


# Harnessing Foreign Direct Investment and Regulatory Quality to Transform the Resource Curse into Economic Growth in the East African Community

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## Abstract

The analysis of natural resources for economic growth is well-documented in the literature. However, previous studies have often pointed out the potential of FDI and regulatory quality to either make the resource curse worse or mitigate it. The objective of this study fills a gap observed in the literature by seeking to delve deeper into this complex interplay by focusing specifically on how the quality of regulation and FDI can mitigate the resource curse when each interacts with natural resources in the EAC. The main models used are the OLS and 2SLS methods, based on panel data covering a long period: from 1996 to 2022. Aside from these, some other approaches are used, like FE without AR(1) specifications and GMM, to check results and assure the stability of findings. The empirical results first confirm the resource curse; second, when FDI and regulatory quality are combined with natural resources, the negative impact of natural resources on GDP growth can be reversed to bring out the resource blessing in EAC countries. The paper suggests that the EAC countries should strengthen the regulatory frameworks that ensure transparency and sustainability in the management of their resources. By attracting strategic FDI and promoting economic diversification, these countries can transform natural resource wealth into sustainable growth.

## Keywords

Resource Curse, FDI, Regulatory Quality, FE AR(1), GMM, OLS, 2SLS, Economic Growth, EAC

## 1. Introduction

Exploitation of natural resources is a major source of economic growth for many nations. However, this growth also brings along economic aspects that are often considered as weaknesses, termed as “resource curse” type of phenomena (Allcott & Keniston, 2014; Carmignani, 2013; Aragón & Rud, 2013; Frankel, 2012; Van der Ploeg, 2011; Rosser, 2006; Sala-i-Martin & Subramanian, 2013; Badeeb et al., 2017; Gu et al., 2020). Natural resources are essential in production processes, people’s welfare and development of nations (Bansal et al., 2021; Chopra et al., 2022). Resources form part of a country’s wealth and should be responsibly exploited to promote growth (World Bank, 2011).

Both developed and developing countries face challenges in preventing over-exploitation of natural wealth while pursuing economic growth. As a result, the need arises for policy advocates as well as policymakers to effectively find and put forward measures that would encourage the efficient use of natural resources and enhance sustainable production and consumption of natural resources (Dogan, 2016; Hassan et al., 2019; Lampert, 2019; Altinoz & Dogan, 2021). Furthermore, there are some economic activities that lead to wasting some of the scarce natural resources, and for sure, these are likely to contribute negatively towards sustainable development (Ramzan et al., 2022; Shahzad et al., 2022).

Natural resources are able to provide a lot of earnings from the exports, which can in turn increase the GDP, but if overdependence is there on natural resource management, then there will be shortage of economic diversification in the future (Hunjra et al., 2024; Tang et al., 2022; Yu et al., 2021). Also, the use of these resources will have extensive effects on the environment, such as loss of biodiversity, more deforestation and emissions of carbon dioxide gas, which can affect production and finally the GDP growth (Asif et al., 2020; Haseeb et al., 2021).

Foreign Direct Investment or FDI is a key element that propels economic growth and development. It is a phenomenon commonly embraced by both the developed and developed world as a key strategy for development. The European Commission has described it in following terms: “FDI can be considered as a source of competitiveness and economic development”. During the period of pandemic of COVID-19, the World Bank stressed that in recovery, FDI is crucial. This view is not new; an article by the IMF in 1999 stated: “Since FDI is deemed useful for economic development, every country is eager to receive whatever FDI it can get”. FDI is likely to turn around the stagnation caused by the vicious cycle of underdevelopment and spur improvements in economies (Herzer, 2012; Mencinger, 2003). Though deploying zero or almost zero marginal production factors, FDI contributes to the growth trends of the developing countries (Ali & Asgher, 2016). It furthermore contributes to a greater income distribution, which in turn helps to increase economic growth and the advancement of education and health in the entire country through higher use of unskilled labor, tax contributions, and lower costs (Carp, 2012). It also implements growth through the increase of manufacturing

exports, further promoting programs of FDI (McMillan et al., 2017).

Significant economic improvement was also accomplished by certain Asian nations, such as South Korea and Singapore, with major inflows of foreign direct investment (FDI) (Chaudhury et al., 2020).

Resource abundance is also a factor in attracting FDI inflows, as Kekic (2005) noted. But Asiedu and Lien (2011) found that resource-rich countries channel FDI inflows mainly into the resources sector and potentially reduces FDI in non-resources sectors. This diversion can reduce positive spillovers and technology transfer (Asiedu, 2006). So, the larger size of the resources sector can dampen the potential for FDI-induced growth. Resource-rich countries experience limited FDI-induced growth, while countries with less resources tend to benefit more from FDI-induced growth. The limitation of linear models is that they assume the growth effect of FDI to be monotonously decreasing (or increasing) with the increase (or decrease) in the size of the resources sector in a country (Hayat, 2018). Poelhekke and van der Ploeg (2013) also found a negative relationship between natural resource abundance and FDI inflows. Their findings suggest that countries with large natural resources may experience reduced FDI inflows as investors may perceive these economies as less diversified and more prone to economic volatility.

Based on the above studies, it is logical to conclude that FDI inflows could be negatively influenced in countries with large natural resource endowments. This is because the concentration of FDI in the resources sector can limit the broader economic benefits of FDI, such as technology transfer, skill development and industrial diversification. So, resource-rich countries may have challenges in leveraging FDI for sustainable economic growth and development.

Regulatory quality is said to have a significant impact on moderating the relationship between financial development and economic growth. The Economist (June 2009) reported that the International Monetary Fund (IMF) attributed inadequate regulation rather than global imbalances as the main cause of the Global Financial Crisis of 2008. It said the major issues that caused this crisis were bad regulations and lack of market discipline. Regulatory quality is a key determinant in the ability of the regulatory system to ensure transparency, fairness and efficiency in managing economic and social activities.

Assessing a country's regulatory quality covers various aspects, including the transparency and fairness of regulations, ability to mitigate corruption manifestations and effectiveness in policy implementation, creating an open and fair business environment. Deficient regulatory quality can lead to market risks and challenges to fairness and development (Ciftci & Durusu-Ciftci, 2022). If a country has strong institutions before it discovers a natural resource, it is more likely to escape the resource curse than a country with weak institutions (Wiens, 2014). Regulatory quality plays a significant moderating role in reducing the negative impact of natural resource rent on the environment. Strengthening regulatory quality and implementing environment-friendly policies will ensure environmental sustainability.

There's a noticeable gap in our understanding of how regulatory quality interacts with Foreign Direct Investment (FDI) in relation to natural resources and their economic impacts. This study aims to bridge that gap by looking specifically at the East African Community (EAC), which is rich in natural resources and has various regulatory frameworks, presenting both unique challenges and exciting opportunities. Using a mixed econometric approach with data from 1996 to 2022, this research explores the intricate relationships among these factors and how they affect GDP growth.

This research adds valuable insights into the existing literature in several key ways. First, it quantitatively measures how natural resources contribute to economic development, which can guide sustainable resource management. Second, it examines how FDI and the quality of regulatory frameworks either support or hinder GDP growth. The study also investigates the interplay between Foreign Direct Investment (FDI) and natural resources in their collective impact on economic performance. It also examines the interplay between regulatory quality and natural resources in influencing economic results.

The findings offer significant implications for policymakers, governments in the EAC, and scholars. They provide practical insights that can help develop tailored strategies for fostering sustainable economic growth, turning the resource curse into a valuable opportunity for these countries. By applying a robust micro-econometric model, the study bolsters the credibility of its findings and creates a flexible framework that can adapt to different contexts, allowing for a better understanding of how natural resources, foreign investment, regulatory quality, and GDP growth interrelate.

Ultimately, the insights from this research are essential for shaping effective policies that can leverage the EAC's abundant natural resources to foster sustainable economic growth. Policymakers can utilize these findings to craft regulatory frameworks that strategically attract FDI, encourage economic diversification, and promote environmental sustainability. By creating a conducive environment for investment and development, EAC nations can overcome the challenges associated with the resource curse and set the stage for long-term economic success.

#### **Motivation for the Choice of the East African Community (EAC)**

For this investigation, we focus specifically on the East African Community (EAC) to look at how favorable regulations and Foreign Direct Investment (FDI) can turn the resource curse into an avenue for economic growth. The EAC is made up of 8 member countries—the Republic of Burundi, the Democratic Republic of the Congo, the Republic of Kenya, the Republic of Rwanda, the Federal Republic of Somalia, the Republic of South Sudan, the Republic of Uganda, and the United Republic of Tanzania—that are rich in valuable natural resources like minerals, oil, and gas. Despite this wealth, these nations often face challenges that come with the resource curse, such as economic instability, corruption, and underdevelopment. Our study offers a fresh take by highlighting the importance of regulatory quality

in the EAC, which can greatly impact how these resources are managed and exploited.

While many studies have looked into how institutional quality and FDI can help reduce the effects of the resource curse in developing nations, our research tackles a crucial gap by honing in on the quality of regulatory frameworks. Regulatory quality is basically the government's skill in creating and enforcing effective rules that support private sector growth, and it plays a key role in determining economic outcomes. Since regulatory quality and its ability to attract foreign investment vary across different regions and countries, it's important to take a localized approach. Making broad generalizations about all developing nations doesn't do justice to the unique complexities of each environment. By concentrating on the EAC, we want to gain a deeper understanding of how strong regulations can improve resource management and draw in foreign direct investment, ultimately driving economic development.

To add to what is already known in the academic world, our study looks at how regulatory quality, foreign direct investment (FDI), and natural resources affect economic growth together. By looking at the East African Community (EAC), our study hopes to offer new perspectives, since this resource-rich area doesn't get as much attention in in-depth studies of growing economies. Our analysis is based on the East African Community (EAC) rather than the entire African continent. Through this method, we gain improved knowledge about the interconnectedness of regulatory quality with foreign direct investment and natural resources, which leads to economic growth in the East African Community region.

Our methodology involves analyzing data from 1996 to 2022, resulting in 162 observations across five key variables. This thorough approach not only sheds light on the dynamics of the EAC but also helps us understand how these nations can effectively harness their natural resource wealth to achieve sustainable economic growth.

By addressing the gap in knowledge regarding the role of regulatory quality in resource management, our research provides valuable insights to policymakers within the EAC on how to leverage foreign direct investment and regulatory enhancements for sustainable development. This study highlights the region's potential to turn its abundant natural resources into a springboard for progress, ultimately offering a model for other resource-rich areas. We stress the importance of tailored strategies that consider the unique regulatory and economic contexts of each member state, all aimed at creating a fairer and more prosperous future for the EAC.

## **2. Literature Review**

### **2.1. Theoretical Literature**

There is still a lot of debate in economic development about the link between natural resources and economic growth. A core question still stands: Is having too many natural resources good for or bad for the economy? The seminal study by Sachs and

Warner in 1995 introduced the “resource curse”, which shows that countries with lots of natural resources tend to have slower economic growth than countries with few resources. This important study paved the way for more research into the complicated link between having lots of resources and economic growth (Sachs & Warner, 1995).

The research by Sachs and Warner showed that the resource curse isn’t just caused by the abundance of resources; it’s also linked to government, the strength of institutions, and economic strategy. The results led to a lot of research into how countries can avoid the problems that come with being too dependent on resources and use their natural wealth for long-term growth (Sachs & Warner, 1995).

Many research studies have looked at how government, the quality of regulations, and Foreign Direct Investment (FDI) can help lessen the bad effects of the resource curse. Scientists have looked into how strong structures and good rules can turn having a lot of natural resources into a way to help the economy grow and diversify (Sachs & Warner, 1995).

In writing from the 1990s, the “curse” was often seen as a fact that couldn’t be argued with. This view was based on a measure that looked at main exports as a share of GDP and how dependent a country was on natural resources rather than how readily available they were. The study focused on the links between relying on natural resources and economic growth, focusing on well-known factors like the development of useful parts and new technologies.

Even so, the research has made steady progress by including administrative systems in the examination. There are three main reasons for this change: 1) institutions have become more important in modern economics; 2) who owns natural resources, including both the assets and the money made from using them, is a major issue; and 3) interest groups and the government play key roles in setting up the property system.

The results of these studies have not been clear-cut, but most people think that there is some kind of “conditionality” at play. The most common view is that the quality of institutions is very important in deciding whether natural resources are a burden or a gift. In places with lots of natural resources, strong organizations may help the economy do better, which would lessen the effect of the resource curse.

## 2.2. Empirical Literature

Auty (1994) started the resource curse debate by saying that having a lot of resources could be more of a curse than a gift because it could lead to industrialization, which would slow down economic growth in the long run. Since this important work, a lot of new writing has come out that looks into what the resource curse is Atienza (2019). A thorough review by Alssadek and Benhin (2023) shows that there are mixed findings about how natural resources affect growth. Many of the studies found a positive rather than a negative link. They also look at real-world evidence for ideas about why there is a negative link between resources and

economic growth. These ideas include the Dutch disease, lower quality institutions, not investing enough in people, and slower financial development. The literature supports these ideas to varying degrees.

The idea behind the link between natural resource rent and economic growth is that it can be either good or negative, based on how natural resource rent affects economic growth. Institutional quality, financial growth, the efficiency of the government, and Foreign Direct Investment (FDI) are some of the things that can make it easier to get and use natural resources for production (Adabor, 2022; Nasani et al., 2021; Rafei et al., 2022). On the other hand, bad things like bad government, war, damage to the environment, and high prices for resources can stop them from being used and slow down economic growth (Paine, 2016; Fawole et al., 2016).

Ajide (2022) and Avom et al. (2022) are two recent studies that looked into the cause-and-effect link between resources and economic complexity. They found that resources have a bad effect on economic complexity, especially in developing countries. Mesagan and Vo (2023) and Tabash et al. (2022) look into the effect of resources on economic growth in more detail, focused on how economic complexity acts as a buffer. They discover that resources don't have much of an impact on economic growth or even hurt it. On the other hand, they find that economic complexity has a good long-term effect on growth, even though it might have negative short-term effects. Based on these results, it looks like short-term economic growth might need to be given up in order to ensure long-term success.

The connection between economic development and natural resources is complex (Ofori & Grechyna, 2021). The impact of natural resources on growth has been the subject of debate in recent decades. Some studies have found that resources hinder growth (Gerelmaa & Kotani, 2016; Aslan & Altinoz, 2021), while others contend that natural resources actually promote economic growth (Gerelmaa & Kotani, 2016). But these ideas keep popping up in conversations about depleting natural resources and bad economic development. Furthermore, economic progress might be hindered by natural resource shortage (Uri, 1996).

Many solutions have been suggested by academics to combat the resource curse. Among these, there are measures to be taken to address currency appreciation (Alssadek & Benhin, 2023), diversification (Ajide, 2022; Avom et al., 2022; Mesagan & Vo, 2023; Yalta & Yalta, 2021), attracting Foreign Direct Investment (FDI) in the manufacturing sector (Alssadek & Benhin, 2023), financial system development (Ajide, 2022; Avom et al., 2022), institutional improvement (Havranek et al., 2016), and industrial policy support for manufacturing activities (Alssadek & Benhin, 2023). The article focuses on manufacturing and argues that targeted Foreign Direct Investment (FDI) and focused industrial policy are powerful weapons in the fight against the resource curse.

According to studies conducted by Asiedu and Lien (2011), emerging nations with an abundance of natural resources tend to attract less foreign direct investment. Foreign Direct Investment (FDI) in BRICS countries is impacted adversely

by the proportion of exports that consist of minerals and hydrocarbons, according to [Jadhav \(2012\)](#). Foreign Direct Investment (FDI) is negatively correlated with national resources in Sub-Saharan African nations, according to [Okafor, Piesse, and Webster \(2015\)](#), oil rents discourage Foreign Direct Investment (FDI) in nations with enough of the resource, according to research by [Carril-Caccia et al. \(2019\)](#). On the other hand, [Asiedu \(2006\)](#) found that fuel and mineral exports had a positive impact on Foreign Direct Investment (FDI) in Africa, while [Teixeira et al. \(2017\)](#) found that non-renewable energy resources positively influenced FDI in 125 countries.

[Adams et al. \(2019\)](#), [Amiri et al. \(2019\)](#), and [Qiang and Jian \(2020\)](#) are just a few of the many research that look at how financial development and high-quality institutions may help reduce the detrimental impact of rent from natural resources on economic growth. Previous research by [Shao and Yang \(2014\)](#), [Adika \(2020\)](#), and [Xie and Zhai \(2020\)](#) among others has shown how accountability, human capital, politics, and remittances may improve the exploitation of natural resources, thereby promoting economic development. In their political economy model, [Robinson et al. \(2006\)](#) showed that the degree to which public sector officials are influenced by special interests greatly affects how a “resource boom” is interpreted and implemented. A resource curse is more common in nations with poor institutional frameworks. Particularly in nations with low levels of actual saving, [Atkinson and Hamilton \(2003\)](#) demonstrate that an abundance of natural resources may have a detrimental impact on development if ineffective institutions let the government to spend resource revenues on consumption rather than investment.

While some studies have shown that improved political institutions may boost financial growth ([Girma & Shortland, 2008](#); [Huang, 2010](#)), others have shown the opposite ([Bhattacharyya, 2013](#)). Institutions, according to researchers like [Mehlum et al. \(2006b\)](#) and [Mavrotas et al. \(2011\)](#), are the deciding factor in whether resource income bring a blessing or a burden. Natural resource endowments may have a detrimental impact on growth, although a strong institutional framework can mitigate this, according to [Torvik \(2009\)](#) and [Sarmidi et al. \(2014\)](#).

The research suggests that the impacts of natural resource availability on FDI and institutional quality may be conditional on the index of institutional quality characteristics and the adequacy of host nations’ policies to attract FDI. Building on these earlier works, the present research adds to the growing body of work on the resource curse. Looking at the paradox of resource curse to blessing in EAC via the lenses of Foreign Direct Investment (FDI) and regulatory quality as they relate to or interact with natural resources is how we approach this topic.

### 2.3. Theoretical Framework

This study uses the detailed analytical framework created by [Ludovic and Bertelet \(2020\)](#) to examine the complex ways in which Foreign Direct Investment (FDI) and regulatory quality interact with natural resources to impact economic growth.

For resource-rich countries in the East African Community (EAC) like Burundi, Kenya, Rwanda, the Democratic Republic of the Congo, Tanzania, and Uganda—understanding how FDI, regulatory systems, and natural resource usage relate is crucial for turning the resource curse into a resource blessing.

To start, FDI is vital for boosting the efficiency and sustainability of natural resource extraction. By bringing in advanced technology and management skills, foreign investors can streamline production processes, leading to better resource management. For example, multinational companies often apply the best practices that not only enhance extraction yields but also lessen environmental harm. This cooperation is especially essential in the EAC, where traditional extraction methods can result in unsustainable practices. Additionally, FDI can supply the capital needed to invest in infrastructure, which is key to accessing and managing natural resources more effectively. So, when FDI is aligned with natural resource development, it can result in significant positive economic impacts.

Next, the effectiveness of regulatory frameworks plays a crucial role in creating an environment conducive to FDI. Countries with strong regulatory systems that prioritize transparency, accountability, and efficiency tend to attract foreign investment. Good regulations not only protect the interests of investors but also ensure that the benefits of natural resource exploitation are fairly shared among all stakeholders. In the context of the EAC, solid regulatory quality is essential for building investor trust and encouraging long-term investments. Measures like environmental assessments and anti-corruption strategies can help reduce the risks associated with resource extraction, positively affecting FDI inflows.

Moreover, the relationship between FDI and regulatory quality creates a feedback loop that supports economic growth. Quality governance improves the management of natural resources, ensuring that the wealth generated from these resources leads to sustainable development. At the same time, as FDI increases, it can motivate governments to enhance their regulatory frameworks to keep foreign investments. This dynamic not only underscores the significance of governance in the economic growth story but also suggests that better regulations can attract more FDI, which in turn can produce greater economic returns from natural resource utilization.

Studies have shown that countries with effective governance structures tend to draw more FDI, which is linked to improved economic performance (Samarasinghe, 2018). The EAC's ongoing initiatives to streamline border processes, strengthen investor protection laws, and combat corruption are steps toward creating a favorable investment climate. These actions not only attract foreign capital but also optimize how natural resources are used. Therefore, the interaction between these factors indicates that creating a coherent regulatory environment while encouraging FDI can significantly lessen the negative effects typically associated with the resource curse.

In summary, this theoretical framework clarifies the crucial pathways through which FDI and regulatory quality can interact with natural resources to influence

economic growth in the EAC. By shedding light on how these elements are interconnected, this research enhances our understanding of how targeted policy actions can maximize the potential of natural resources for sustainable development, effectively turning the resource curse into an opportunity for growth. Engaging more deeply with these theoretical concepts not only adds to the existing literature but also offers important insights for policymakers looking to manage their countries' resource wealth in a productive and sustainable way.

### 3. Data and Methodology

#### 3.1. Data

This research employs yearly panel data from East African Community (EAC) nations, including Burundi, the Democratic Republic of the Congo, Kenya, Rwanda, Uganda, and Tanzania. The selection of these nations is predicated on the availability of data spanning from 1996 to 2022. The data are from the World Bank's World Development Indicators (WDI) and Worldwide Governance Indicators (WGI). Additional information is shown in **Table 1**. Our dependent variable is GDP growth (annual %). The independent variables include natural resources, regulatory quality, and Foreign Direct Investment (FDI). To account for other influencing factors, we include trade openness as a control variable.

The anticipated impact of natural resources on economic development is unclear. High natural resource endowments can promote economic development by supplying capital for investment and infrastructure (Haseeb et al., 2021; Hayat & Tahir, 2021; Sharma et al., 2021; Chopra et al., 2022; Ramzan et al., 2022; Shahzad et al., 2022; Tahir et al., 2022; Zhao et al., 2022). Conversely, they may precipitate the resource curse, whereby resource abundance engenders diminished economic development attributable to problems including inadequate governance and economic instability (Dogan et al., 2020a, 2020b). We expect to validate the resource curse in our analysis, indicating that in the EAC, natural riches may not consistently lead to economic development.

Trade openness is a significant determinant, with both positive and negative consequences. When exports surpass imports, the nation will amass foreign reserves, so bolstering economic stability and prosperity. Multiple studies underscore the beneficial growth impacts of trade liberalization (Chang et al., 2009; Dollar & Kraay, 2004; Frankel & Romer, 1999; Freund & Bolaky, 2008). Nevertheless, if imports exceed exports, trade openness may result in trade imbalances, possibly undermining the economy. Certain research contests the favorable correlation between trade and economic development (Musila & Yiheyis, 2015; Polat et al., 2015; Ulaşan, 2015; Vlastou, 2010).

Concerning two variables of interest, regulatory quality and Foreign Direct Investment (FDI), these factors represent the institutional framework and investment milieu. A superior regulatory quality score signifies enhanced governance, marked by openness, efficiency, and less corruption (Kaufmann, Kraay, & Mastro-riilo, 2010). Regulatory quality is a crucial factor influencing FDI inflows, since

conducive regulatory regimes often draw increased levels of FDI (Contractor et al., 2020).

Foreign Direct Investment is anticipated to favorably influence economic development by introducing money, technology, and knowledge, so augmenting productivity and competitiveness. Foreign Direct Investment (FDI) stimulates economic growth by increasing domestic capital, enabling technology transfer, and improving human capital development (Aghasafari et al., 2021; Dogan et al., 2023; Esmaeili et al., 2023; Feng et al., 2023). The real effect of FDI may differ based on the legal framework and the absorptive ability of the host nation.

**Table 1.** Description of the data.

Variables	Description	Source	Definition
GDP	GDP growth (annual %)	WDI	GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products (WDI).
Natural resources	Total natural resources rents (% of GDP)	WDI	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents (WDI).
Trade openness	Trade (% of GDP)	WDI	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product (WDI).
Regulatory quality	Regulatory quality: percentile rank	WGI	Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development (WGI).
FDI	Foreign direct investment, net inflows (% of GDP)	WDI	Foreign Direct Investment (FDI) refers to the net inflows of investment aimed at acquiring a lasting management interest (10% or more of voting stock) in a foreign enterprise. It includes equity capital, reinvestment of earnings, and long- and short-term capital, as recorded in the balance of payments. FDI is expressed as a percentage of GDP, reflecting new investment inflows minus disinvestment, according to the World Development Indicators (WDI).

### Variable Description

#### Dependent Variable: GDP Growth

The dependent variable, GDP growth (annual %), measures the year-on-year change in a country's gross domestic product, reflecting the overall economic performance of the nation. GDP growth is widely recognized as a reliable indicator of economic health and development (World Bank, 2024).

#### Independent Variables:

**Natural Resources:** This variable encompasses the value of economically exploitable natural resources, such as minerals, oil, and gas. Their impact on growth is uncertain; while they can provide a critical source of investment, they may also foster dependency and economic volatility if not managed effectively (Dogan et al., 2020a).

**Regulatory Quality:** This indicator measures the efficiency and credibility of a country's regulatory framework in facilitating economic activities. A higher regulatory quality score suggests better governance, reduced corruption, and more effective policies conducive to growth (Kaufmann, Kraay, & Mastrorillo, 2010). Regulatory quality is essential for attracting FDI and enhancing the investment climate.

**Foreign Direct Investment (FDI):** FDI denotes investment made by foreign entities in domestic firms, characterized by the transfer of capital, technology, and expertise. Increased FDI is anticipated to enhance productivity and competitiveness by injecting external capital into the economy (Aghasafari et al., 2021; Dogan et al., 2023).

#### **Control Variables:**

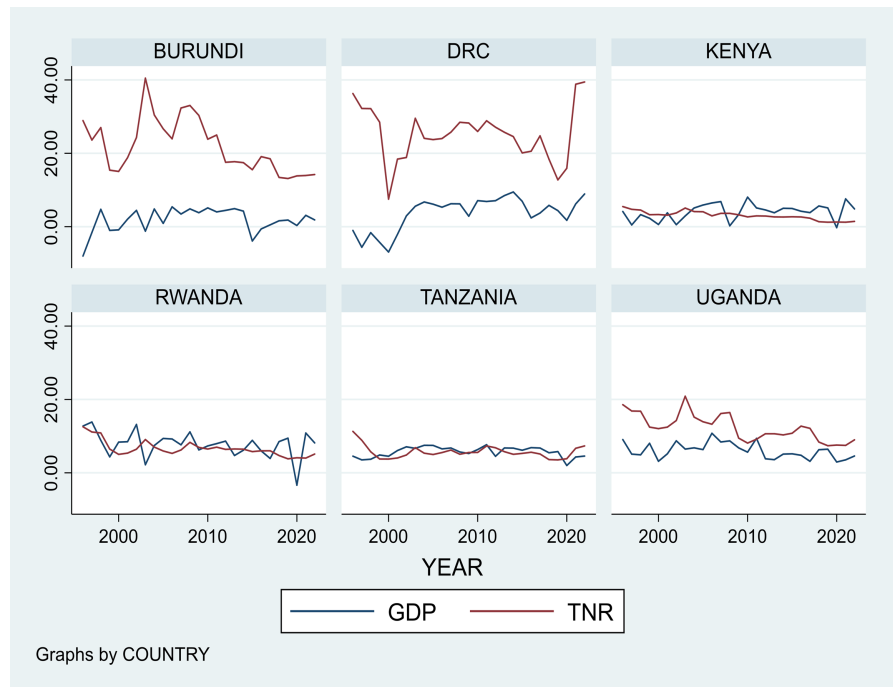
**Trade Openness:** This variable is measured as the sum of a country's exports and imports relative to GDP, reflecting the extent to which an economy engages in trade. Trade openness is crucial for economic integration, allowing countries to capitalize on comparative advantages and achieve higher growth (Freund & Bolaky, 2008).

The choice of using lagged variables in our study is based on the necessity to accurately capture the temporal dynamics of economic processes and to address potential endogeneity issues. Lagged variables enable the modeling of delayed effects of independent variables on the dependent variable, which is essential in dynamic econometric analysis. This approach helps mitigate biases that often arise from simultaneity, wherein the dependent variable can influence the independent variables over time. For instance, scholars such as Arellano and Bover (1995) have effectively utilized lagged variables in their work on dynamic panel data, demonstrating that inclusion of such variables enhances the robustness of estimations by accounting for previous outcomes that could affect current measurements. Similarly, Blundell and Bond (1998) emphasized the importance of incorporating lagged dependent variables to improve the consistency and efficiency of estimates in their studies, particularly when dealing with persistence in economic data.

Moreover, the reliance on data from the World Bank, particularly the World Development Indicators (WDI) and Worldwide Governance Indicators (WGI), is well-founded due to their credibility and rigorous collection methodologies. The World Bank databases are broadly accepted in academic research for providing comprehensive and systematically collected data across various countries, including the nations within the East African Community (EAC). Kaufmann, Kraay, and Mastruzzi (2009) noted the methodological strength of the WGI, which effectively captures various dimensions of governance. Additionally, the research by Dreher et al., 2010a, 2010b) underscores the reliability of World Bank data in exploring relationships between governance and economic outcomes. While there are concerns regarding perception-based indicators, such as regulatory quality, the methodological framework of the World Bank remains a valuable asset for economists seeking to draw meaningful insights from empirical studies.

### 3.2. GDP Growth versus Natural Resources Trend in EAC Countries (1996-2022)

From **Figure 1**, we observe that in Burundi, the significant fluctuations, with a peak around 2005 followed by a sharp decline, suggest instability in resource management or external market influences. This volatility indicates challenges in leveraging natural resources for sustained economic benefit. There is a stable trend with a slight upward trajectory until 2010, followed by a decline, which suggests that economic growth is not strongly linked to natural resource exploitation. This disconnect may highlight issues in translating resource wealth into broader economic development (**Figure 1**).



**Figure 1.** The trend of natural resources and economic growth (1996-2022): Republic of Burundi, the Democratic Republic of the Congo, the Republic of Kenya, the Republic of Rwanda, the Republic of Uganda, and the United Republic of Tanzania.

In DRC, the decline from around 2000 to 2010, followed by a slight recovery, reflects potential challenges in resource extraction or market conditions. This trend suggests that natural resources have not consistently contributed to economic growth. There is a relatively stable GDP trend, despite fluctuations in natural resources, which indicates that the economy might be benefiting from diversification or other sectors. This stability suggests a resilience to resource volatility.

In Kenya, the relatively stable trend with minor fluctuations indicates a balanced approach to resource management, suggesting that natural resources are not a major driver of economic volatility. There is a stable and slightly upward trend throughout the period, which reflects a diversified economy that is not heavily reliant on natural resources. Various economic sectors support this consistent growth pattern,

indicating stability.

In Rwanda, the stable trend with minor fluctuations suggests effective management of natural resources, indicating that they are not a primary source of economic instability. We observe the consistent upward trend in GDP reflects a diversified economy with stable growth, suggesting that economic development is supported by multiple sectors beyond natural resources.

In Tanzania, the stable trend with minor fluctuations indicates that natural resources are managed in a way that does not significantly impact economic stability. There is a stable and slightly upward trend suggesting a diversified economy with consistent growth, indicating that economic development is not heavily dependent on natural resources.

In Uganda, the stable trend with minor fluctuations suggests that natural resources are not a major source of economic volatility, indicating effective management. The consistent upward trend in GDP reflects a diversified economy with stable growth, suggesting that economic development is supported by various sectors beyond natural resources.

Overall, countries like Burundi and the DRC have experienced significant fluctuations in natural resources, which have had varying impacts on their GDP. Burundi's economy appears more volatile, with natural resource peaks not translating into sustained economic growth, possibly due to mismanagement or external factors. In contrast, the DRC's GDP remains relatively stable despite declines in natural resources, indicating potential diversification or resilience in other economic sectors.

Countries like Kenya, Rwanda, Tanzania, and Uganda exhibit relatively stable trends in both natural resources and GDP, indicating diversified economies that are not heavily dependent on natural resources. The minor fluctuations in natural resources do not significantly impact GDP, suggesting that these countries have developed robust economic structures that support consistent growth across various sectors.

### 3.3. Econometric Models

To attain our aim, we analyzed the correlation between economic development and natural resources. A nation may capitalize on its natural resources by strategically reinvesting revenues into productive sectors, thereby enhancing economic output. However, if managed poorly, these resources can lead to the resource curse—a scenario where resource wealth fails to contribute positively to economic development. This paper focuses on three key strategies: utilizing Foreign Direct Investment (FDI), enhancing regulatory quality, and understanding their combined effect to mitigate the adverse impacts of the resource curse.

The reinvestment of natural resource revenues can be outlined by the following equations:

$$I_{it} = \delta R_{it} \quad (1)$$

where  $I_{it}$  represents investment from natural resource revenue for country  $i$  at time  $t$ ;  $R_{it}$  signifies total resource revenue, and  $\delta$  denotes the proportion reinvested.

This investment can increase the capital stock:

$$K'_{it} = K_{it} + I_{it} = K_{it} + \Delta R_{it} \tag{2}$$

where  $K'_{it}$  is the new capital stock. This model emphasizes that optimal reinvestment can lead to increased production capacity, supporting economic growth.

Resource dependency may cause economic volatility, negatively impacting growth:

$$V_{it} = \theta N_{it} \tag{3}$$

where  $V_{it}$  is economic volatility,  $\theta$  is the sensitivity factor, and  $N_{it}$  is natural resource endowment.

The output diminishes in response to this volatility:

$$Y''_{it} = Y'_{it} - \beta V_{it} \tag{4}$$

where  $Y''_{it}$  represents adjusted output, with  $\beta$  reflecting the impact of volatility on growth.

To counteract the effects of the resource curse, governments must adopt specific strategies.

To bolster investments in natural resources, countries may encourage FDI:

$$FDI_{it} = \gamma_1 NAT_{it} + \gamma_2 REG_{it} \tag{5}$$

where  $FDI_{it}$  denotes foreign direct investment for country  $i$  at time  $t$ .

$REG_{it}$  refers to the regulatory quality,  $\gamma_1$  and  $\gamma_2$  are coefficients indicating responsiveness to resource endowment and governance quality.

Here, FDI not only presents new capital but also modern technology and expertise, facilitating better resource management.

Regulatory quality plays a critical role in shaping how resource revenues contribute to economic development:

$$REG_{it} = \delta_1 G_{it} + \delta_2 T_{it} \tag{6}$$

where  $REG_{it}$  stands for regulatory quality, and  $G_{it}$  denotes governance indicators while  $T_{it}$  represents technical efficiency measures. The coefficients  $\delta_1, \delta_2$  signify the influence of governance and technology on regulatory quality.

Improving regulatory frameworks can minimize corruption and inefficiencies, ensuring revenue is utilized effectively.

The overall economic growth model that incorporates FDI, regulatory quality, and resource endowment is represented as:

$$\begin{aligned} \Delta GDP_{it} = & \alpha + \beta_1 NAT_{it} + \beta_2 REG_{it} + \beta_3 FDI_{it} + \beta_4 (FDI_{it} * NAT_{it}) \\ & + \beta_5 (REG_{it} * NAT_{it}) + \varnothing_i + \rho \Delta GDP_{it-1} + \varepsilon_{it} \end{aligned} \tag{7}$$

where  $\Delta GDP_{it}$  signifies the growth rate of GDP; the various  $\beta$  coefficients capture the relationships between natural resources, regulatory quality, and

FDI.

This comprehensive model illustrates that the strategic integration of FDI and enhanced regulatory quality can mitigate the resource curse, ensuring that natural resources are utilized to fuel economic development rather than hindering it.

### 3.4. Estimation Strategy

To fulfill the dual aims of this study, we utilize a systematic estimation approach. Initially, we employ the Ordinary Least Squares (OLS) estimator to analyze the influence of natural resources, regulatory quality, and foreign direct investment on economic growth within the EAC. Prior to this analysis, we assess the stationarity of the variables using the Augmented Dickey-Fuller (ADF) unit root tests, ensuring that all variables are appropriately integrated to address issues of spurious regression.

Next, we evaluate the relationship between the variables to confirm the absence of multicollinearity, which could distort our estimations. To address potential endogeneity concerns, we apply a two-Stage Least Squares (2SLS) estimation technique. This advanced methodology allows us to validate the findings from OLS estimations and provides reliable results by addressing simultaneous causality.

Moreover, we will implement various alternative methodologies to ensure the robustness of findings, including the Fixed Effects estimator that integrates year effects without assuming an AR(1) process and the Generalized Method of Moments (GMM) approach, providing a valid alternative model. These methodologies will help affirm the consistency and dependability of our results across different estimation techniques.

In summary, we will first analyze the relationships between the dependent and independent variables to elucidate direct influences. Following that, we will incorporate explanatory variables to understand their effects on economic growth and assess their potential to mitigate the resource curse. By including additional control variables, we will further investigate their impact on the model. Lastly, we will explore interaction terms to examine how the synergies between natural resources, foreign direct investment, and regulatory quality can influence the economic outcomes, enabling us to transform the resource curse from the initial model into a source of economic development benefits.

## 4. Empirical Results and Discussion

**Table 2** and **Table 3** show the regression results for our baseline models, which use both the Ordinary Least Squares (OLS) and two-Stage Least Squares (2SLS) estimators. These models look at the influence of natural resources on economic development in the East African Community (EAC) nations. The first model focuses on natural resources, while the second model emphasizes Foreign Direct Investment (FDI) and regulatory quality as explanatory factors. The third model

adds trade openness as a control variable, and the fourth model and the fifth model contain the interaction terms that are crucial to our analysis. The empirical data show a negative and statistically significant influence of total natural resources on GDP growth in the first, second, and third models. All three models in the EAC area show a 0.11% drop in economic growth for every 1% increase in natural resources. This finding supports the prevalence of the “resource curse”, which suggests that relying only on natural resources may stifle economic progress. These findings align with those of [Ofori and Grechyna \(2021\)](#) and previous studies that highlight the detrimental impact of natural resources on economic development ([Gerelmaa & Kotani, 2016](#); [Aslan & Altinoz, 2021](#)). The study also shows that regulatory quality has a positive and statistically significant influence on GDP growth in both OLS and 2SLS estimates. Economic growth rises by 0.41% with a 1% improvement in regulatory quality, underscoring the importance of good governance and regulatory frameworks in enhancing EAC. [Jalilian et al. \(2007\)](#) confirm this conclusion, highlighting the crucial role of regulation in achieving social welfare objectives and enhancing economic efficiency. The findings also show that FDI has a positive and statistically significant influence on GDP growth in both estimates. A 1% increase in FDI equates to a 0.47% increase in GDP growth, demonstrating the importance of foreign investment in EAC nations’ economic development. FDI provides cash, technology, and knowledge, allowing for economic diversification and lowering dependency on natural resources. This result is consistent with the findings of [Nketiah-Amponsah and Sarpong \(2019\)](#), [Katerina et al. \(2004\)](#), [Jugurnath et al. \(2016\)](#), and [Joshua et al. \(2021\)](#), all of whom have shown that foreign direct investment boosts economic development. The study also shows that trade openness has a positive and statistically significant influence on GDP growth in both OLS and 2SLS estimates. A 1% increase in trade openness correlates with a 0.03% improvement in economic growth. This implies that international commerce may greatly enhance economic development in EAC nations by opening up new markets, diversifying economies, and lowering reliance on natural resources. These findings are consistent with research by [Malefane and Camarero \(2020\)](#), [Keho \(2017\)](#), and [Victor \(2019\)](#), which all suggest that trade openness boosts economic development. In the fourth model, the interplay of Foreign Direct Investment (FDI) and natural resources has a positive and statistically significant influence on GDP growth in EAC member nations. This transition implies that FDI may successfully turn the resource curse into a gift by providing the cash, modern technology, and management knowledge required for optimum resource usage. FDI increases the productivity of resource industries by bringing contemporary extraction methods and sustainable practices, resulting in higher production and lower environmental impact. Furthermore, FDI promotes skill and knowledge transfer to the local workforce, allowing them to better manage and use resources. This skill development is critical to establishing a strong and competitive economy. FDI also promotes economic diversification by boosting

development in allied industries such as manufacturing, services, and infrastructure, decreasing dependence on raw material exports. When regulatory quality interacts with natural resources, their impact on GDP growth is positive and statistically significant in both estimators. This suggests that by ensuring efficient and sustainable management and use of natural resources, excellent governance and appropriate legislation can transform the resource curse into a blessing. Strong regulatory frameworks promote openness, accountability, and efficiency in the resource sector, resulting in better economic results. Effective laws reduce the hazards associated with resource exploitation, such as environmental degradation and social conflict, by enforcing standards and best practices. They also assure revenue. Effective laws ensure that natural resource earnings finance public goods and services like education, healthcare, and infrastructure, all essential for long-term economic growth. Furthermore, effective governance may increase Foreign Direct Investment (FDI) by fostering a stable and predictable economic climate. Investors are more inclined to devote resources to nations that uphold the rule of law and safeguard property rights. This, in turn, may result in higher capital inflows, technological transfer, and talent development, thus increasing the economic advantages of natural resources. When EAC nations concentrate on enhancing regulatory quality, they may considerably improve their capacity to manage natural resources efficiently. This entails improving institutions, decreasing corruption, and enacting laws that encourage openness and accountability. By doing so, these nations can guarantee that natural resources support long-term economic growth and development.

To summarize, the dynamics influencing economic growth in the East African Community (EAC) nations reveal a fascinating interplay between Foreign Direct Investment (FDI), regulatory quality, and natural resources. Initially, the analysis demonstrates a disheartening relationship wherein natural resources adversely affected GDP development, as evidenced by the negative impacts observed in models 1, 2, and 3. This phenomenon is often referred to as the “resource curse”, wherein an abundance of natural resources correlates with economic challenges such as mismanagement, poor governance, and corruption. Without effective management, countries may experience a lack of economic diversification and inherent instability, which hinders sustainable growth. However, the introduction of interaction terms in models 4 and 5 transforms this narrative significantly. When natural resources are considered in conjunction with FDI or high regulatory quality, the previously negative impact on GDP shifts towards a positive trajectory. This change suggests that strategic resource management can indeed turn the resource curse into a blessing. In this context, the interaction terms serve as a powerful mechanism, demonstrating that the correct alignment of foreign investment with strong regulatory frameworks can elevate the effects of natural resources on economic growth from detrimental to advantageous.

The empirical results reinforce the notion that prioritizing high-quality FDI can facilitate this transition, bringing along essential capital, advanced technology, and managerial expertise vital for the sustainable management of natural resources. These elements are crucial not only for optimizing the exploitation of resources but also for enhancing productivity and amplifying GDP growth. Likewise, the establishment of robust regulatory mechanisms directly contributes to ensuring transparency and sustainable practices in resource management. Effective laws can mitigate the adverse effects associated with resource exploitation, including

**Table 2.** Baseline regression analysis: OLS.

Dependent variable: Economic growth					
	(1)	(2)	(3)	(4)	(5)
	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)
Variables					
TNR	-0.1000*** (0.025)	-0.058*** (0.033)	-0.074*** (0.033)	0.150* (0.026)	0.112* (0.025)
REG		0.0419*** (0.018)	0.038*** (0.018)	0.036*** (0.021)	0.013*** (0.033)
FDI		0.478*** (0.108)	0.388*** (0.117)	0.204** (0.285)	0.182** (0.2221)
TRAD			0.033** (0.017)	0.023** (0.009)	0.018** (0.0008)
FDI * TNR				0.023*** (0.004)	
REG * TNR					0.004*** (0.001)
Country effect	YES	YES	YES	YES	YES
Year effect	YES	YES	YES	YES	YES
Cons	3.044*** (0.408)	3.602*** (0.871)	3.667*** (0.991)	2.994*** (0.384)	2.197*** (0.479)
N observations	162	162	162	162	162
R squared	0.17	0.23	0.25	0.19	0.13

Note: Standard errors in parentheses. Abbreviations: OLS: Ordinary Least Squares; TNR: Natural resources; REG: Lagged regulatory quality; FDI: Lagged foreign direct investment; TRAD: Trade openness; REG \* TNR: Interaction term between natural resources and foreign direct investment; FDI \* TNR: Interaction term between foreign direct investment and natural resources. The dependent variable is GDP growth (annual %). The study covers the sample period 1996-2022. Source: Author's estimation results. \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ .

**Table 3.** Additional testing (2 SLS regression analysis).

Dependent variable: Economic growth					
	(1)	(2)	(3)	(4)	(5)
	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)
Variables					
TNR	-0.111*** (0.022)	-0.087*** (0.030)	-0.096*** (0.031)	0.156* (0.024)	0.118* (0.022)
REG		0.026*** (0.016)	0.025*** (0.016)	0.017*** (0.012)	0.015*** (0.008)
FDI		0.433*** (0.103)	0.390*** (0.108)	0.288** (0.101)	0.198** (0.121)
TRAD			0.020** (0.016)	0.017** (0.014)	0.015** (0.010)
FDI * TNR				0.019*** (0.004)	
REG * TNR					0.003*** (0.001)
Country effect	YES	YES	YES	YES	YES
Year effect	YES	YES	YES	YES	YES
Cons	1.22*** (1.163)	0.162*** (1.32)	0.777*** (1.396)	1.827*** (1.112)	0.378*** (1.165)
N observations	162	162	162	162	162
R squared	0.35	0.43	0.43	0.41	0.38

Note: Standard errors in parentheses. Abbreviations: 2SLS: Two-Stage Least Squares; TNR: Natural resources; REG: Regulatory quality; FDI: Foreign Direct Investment (lagged FDI and lagged regulatory quality are used as instrument variables); TRAD: Trade openness; Lagged REG \* TNR: Interaction term between natural resources and lagged regulatory quality; Lagged FDI \* TNR: Interaction term between lagged foreign direct investment and natural resources. The dependent variable is GDP Growth (annual %). The study covers the sample period from 1996 to 2022. Source: Author's estimation results. \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ .

environmental degradation and social unrest, through the implementation of standards and the promotion of best practices. Furthermore, EAC countries may benefit significantly from international partnerships and regional collaboration, enabling knowledge exchange and capacity-building initiatives that can enhance both regulatory frameworks and resource management strategies. By strategically leveraging FDI and enhancing regulatory quality, EAC nations stand at a pivotal juncture where they can convert their natural resources from potential liabilities into catalysts for long-term economic growth and development, effectively transforming challenges into significant opportunities.

The shift from a resource curse to a resource blessing is not merely theoretical; it encapsulates the potential for sustainable economic advancement in the region,

reflecting a profound understanding of how economic policies can harness inherent advantages for wider societal gain. This compelling interplay underscores the transformative power of interaction terms in econometric models, whereby integrating foreign direct investment and regulatory quality with natural resources can pivotally alter the economic landscape, driving growth and prosperity in the EAC nations. As these countries embrace a comprehensive approach that prioritizes both FDI and high-quality regulatory standards, they may indeed realize their full economic potential, turning their resource wealth into a vehicle for prosperity rather than a source of stagnation.

**Table 4** and **Table 5** offer alternative results employing Fixed Effects (FE) without AR(1) and Generalized Methods of Moments (GMM) as models for robustness testing, thereby corroborating the findings derived from OLS and 2SLS, in alignment with foundational studies such as those by [Anderson and Hsiao \(1981\)](#), [Arellano and Bond \(1991\)](#), [Judson and Owen \(1999\)](#), and [Roodman \(2009\)](#). The robustness checks were rigorously implemented to ascertain the reliability and consistency of our findings. Our examination indicates that the adverse and statistically significant impact of total natural resources on GDP growth remains evident across all models, thereby reinforcing the notion of the resource curse within the East African Community (EAC) nations, in alignment with the conclusions drawn by [Auty \(1993\)](#), [Ross \(1999\)](#), and [Sala-i-Martin and Subramanian \(2008\)](#). This indicates that an excessive dependence on natural resources may lead to economic difficulties, including fluctuations in commodity prices, governance challenges, and a lack of economic diversification. For the EAC countries, this highlights the pressing necessity to develop policies aimed at diminishing reliance on natural resources while encouraging investment in alternative sectors, such as manufacturing and services, to cultivate a more robust and varied economic foundation. Through this approach, these nations can alleviate the dangers linked to resource dependency and foster stable, enduring economic advancement. Nonetheless, the incorporation of explanatory variables like regulatory quality and Foreign Direct Investment (FDI) demonstrates positive and statistically significant effects on GDP growth, highlighting their crucial contributions to improving economic performance. In the context of the EAC nations, the elevation of regulatory standards has the potential to foster superior resource management, bolster transparency, and mitigate corruption. This, in turn, could draw in greater investment and guarantee that the proceeds from natural resources are judiciously allocated towards public goods and services—such as infrastructure, education, and healthcare—that are essential for sustainable development. This discovery is consistent with the studies conducted by [Acemoglu et al. \(2001\)](#), [Kaufmann and Kraay \(2002\)](#), [Han et al. \(2014\)](#), [Mira and Hammadache \(2017\)](#), and [Samarasinghe \(2018\)](#). The favorable influence of foreign direct investment on GDP growth indicates that such investments play a crucial role in the economic advancement of EAC nations, supporting the conclusions drawn by [Brahim and Rachdi \(2014\)](#), [Jude and Leveigue \(2015\)](#), and [Trojette \(2016\)](#). In the context of the EAC nations,

the enhancement of foreign direct investment stands to serve as a significant impetus for the generation of employment opportunities, the advancement of skill sets, and the enhancement of infrastructure, ultimately contributing to the promotion of enduring economic development. Foreign Direct Investment presents a significant avenue for these nations to assimilate into global value chains, thereby augmenting their competitiveness and fostering innovation. Through the strategic utilization of foreign direct investment, the nations of the East African Community can cultivate a more vibrant and varied economic landscape. Moreover, the

**Table 4.** Robustness check: FE without AR(1).

Variables	Dependent variable: Economic growth				
	(1)	(2)	(3)	(4)	(5)
	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)
TNR	-0.007*** (0.041)	-0.069*** (0.046)	-0.015*** (0.049)	0.028* (0.045)	0.001* (0.052)
REG		0.0098*** (0.024)	0.017*** (0.026)	0.020*** (0.032)	0.021*** (0.027)
FDI		0.509*** (0.119)	0.345*** (0.131)	0.323** (0.115)	0.289** (0.109)
TRAD			0.065** (0.023)	0.048** (0.013)	0.032** (0.017)
FDI * TNR				0.024*** (0.005)	
REG * TNR					0.004*** (0.002)
Country effect	YES	YES	YES	YES	YES
Year effect	YES	YES	YES	YES	YES
Cons	1.88*** (0.823)	0.483*** (0.964)	1.479*** (1.010)	0.730*** (0.612)	0.627*** (0.684)
N observations	162	162	162	162	162
R squared	0.47	0.12	0.16	0.12	0.17

Note: Standard errors in parentheses. Abbreviations: (FE) without AR(1): Fixed effects; TNR: Natural resources; REG: Regulatory quality; FDI: Foreign Direct Investment; TRAD: Trade openness; REG \* TNR: Interaction term between natural resources and regulatory quality; FDI \* TNR: Interaction term between foreign direct investment and natural resources. The dependent variable is GDP Growth (annual %). In this model, we include time-invariant variables to control for unobserved heterogeneity. The study covers the sample period from 1996 to 2022. Source: Author's estimation results. \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ .

**Table 5.** Robustness check: GMM.

Dependent variable: Economic growth					
	(1)	(2)	(3)	(4)	(5)
	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)
Variables					
TNR	-0.043** (0.023)	-0.054** (0.031)	-0.063** (0.032)	0.080* (0.025)	0.044* (0.023)
Lagged REG		0.002** (0.015)	0.006** (0.015)	0.004** (0.011)	0.005** (0.009)
Lagged FDI		0.279** (0.095)	0.251*** (0.098)	0.231** (0.082)	0.189*** (0.074)
TRAD			0.014* (0.015)	0.013* (0.013)	0.011* (0.009)
Lagged FDI * TNR				0.012*** (0.004)	
Lagged REG * TNR					0.0004*** (0.001)
Country effect	YES	YES	YES	YES	YES
Year effect	YES	YES	YES	YES	YES
Cons	1.974*** (1.07)	0.148*** (1.30)	0.448*** (1.32)	0.392** (1.06)	0.115*** (1.130)
N observations	156	156	156	156	156
AR(1)	0.000	0.000	0.000	0.000	0.000
AR(2)	0.504	0.408	0.508	0.489	0.495
Sargan/Hansen test of overid	0.568	0.619	0.558	0.534	0.883

Note: Standard errors in parentheses. Abbreviations: GMM: Generalized Method of Moments; TNR: Natural resources; Lagged REG: Lagged regulatory quality; Lagged FDI: Lagged Foreign Direct Investment; TRAD: Trade openness; Lagged REG \* TNR: Interaction term between natural resources and lagged regulatory quality; Lagged FDI \* TNR: Interaction term between lagged foreign direct investment and natural resources. The dependent variable is GDP Growth (annual %). In this model, we use lagged differences of endogenous variables as instruments to address potential endogeneity. The study covers the sample period from 1996 to 2022. Source: Author's estimation results. \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ .

incorporation of trade openness as a control variable consistently demonstrates a positive and statistically significant influence on GDP growth, indicating that participation in international trade may enhance economic development. The results align with earlier research conducted by [Adeleye and Eboagu \(2019\)](#), [Abendin and Duan \(2021\)](#), and [Yusoff and Nulambeh \(2016\)](#). Through the integration into global markets, EAC nations have the potential to explore novel opportunities, enhance the diversity of their economies, and mitigate reliance on natural resources. This may result in heightened competitiveness, the availability of a wider

array of goods and services, and a deeper integration into the global economy, thereby fostering innovation and enhancing efficiency. The adoption of trade openness allows these countries to leverage economies of scale, attract international investments, and enhance their export potential. By engaging in international commerce, EAC members may foster regional cooperation and strengthen economic ties with other countries, thereby promoting overall economic stability and progress. The interaction between foreign direct investment and natural resources, along with the effect of regulatory quality on these resources, has a positive and statistically significant influence on GDP growth, transforming the resource curse into a possible benefit. The findings indicate that by strategically attracting more foreign direct investment, EAC countries can acquire essential capital, advanced technology, and managerial expertise to enhance the productivity of their resource sectors, thus increasing output and reducing environmental impacts. This relationship indicates that foreign direct investment may diversify the economy and reduce reliance on raw resource exports. Moreover, prioritizing the enhancement of regulatory standards may significantly improve the ability of EAC members to effectively manage their natural resources. This involves strengthening institutions, reducing corruption, and implementing laws that promote openness and accountability. By implementing these strategies, these countries may ensure that their natural resources significantly contribute to sustainable economic growth and development.

## 5. Conclusion

This research enriches the existing literature by presenting a comprehensive framework for understanding how African nations, particularly those within the East African Community (EAC), can capitalize on their natural resource abundance to stimulate economic growth. Despite the wealth of natural resources, many African countries continue to grapple with the resource curse, which undermines sustainable economic progress. This study critically examines the roles of regulatory quality and Foreign Direct Investment (FDI) in transforming this challenge into an opportunity for development. Employing panel data from 1996 to 2022, the research evaluates the impacts of natural resources, regulatory quality, and FDI on economic growth through bivariate relationships. The analysis utilizes pooled Ordinary Least Squares (OLS) and two-Stage Least Squares (2SLS) as foundational models, while also incorporating robust one-way Fixed Effects (FE) with exclusions of AR(1) and first-difference Generalized Method of Moments (GMM) to ensure the reliability and robustness of the results.

The findings highlight the significant transformative potential of integrating FDI and regulatory quality with natural resource management in EAC nations. By strategically leveraging these elements, EAC countries can effectively navigate the resource curse, transforming it into a catalyst for sustainable economic growth and development. Specifically, FDI is identified as a vital contributor, supplying essential capital, advanced technologies, and managerial expertise that enhance

productivity in resource sectors. This relationship fosters increased output while mitigating environmental impacts, signifying that FDI not only supports economic diversification but also reduces over-dependence on raw material exports. For EAC nations, the deliberate pursuit and strategic deployment of FDI are crucial for building essential infrastructure and establishing a stable regulatory environment that bolsters investor confidence.

Furthermore, enhancing the quality of regulatory frameworks fosters transparency, accountability, and efficiency within the resource sector, leading to improved economic benefits. Strengthened regulatory institutions can substantially enhance the capacity of EAC nations to manage their natural resources judiciously. This encompasses bolstering institutional integrity, curbing corruption, and implementing policies that encourage transparency and accountability. Such reforms ensure that the region's natural wealth translates into sustainable economic growth and development.

While this study provides valuable insights, it is crucial to acknowledge its limitations, particularly regarding the generalizability of the findings to other contexts. The specific socio-economic, political, and institutional conditions in the EAC may not be representative of other African nations or different global regions. Future research should adopt a more nuanced approach, considering contextual variations and the unique circumstances that different countries face, especially when exploring the interplay between natural resources, regulatory quality, and FDI. The insights gained from this study are intended to guide policymakers and stakeholders within the region, emphasizing the importance of creating an enabling environment conducive to investments and robust governance reforms. By doing so, EAC nations can better harness their natural resources for the purpose of broad-based, sustainable economic development.

### **Data Availability Statement**

The data that support the findings of this study are available in World Bank to data set(s)/data sources:

<https://databank.worldbank.org/source/world-development-indicators>, and

Worldwide Governance Indicators:

<https://www.worldbank.org/en/publication/worldwide-governance-indicators>.

### **Conflicts of Interest**

The authors declare no conflicts of interest regarding the publication of this paper.

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