= 0.2000, removing GDPgrowth
p = 0.3243 >= 0.2000, removing Inflation
```

Source	SS	df	MS	Number of obs	=	105
				F(4, 100)	=	3.68
Model	26.7488544	4	6.68721361	Prob > F	=	0.0078
Residual	181.814973	100	1.81814973	R-squared	=	0.1283
				Adj R-squared	=	0.0934
Total	208.563827	104	2.00542142	Root MSE	=	1.3484

FDI	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
VA	-.0377694	.0128015	-2.95	0.004	-.0631672	-.0123716
GF	-.0690962	.0194321	-3.56	0.001	-.107649	-.0305435
RQ	.0344864	.0159131	2.17	0.033	.0029152	.0660575
ROL	.0548297	.0230021	2.38	0.019	.0091943	.1004651
_cons	3.418563	.5119778	6.68	0.000	2.402814	4.434312

hausman FE RE

```
. hausman FE RE
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	(b) FE	(B) RE	(b-B) Difference	sqrt(diag(V_b-V_B)) Std. err.
COC	-.0445635	.0057952	-.0503587	.0053372
PS	-.0398995	.0047757	-.0446752	.0172918
RQ	.0392808	.0349035	.0043773	.
ROL	.0283869	.0432148	-.0148279	.0102464
GF	-.0353347	-.0786512	.0433165	.0118785
VA	.0137149	-.0331155	.0468304	.0384768
GDPgrowth	-.0162907	.0329887	-.0492793	.0254113
Inflation	.0001018	-.0412843	.0413862	.

b = Consistent under H0 and Ha; obtained from **xtreg**.
B = Inconsistent under Ha, efficient under H0; obtained from **xtreg**.

```
Test of H0: Difference in coefficients not systematic

    chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
            =  31.64
Prob > chi2 = 0.0001
(V_b-V_B is not positive definite)
```

Unit root test

Levin–Lin–Chu unit-root test for FDI

H0: Panels contain unit roots Number of panels = 5
Ha: Panels are stationary Number of periods = 21

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Included

ADF regressions: 0 lags
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-7.8740	
Adjusted t*	-4.0787	0.0000

Levin–Lin–Chu unit-root test for FDI

H0: Panels contain unit roots Number of panels = 5
Ha: Panels are stationary Number of periods = 21

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-6.4629	
Adjusted t*	-1.5631	0.0590

Levin–Lin–Chu unit-root test for COC

H0: Panels contain unit roots Number of panels = 5
Ha: Panels are stationary Number of periods = 21

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Included

ADF regressions: 0 lags
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value

```
 Unadjusted t        -4.7687
 Adjusted t*         -0.9922        0.1606
--------------------------------------------------------------------------------

Levin–Lin–Chu unit-root test for COC
-----------------------------------
H0: Panels contain unit roots              Number of panels  =      5
Ha: Panels are stationary                  Number of periods =     21

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
--------------------------------------------------------------------------------
                 Statistic      p-value
--------------------------------------------------------------------------------
 Unadjusted t        -5.4354
 Adjusted t*         -1.4915        0.0679
--------------------------------------------------------------------------------

Levin–Lin–Chu unit-root test for PS
-----------------------------------
H0: Panels contain unit roots              Number of panels  =      5
Ha: Panels are stationary                  Number of periods =     21

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 0 lags
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
--------------------------------------------------------------------------------
                 Statistic      p-value
--------------------------------------------------------------------------------
 Unadjusted t        -6.1779
 Adjusted t*         -2.4723        0.0067
--------------------------------------------------------------------------------


Levin–Lin–Chu unit-root test for PS
-----------------------------------
H0: Panels contain unit roots              Number of panels  =      5
Ha: Panels are stationary                  Number of periods =     21

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
```

	Statistic	p-value
Unadjusted t	-5.4490	
Adjusted t*	-0.7795	0.2178

Levin–Lin–Chu unit-root test for RQ

H0: Panels contain unit roots — Number of panels = 5
Ha: Panels are stationary — Number of periods = 21

AR parameter: Common — Asymptotics: N/T -> 0
Panel means: Included
Time trend: Included

ADF regressions: 0 lags
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-6.3519	
Adjusted t*	-2.9352	0.0017

Levin–Lin–Chu unit-root test for RQ

H0: Panels contain unit roots — Number of panels = 5
Ha: Panels are stationary — Number of periods = 21

AR parameter: Common — Asymptotics: N/T -> 0
Panel means: Included
Time trend: Included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-4.4364	
Adjusted t*	-0.2431	0.4039

Levin–Lin–Chu unit-root test for ROL

H0: Panels contain unit roots — Number of panels = 5
Ha: Panels are stationary — Number of periods = 21

AR parameter: Common — Asymptotics: N/T -> 0
Panel means: Included
Time trend: Included

ADF regressions: 0 lags
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-4.6630	
Adjusted t*	-0.7693	0.2209

Levin–Lin–Chu unit-root test for ROL

H0: Panels contain unit roots — Number of panels = 5
Ha: Panels are stationary — Number of periods = 21

AR parameter: Common — Asymptotics: N/T -> 0
Panel means: Included
Time trend: Included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-4.4913	
Adjusted t*	-0.4335	0.3323

Levin–Lin–Chu unit-root test for GF

H0: Panels contain unit roots — Number of panels = 5
Ha: Panels are stationary — Number of periods = 21

AR parameter: Common — Asymptotics: N/T -> 0
Panel means: Included
Time trend: Included

ADF regressions: 0 lags
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-6.3879	
Adjusted t*	-1.6017	0.0546

Levin–Lin–Chu unit-root test for GF

H0: Panels contain unit roots — Number of panels = 5
Ha: Panels are stationary — Number of periods = 21

AR parameter: Common — Asymptotics: N/T -> 0

Panel means: Included
Time trend: Included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-4.6741	
Adjusted t*	1.1325	0.8713

Levin–Lin–Chu unit-root test for VA

H0: Panels contain unit roots — Number of panels = 5
Ha: Panels are stationary — Number of periods = 21

AR parameter: Common — Asymptotics: N/T -> 0
Panel means: Included
Time trend: Included

ADF regressions: 0 lags
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-3.2121	
Adjusted t*	-0.9064	0.1824

Levin–Lin–Chu unit-root test for VA

H0: Panels contain unit roots — Number of panels = 5
Ha: Panels are stationary — Number of periods = 21

AR parameter: Common — Asymptotics: N/T -> 0
Panel means: Included
Time trend: Included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-4.2892	
Adjusted t*	-1.7946	0.0364

Levin–Lin–Chu unit-root test for GDPgrowth

H0: Panels contain unit roots Number of panels = 5
Ha: Panels are stationary Number of periods = 21

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Included

ADF regressions: 0 lags
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-9.4879	
Adjusted t*	-4.4532	0.0000

. xtunitroot llc GDPgrowth , trend lags(1)

Levin–Lin–Chu unit-root test for GDPgrowth

H0: Panels contain unit roots Number of panels = 5
Ha: Panels are stationary Number of periods = 21

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-7.4811	
Adjusted t*	-0.5627	0.2868

Levin–Lin–Chu unit-root test for Inflation

H0: Panels contain unit roots Number of panels = 5
Ha: Panels are stationary Number of periods = 21

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Included

ADF regressions: 0 lags
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-6.9448	

```
 Adjusted t*        -2.0939       0.0181
------------------------------------------------------------------------------

Levin–Lin–Chu unit-root test for Inflation
------------------------------------------
H0: Panels contain unit roots              Number of panels  =      5
Ha: Panels are stationary                  Number of periods =     21

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -7.3752
 Adjusted t*        -1.7227       0.0425
```

```
. xtunitroot llc FDI, lags(0)

Levin–Lin–Chu unit-root test for FDI
------------------------------------
H0: Panels contain unit roots              Number of panels  =      5
Ha: Panels are stationary                  Number of periods =     21

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 0 lags
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -4.6698
 Adjusted t*        -2.2429       0.0125
------------------------------------------------------------------------------

. xtunitroot llc FDI, lags(1)

Levin–Lin–Chu unit-root test for FDI
------------------------------------
H0: Panels contain unit roots              Number of panels  =      5
Ha: Panels are stationary                  Number of periods =     21

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included
```

ADF regressions: 1 lag
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-3.0767	
Adjusted t*	-0.0307	0.4877

. xtunitroot llc COC, lags(0)

Levin–Lin–Chu unit-root test for COC

H0: Panels contain unit roots — Number of panels = 5
Ha: Panels are stationary — Number of periods = 21

AR parameter: Common — Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 0 lags
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-2.3102	
Adjusted t*	-0.1375	0.4453

. xtunitroot llc COC, lags(1)

Levin–Lin–Chu unit-root test for COC

H0: Panels contain unit roots — Number of panels = 5
Ha: Panels are stationary — Number of periods = 21

AR parameter: Common — Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-2.1797	
Adjusted t*	0.1333	0.5530

. xtunitroot llc PS, lags(0)

Levin–Lin–Chu unit-root test for PS

```
----------------------------------
H0: Panels contain unit roots          Number of panels  =      5
Ha: Panels are stationary              Number of periods =     21

AR parameter: Common                   Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 0 lags
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -4.0289
 Adjusted t*        -1.2204       0.1112
------------------------------------------------------------------------------

. xtunitroot llc PS, lags(1)

Levin–Lin–Chu unit-root test for PS
----------------------------------
H0: Panels contain unit roots          Number of panels  =      5
Ha: Panels are stationary              Number of periods =     21

AR parameter: Common                   Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -3.8540
 Adjusted t*        -0.3969       0.3457
------------------------------------------------------------------------------

. xtunitroot llc RQ, lags(0)

Levin–Lin–Chu unit-root test for RQ
----------------------------------
H0: Panels contain unit roots          Number of panels  =      5
Ha: Panels are stationary              Number of periods =     21

AR parameter: Common                   Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 0 lags
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                 Statistic      p-value
```

```
------------------------------------------------------------------------------
 Unadjusted t        -1.0642
 Adjusted t*          0.9054        0.8174
------------------------------------------------------------------------------

. xtunitroot llc RQ, lags(1)

Levin–Lin–Chu unit-root test for RQ
----------------------------------
H0: Panels contain unit roots              Number of panels  =      5
Ha: Panels are stationary                  Number of periods =     21

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         0.0722
 Adjusted t*          2.1426        0.9839
------------------------------------------------------------------------------

. xtunitroot llc ROL, lags(0)

Levin–Lin–Chu unit-root test for ROL
----------------------------------
H0: Panels contain unit roots              Number of panels  =      5
Ha: Panels are stationary                  Number of periods =     21

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 0 lags
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -2.9095
 Adjusted t*         -0.0092        0.4963
------------------------------------------------------------------------------

. xtunitroot llc ROL, lags(1)

Levin–Lin–Chu unit-root test for ROL
----------------------------------
H0: Panels contain unit roots              Number of panels  =      5
Ha: Panels are stationary                  Number of periods =     21
```

```
AR parameter: Common                    Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -3.3110
 Adjusted t*        -0.2434       0.4038
------------------------------------------------------------------------------

. xtunitroot llc GF, lags(0)

Levin–Lin–Chu unit-root test for GF
----------------------------------
H0: Panels contain unit roots             Number of panels  =      5
Ha: Panels are stationary                 Number of periods =     21

AR parameter: Common                    Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 0 lags
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -2.6134
 Adjusted t*        -0.5934       0.2765
------------------------------------------------------------------------------

. xtunitroot llc GF, lags(1)

Levin–Lin–Chu unit-root test for GF
----------------------------------
H0: Panels contain unit roots             Number of panels  =      5
Ha: Panels are stationary                 Number of periods =     21

AR parameter: Common                    Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -1.9113
 Adjusted t*         0.4906       0.6882
------------------------------------------------------------------------------
```

```
. xtunitroot llc VA, lags(0)

Levin–Lin–Chu unit-root test for VA
----------------------------------
H0: Panels contain unit roots              Number of panels  =      5
Ha: Panels are stationary                  Number of periods =     21

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 0 lags
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -1.1345
 Adjusted t*         1.6919       0.9547
------------------------------------------------------------------------------

. xtunitroot llc VA, lags(1)

Levin–Lin–Chu unit-root test for VA
----------------------------------
H0: Panels contain unit roots              Number of panels  =      5
Ha: Panels are stationary                  Number of periods =     21

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -2.6305
 Adjusted t*         0.5998       0.7257
------------------------------------------------------------------------------

. xtunitroot llc GDPgrowth, lags(0)

Levin–Lin–Chu unit-root test for GDPgrowth
-----------------------------------------
H0: Panels contain unit roots              Number of panels  =      5
Ha: Panels are stationary                  Number of periods =     21

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included
```

ADF regressions: 0 lags
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-6.9774	
Adjusted t*	-4.2100	0.0000

. xtunitroot llc GDPgrowth, lags(1)

Levin–Lin–Chu unit-root test for GDPgrowth

H0: Panels contain unit roots — Number of panels = 5
Ha: Panels are stationary — Number of periods = 21

AR parameter: Common — Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-4.4909	
Adjusted t*	-0.5073	0.3060

. xtunitroot llc Inflation, lags(0)

Levin–Lin–Chu unit-root test for Inflation

H0: Panels contain unit roots — Number of panels = 5
Ha: Panels are stationary — Number of periods = 21

AR parameter: Common — Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 0 lags
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-6.1960	
Adjusted t*	-2.9858	0.0014

. xtunitroot llc Inflation, lags(1)

Levin–Lin–Chu unit-root test for Inflation

```
----------------------------------------
H0: Panels contain unit roots          Number of panels =      5
Ha: Panels are stationary              Number of periods =     21

AR parameter: Common                   Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -6.7955
 Adjusted t*        -3.3865       0.0004
------------------------------------------------------------------------------


xtunitroot breitung FDI, trend

Breitung unit-root test for FDI
---------------------------------
H0: Panels contain unit roots          Number of panels =      5
Ha: Panels are stationary              Number of periods =     21

AR parameter: Common                   Asymptotics:  T,N -> Infinity
Panel means:  Included                               sequentially
Time trend:   Included                 Prewhitening: Not performed
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 lambda             -0.6431       0.2601
------------------------------------------------------------------------------

. xtunitroot breitung COC, trend

Breitung unit-root test for COC
---------------------------------
H0: Panels contain unit roots          Number of panels =      5
Ha: Panels are stationary              Number of periods =     21

AR parameter: Common                   Asymptotics:  T,N -> Infinity
Panel means:  Included                               sequentially
Time trend:   Included                 Prewhitening: Not performed
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 lambda             -0.2977       0.3830
------------------------------------------------------------------------------

. xtunitroot breitung PS, trend

Breitung unit-root test for PS
---------------------------------
H0: Panels contain unit roots          Number of panels =      5
Ha: Panels are stationary              Number of periods =     21

AR parameter: Common                   Asymptotics:  T,N -> Infinity
Panel means:  Included                               sequentially
Time trend:   Included                 Prewhitening: Not performed
```

```
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 lambda          -0.8062        0.2101
------------------------------------------------------------------------------
```

. xtunitroot breitung RQ, trend

Breitung unit-root test for RQ

```
------------------------------
H0: Panels contain unit roots          Number of panels  =     5
Ha: Panels are stationary              Number of periods =    21

AR parameter: Common                   Asymptotics:  T,N -> Infinity
Panel means:  Included                                sequentially
Time trend:   Included                 Prewhitening: Not performed
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 lambda          0.3137        0.6231
------------------------------------------------------------------------------
```

. xtunitroot breitung ROL, trend

Breitung unit-root test for ROL

```
---------------------------------
H0: Panels contain unit roots          Number of panels  =     5
Ha: Panels are stationary              Number of periods =    21

AR parameter: Common                   Asymptotics:  T,N -> Infinity
Panel means:  Included                                sequentially
Time trend:   Included                 Prewhitening: Not performed
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 lambda          0.3557        0.6389
------------------------------------------------------------------------------
```

. xtunitroot breitung GF, trend

Breitung unit-root test for GF

```
------------------------------
H0: Panels contain unit roots          Number of panels  =     5
Ha: Panels are stationary              Number of periods =    21

AR parameter: Common                   Asymptotics:  T,N -> Infinity
Panel means:  Included                                sequentially
Time trend:   Included                 Prewhitening: Not performed
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 lambda          0.5527        0.7098
------------------------------------------------------------------------------
```

. xtunitroot breitung VA, trend

Breitung unit-root test for VA

```
------------------------------
H0: Panels contain unit roots          Number of panels  =     5
Ha: Panels are stationary              Number of periods =    21

AR parameter: Common                   Asymptotics:  T,N -> Infinity
Panel means:  Included                                sequentially
```

```
Time trend:   Included                  Prewhitening: Not performed
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 lambda          1.8053        0.9645
------------------------------------------------------------------------------
```

```
. xtunitroot breitung GDPgrowth, trend

Breitung unit-root test for GDPgrowth
--------------------------------------
H0: Panels contain unit roots           Number of panels  =     5
Ha: Panels are stationary               Number of periods =    21

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                sequentially
Time trend:   Included                  Prewhitening: Not performed
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 lambda          0.3987        0.6550
------------------------------------------------------------------------------
```

```
. xtunitroot breitung Inflation, trend

Breitung unit-root test for Inflation
--------------------------------------
H0: Panels contain unit roots           Number of panels  =     5
Ha: Panels are stationary               Number of periods =    21

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                sequentially
Time trend:   Included                  Prewhitening: Not performed
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 lambda         -0.3160        0.3760
```

```
. xtunitroot breitung FDI

Breitung unit-root test for FDI
--------------------------------
H0: Panels contain unit roots           Number of panels  =     5
Ha: Panels are stationary               Number of periods =    21

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                sequentially
Time trend:   Not included              Prewhitening: Not performed
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 lambda         -2.7795        0.0027
------------------------------------------------------------------------------
```

```
. xtunitroot breitung COC

Breitung unit-root test for COC
--------------------------------
H0: Panels contain unit roots           Number of panels  =     5
Ha: Panels are stationary               Number of periods =    21

AR parameter: Common                    Asymptotics:  T,N -> Infinity
```

```
Panel means:  Included                          sequentially
Time trend:   Not included              Prewhitening: Not performed
--------------------------------------------------------------------------------
                Statistic      p-value
--------------------------------------------------------------------------------
 lambda          -0.0351        0.4860
--------------------------------------------------------------------------------

. xtunitroot breitung PS

Breitung unit-root test for PS
------------------------------
H0: Panels contain unit roots           Number of panels  =     5
Ha: Panels are stationary               Number of periods =    21

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                          sequentially
Time trend:   Not included              Prewhitening: Not performed
--------------------------------------------------------------------------------
                Statistic      p-value
--------------------------------------------------------------------------------
 lambda          -1.0048        0.1575
--------------------------------------------------------------------------------

. xtunitroot breitung RQ

Breitung unit-root test for RQ
------------------------------
H0: Panels contain unit roots           Number of panels  =     5
Ha: Panels are stationary               Number of periods =    21

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                          sequentially
Time trend:   Not included              Prewhitening: Not performed
--------------------------------------------------------------------------------
                Statistic      p-value
--------------------------------------------------------------------------------
 lambda           1.2574        0.8957
--------------------------------------------------------------------------------

. xtunitroot breitung ROL

Breitung unit-root test for ROL
-------------------------------
H0: Panels contain unit roots           Number of panels  =     5
Ha: Panels are stationary               Number of periods =    21

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                          sequentially
Time trend:   Not included              Prewhitening: Not performed
--------------------------------------------------------------------------------
                Statistic      p-value
--------------------------------------------------------------------------------
 lambda          -2.0363        0.0209
--------------------------------------------------------------------------------

. xtunitroot breitung GF

Breitung unit-root test for GF
------------------------------
H0: Panels contain unit roots           Number of panels  =     5
Ha: Panels are stationary               Number of periods =    21
```

```
AR parameter: Common                     Asymptotics:  T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Not included               Prewhitening: Not performed
--------------------------------------------------------------------------------
                 Statistic      p-value
--------------------------------------------------------------------------------
 lambda             0.4309       0.6667
--------------------------------------------------------------------------------

. xtunitroot breitung VA

Breitung unit-root test for VA
------------------------------
H0: Panels contain unit roots            Number of panels  =     5
Ha: Panels are stationary                Number of periods =    21

AR parameter: Common                     Asymptotics:  T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Not included               Prewhitening: Not performed
--------------------------------------------------------------------------------
                 Statistic      p-value
--------------------------------------------------------------------------------
 lambda             0.7559       0.7752
--------------------------------------------------------------------------------

. xtunitroot breitung GDPgrowth

Breitung unit-root test for GDPgrowth
-------------------------------------
H0: Panels contain unit roots            Number of panels  =     5
Ha: Panels are stationary                Number of periods =    21

AR parameter: Common                     Asymptotics:  T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Not included               Prewhitening: Not performed
--------------------------------------------------------------------------------
                 Statistic      p-value
--------------------------------------------------------------------------------
 lambda            -5.1695       0.0000
--------------------------------------------------------------------------------

. xtunitroot breitung Inflation

Breitung unit-root test for Inflation
-------------------------------------
H0: Panels contain unit roots            Number of panels  =     5
Ha: Panels are stationary                Number of periods =    21

AR parameter: Common                     Asymptotics:  T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Not included               Prewhitening: Not performed
--------------------------------------------------------------------------------
                 Statistic      p-value
--------------------------------------------------------------------------------
 lambda            -3.7050       0.0001
--------------------------------------------------------------------------------

. xtunitroot breitung Inflation

Breitung unit-root test for Inflation
-------------------------------------
H0: Panels contain unit roots            Number of panels  =     5
Ha: Panels are stationary                Number of periods =    21
```

```
AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                              sequentially
Time trend:   Not included              Prewhitening: Not performed
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 lambda          -3.7050        0.0001
------------------------------------------------------------------------------



. xtunitroot ips FDI, trend lags(0)

Im–Pesaran–Shin unit-root test for FDI
-------------------------------------
H0: All panels contain unit roots         Number of panels  =      5
Ha: Some panels are stationary              Number of periods =     21

AR parameter: Panel-specific              Asymptotics: T,N -> Infinity
Panel means:  Included                              sequentially
Time trend:   Included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar         -3.1298        0.0009
------------------------------------------------------------------------------

. xtunitroot ips FDI, trend lags(1)

Im–Pesaran–Shin unit-root test for FDI
---------------------------------------
H0: All panels contain unit roots         Number of panels  =      5
Ha: Some panels are stationary              Number of periods =     21

AR parameter: Panel-specific              Asymptotics: T,N -> Infinity
Panel means:  Included                              sequentially
Time trend:   Included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar         -1.0868        0.1386
------------------------------------------------------------------------------

. xtunitroot ips COC, trend lags(0)

Im–Pesaran–Shin unit-root test for COC
-------------------------------------
H0: All panels contain unit roots         Number of panels  =      5
Ha: Some panels are stationary              Number of periods =     21

AR parameter: Panel-specific              Asymptotics: T,N -> Infinity
Panel means:  Included                              sequentially
Time trend:   Included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
```

```
 W-t-bar             0.1457       0.5579
------------------------------------------------------------------------------

. xtunitroot ips COC, trend lags(1)

Im–Pesaran–Shin unit-root test for COC
--------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar            -0.3969       0.3457
------------------------------------------------------------------------------

. xtunitroot ips PS, trend lags(0)

Im–Pesaran–Shin unit-root test for PS
-------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar            -1.4091       0.0794
------------------------------------------------------------------------------

. xtunitroot ips PS, trend lags(1)

Im–Pesaran–Shin unit-root test for PS
-------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar            -0.1718       0.4318
------------------------------------------------------------------------------

. xtunitroot ips RQ, trend lags(0)

Im–Pesaran–Shin unit-root test for RQ
-------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21
```

```
AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar          -1.7905        0.0367
------------------------------------------------------------------------------

. xtunitroot ips RQ, trend lags(1)

Im–Pesaran–Shin unit-root test for RQ
-------------------------------------
H0: All panels contain unit roots          Number of panels  =      5
Ha: Some panels are stationary               Number of periods =     21

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar           0.2979        0.6171
------------------------------------------------------------------------------

. xtunitroot ips ROL, trend lags(0)

Im–Pesaran–Shin unit-root test for ROL
--------------------------------------
H0: All panels contain unit roots          Number of panels  =      5
Ha: Some panels are stationary               Number of periods =     21

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar           0.0006        0.5002
------------------------------------------------------------------------------

. xtunitroot ips ROL, trend lags(1)

Im–Pesaran–Shin unit-root test for ROL
--------------------------------------
H0: All panels contain unit roots          Number of panels  =      5
Ha: Some panels are stationary               Number of periods =     21

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
```

```
 W-t-bar            0.3135       0.6230
------------------------------------------------------------------------------

. xtunitroot ips GF, trend lags(0)

Im–Pesaran–Shin unit-root test for GF
--------------------------------------
H0: All panels contain unit roots        Number of panels  =     5
Ha: Some panels are stationary             Number of periods =    21

AR parameter: Panel-specific              Asymptotics: T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar           -1.2390       0.1077
------------------------------------------------------------------------------

. xtunitroot ips GF, trend lags(1)

Im–Pesaran–Shin unit-root test for GF
--------------------------------------
H0: All panels contain unit roots        Number of panels  =     5
Ha: Some panels are stationary             Number of periods =    21

AR parameter: Panel-specific              Asymptotics: T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar            0.5338       0.7033
------------------------------------------------------------------------------

. xtunitroot ips VA, trend lags(0)

Im–Pesaran–Shin unit-root test for VA
--------------------------------------
H0: All panels contain unit roots        Number of panels  =     5
Ha: Some panels are stationary             Number of periods =    21

AR parameter: Panel-specific              Asymptotics: T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar            1.4827       0.9309
------------------------------------------------------------------------------

. xtunitroot ips VA, trend lags(1)

Im–Pesaran–Shin unit-root test for VA
--------------------------------------
H0: All panels contain unit roots        Number of panels  =     5
Ha: Some panels are stationary             Number of periods =    21
```

```
AR parameter: Panel-specific          Asymptotics: T,N -> Infinity
Panel means:  Included                          sequentially
Time trend:   Included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar          0.1714        0.5680
------------------------------------------------------------------------------

. xtunitroot ips GDPgrowth, trend lags(0)

Im–Pesaran–Shin unit-root test for GDPgrowth
-----------------------------------------
H0: All panels contain unit roots         Number of panels  =      5
Ha: Some panels are stationary              Number of periods =     21

AR parameter: Panel-specific          Asymptotics: T,N -> Infinity
Panel means:  Included                          sequentially
Time trend:   Included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar          -4.7423        0.0000
------------------------------------------------------------------------------

. xtunitroot ips GDPgrowth, trend lags(1)

Im–Pesaran–Shin unit-root test for GDPgrowth
-----------------------------------------
H0: All panels contain unit roots         Number of panels  =      5
Ha: Some panels are stationary              Number of periods =     21

AR parameter: Panel-specific          Asymptotics: T,N -> Infinity
Panel means:  Included                          sequentially
Time trend:   Included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar          -2.2419        0.0125
------------------------------------------------------------------------------

. xtunitroot ips Inflation, trend lags(0)

Im–Pesaran–Shin unit-root test for Inflation
-----------------------------------------
H0: All panels contain unit roots         Number of panels  =      5
Ha: Some panels are stationary              Number of periods =     21

AR parameter: Panel-specific          Asymptotics: T,N -> Infinity
Panel means:  Included                          sequentially
Time trend:   Included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
```

```
 W-t-bar           -2.5216       0.0058
------------------------------------------------------------------------------

. xtunitroot ips Inflation, trend lags(1)

Im–Pesaran–Shin unit-root test for Inflation
---------------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar           -2.9397       0.0016
------------------------------------------------------------------------------

. xtunitroot ips FDI, lags(0)

Im–Pesaran–Shin unit-root test for FDI
--------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Not included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar           -2.0509       0.0201
------------------------------------------------------------------------------

. xtunitroot ips FDI, lags(1)

Im–Pesaran–Shin unit-root test for FDI
--------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Not included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar           -0.0547       0.4782
------------------------------------------------------------------------------

. xtunitroot ips COC, lags(0)

Im–Pesaran–Shin unit-root test for COC
--------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21
```

```
AR parameter: Panel-specific              Asymptotics: T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Not included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar            1.0536        0.8540
------------------------------------------------------------------------------

. xtunitroot ips COC, lags(1)

Im–Pesaran–Shin unit-root test for COC
-------------------------------------
H0: All panels contain unit roots          Number of panels  =      5
Ha: Some panels are stationary               Number of periods =     21

AR parameter: Panel-specific              Asymptotics: T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Not included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar            1.3386        0.9096
------------------------------------------------------------------------------

. xtunitroot ips PS, lags(0)

Im–Pesaran–Shin unit-root test for PS
-------------------------------------
H0: All panels contain unit roots          Number of panels  =      5
Ha: Some panels are stationary               Number of periods =     21

AR parameter: Panel-specific              Asymptotics: T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Not included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar           -1.1543        0.1242
------------------------------------------------------------------------------

. xtunitroot ips PS, lags(1)

Im–Pesaran–Shin unit-root test for PS
-------------------------------------
H0: All panels contain unit roots          Number of panels  =      5
Ha: Some panels are stationary               Number of periods =     21

AR parameter: Panel-specific              Asymptotics: T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Not included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                 Statistic      p-value
------------------------------------------------------------------------------
```

```
 W-t-bar           -0.4681       0.3199
------------------------------------------------------------------------------

. xtunitroot ips RQ, lags(0)

Im–Pesaran–Shin unit-root test for RQ
-------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Not included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar           1.3182       0.9063
------------------------------------------------------------------------------

. xtunitroot ips RQ, lags(1)

Im–Pesaran–Shin unit-root test for RQ
-------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Not included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar           2.2077       0.9864
------------------------------------------------------------------------------

. xtunitroot ips ROL, lags(0)

Im–Pesaran–Shin unit-root test for ROL
--------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Not included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar           0.2291       0.5906
------------------------------------------------------------------------------

. xtunitroot ips ROL, lags(1)

Im–Pesaran–Shin unit-root test for ROL
--------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21
```

```
AR parameter: Panel-specific          Asymptotics: T,N -> Infinity
Panel means:  Included                             sequentially
Time trend:   Not included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar          0.1985        0.5787
------------------------------------------------------------------------------

. xtunitroot ips GF, lags(0)

Im–Pesaran–Shin unit-root test for GF
-------------------------------------
H0: All panels contain unit roots          Number of panels  =      5
Ha: Some panels are stationary               Number of periods =     21

AR parameter: Panel-specific          Asymptotics: T,N -> Infinity
Panel means:  Included                             sequentially
Time trend:   Not included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar          0.1604        0.5637
------------------------------------------------------------------------------

. xtunitroot ips GF, lags(1)

Im–Pesaran–Shin unit-root test for GF
-------------------------------------
H0: All panels contain unit roots          Number of panels  =      5
Ha: Some panels are stationary               Number of periods =     21

AR parameter: Panel-specific          Asymptotics: T,N -> Infinity
Panel means:  Included                             sequentially
Time trend:   Not included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar          1.1826        0.8815
------------------------------------------------------------------------------

. xtunitroot ips VA, lags(0)

Im–Pesaran–Shin unit-root test for VA
-------------------------------------
H0: All panels contain unit roots          Number of panels  =      5
Ha: Some panels are stationary               Number of periods =     21

AR parameter: Panel-specific          Asymptotics: T,N -> Infinity
Panel means:  Included                             sequentially
Time trend:   Not included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
```

```
 W-t-bar            1.7535       0.9602
------------------------------------------------------------------------------

. xtunitroot ips VA, lags(1)

Im–Pesaran–Shin unit-root test for VA
--------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Not included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar            0.3074       0.6207
------------------------------------------------------------------------------

. xtunitroot ips GDPgrowth, lags(0)

Im–Pesaran–Shin unit-root test for GDPgrowth
---------------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Not included

ADF regressions: 0 lags
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar           -3.9880       0.0000
------------------------------------------------------------------------------

. xtunitroot ips GDPgrowth, lags(1)

Im–Pesaran–Shin unit-root test for GDPgrowth
---------------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Not included

ADF regressions: 1 lag
------------------------------------------------------------------------------
                Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar           -1.2936       0.0979
------------------------------------------------------------------------------

. xtunitroot ips Inflation, lags(0)

Im–Pesaran–Shin unit-root test for Inflation
---------------------------------------------
H0: All panels contain unit roots         Number of panels  =     5
Ha: Some panels are stationary              Number of periods =    21
```

AR parameter: Panel-specific Asymptotics: T,N -> Infinity
Panel means: Included sequentially
Time trend: Not included

ADF regressions: 0 lags

	Statistic	p-value
W-t-bar	-3.0056	0.0013

. xtunitroot ips Inflation, lags(1)

Im–Pesaran–Shin unit-root test for Inflation

H0: All panels contain unit roots Number of panels = 5
Ha: Some panels are stationary Number of periods = 21

AR parameter: Panel-specific Asymptotics: T,N -> Infinity
Panel means: Included sequentially
Time trend: Not included

ADF regressions: 1 lag

	Statistic	p-value
W-t-bar	-3.2051	0.0007

ARDL

Dependent Variable: D(FOREIGN)
Method: ARDL
Date: 04/22/24 Time: 13:21
Sample: 2005 2022
Included observations: 90
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): CONTROL(-2) GDP GOVERNMENT POLITICAL INFLATION REGULATORY RULE VOICE
Fixed regressors: C
Number of models evalulated: 1
Selected Model: ARDL(1, 1, 1, 1, 1, 1, 1, 1, 1)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long Run Equation				
CONTROL(-2)	0.197454	0.021363	9.242957	0.0000
GDP	0.100735	0.043307	2.326034	0.0256
GOVERNMENT	-0.169134	0.016540	-10.22597	0.0000
POLITICAL	-0.046560	0.038274	-1.216479	0.2315
INFLATION	0.002356	0.026733	0.088148	0.9302
REGULATORY	-0.031173	0.016840	-1.851089	0.0722
RULE	0.071798	0.035491	2.022989	0.0503
VOICE	0.132584	0.032836	4.037786	0.0003

Short Run Equation				
COINTEQ01	-0.838721	0.477816	-1.755321	0.0875
D(CONTROL(-2))	-0.180277	0.150099	-1.201058	0.2374
D(GDP)	-0.029201	0.031416	-0.929491	0.3587
D(GOVERNMENT)	0.150740	0.100692	1.497036	0.1429
D(POLITICAL)	-0.090871	0.056279	-1.614662	0.1149
D(INFLATION)	0.001901	0.032062	0.059306	0.9530
D(REGULATORY)	-0.036376	0.059303	-0.613402	0.5434
D(RULE)	0.044873	0.046206	0.971143	0.3378
D(VOICE)	0.026170	0.085737	0.305235	0.7619
C	-1.045034	3.205274	-0.326036	0.7462

Brazel

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.704680	0.013356	-52.76145	0.0000
D(CONTROL)	0.112669	0.000391	288.3526	0.0000
D(GDP)	0.114291	0.000567	201.5869	0.0000
D(GOVERNMENT)	0.084401	0.000187	451.4663	0.0000
D(INFLATION)	0.005169	0.001493	3.460793	0.0406
D(POLITICAL)	0.015550	0.000188	82.75347	0.0000
D(REGULATORY)	-0.159033	0.001124	-141.4339	0.0000
D(RULE)	-0.040202	0.000478	-84.04444	0.0000
D(VOICE)	0.275881	0.003240	85.14667	0.0000
C	0.385023	1.679375	0.229266	0.8334

china

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.095098	0.004668	-20.37171	0.0003
D(CONTROL)	-0.029975	0.000503	-59.59073	0.0000
D(GDP)	0.028903	0.003378	8.556730	0.0034
D(GOVERNMENT)	0.024436	0.000805	30.36474	0.0001
D(INFLATION)	-0.071833	0.001519	-47.28624	0.0000
D(POLITICAL)	-0.083944	0.001876	-44.75762	0.0000
D(REGULATORY)	0.075328	0.000584	128.8835	0.0000
D(RULE)	-0.000661	0.001836	-0.360032	0.7427
D(VOICE)	0.034626	0.013884	2.493932	0.0882
C	0.307077	0.115767	2.652545	0.0768

india

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.277418	0.028600	-9.699799	0.0023
D(CONTROL)	-0.023478	0.003732	-6.291738	0.0081
D(GDP)	0.032258	0.001396	23.11574	0.0002
D(GOVERNMENT)	0.016228	0.000680	23.85409	0.0002
D(INFLATION)	-0.089760	0.011615	-7.727954	0.0045
D(POLITICAL)	0.094721	0.008289	11.42666	0.0014
D(REGULATORY)	0.015727	0.003808	4.130422	0.0257

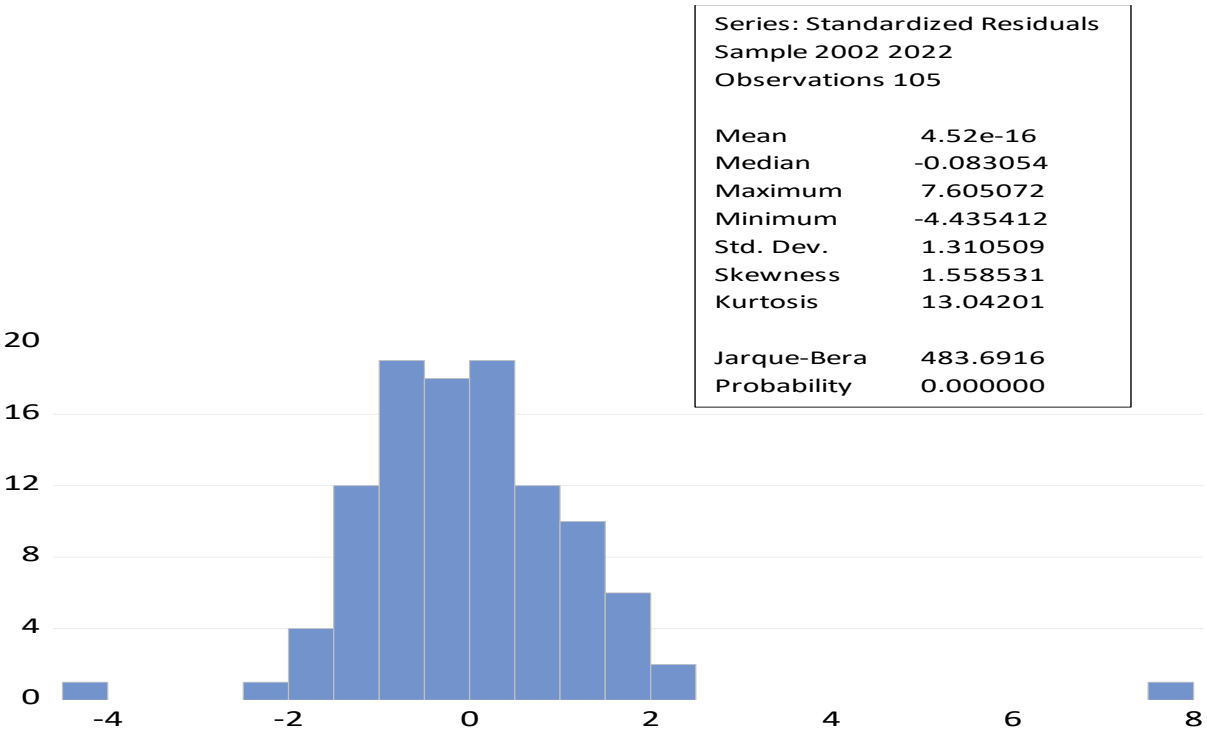
D(RULE)	0.000793	0.006534	0.121358	0.9111
D(VOICE)	-0.108278	0.010759	-10.06359	0.0021
C	-0.512968	0.316025	-1.623187	0.2030

Russian federation

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.702144	0.066257	-10.59734	0.0018
D(CONTROL)	-0.219088	0.029527	-7.419946	0.0051
D(GDP)	0.094419	0.004319	21.85992	0.0002
D(GOVERNMENT)	0.111534	0.005821	19.16124	0.0003
D(INFLATION)	-0.097229	0.001746	-55.69830	0.0000
D(POLITICAL)	0.122647	0.009413	13.02957	0.0010
D(REGULATORY)	0.189463	0.004273	44.34127	0.0000
D(RULE)	-0.073593	0.008434	-8.725313	0.0032
D(VOICE)	-0.374638	0.033077	-11.32636	0.0015
C	1.270577	0.502469	2.528669	0.0855

south Africa

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-1.144172	0.042961	-26.63253	0.0001
D(CONTROL)	-0.033600	0.005098	-6.590618	0.0071
D(GDP)	-0.010763	0.012935	-0.832089	0.4664
D(GOVERNMENT)	0.221361	0.007699	28.75344	0.0001
D(INFLATION)	0.154061	0.016492	9.341315	0.0026
D(POLITICAL)	-0.123419	0.005128	-24.06936	0.0002
D(REGULATORY)	-0.186501	0.007745	-24.08143	0.0002
D(RULE)	0.254644	0.003902	65.26073	0.0000
D(VOICE)	-0.327206	0.050338	-6.500112	0.0074
C	-1.400916	5.345155	-0.262091	0.8102




```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,       4) =      1.067
           Prob > F =      0.3600
```

Variable	VIF	1/VIF
COC	8.35	0.119737
VA	6.63	0.150747
ROL	6.50	0.153905
RQ	4.60	0.217321
GF	4.56	0.219468
PS	3.04	0.329149
Inflation	1.89	0.529723
GDPgrowth	1.49	0.670947
Mean VIF	4.63	