GSJ: Volume 12, Issue 9, September 2024, Online: ISSN 2320-9186
www.globalscientificjournal.com

EFFECT OF FOREIGN DIRECT INVESTMENTS ON ECONOMIC GROWTH IN KENYA

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Abstract

The primary goal of this study was to investigate how Foreign Direct Investment (FDI) inflows affect Kenya's GDP, inflation rate, and employment rate. The research was guided by several key questions: How does FDI impact Kenya's inflation rate? What effect does FDI have on job creation in Kenya? What is the effect of FDI on Kenya's GDP? The study utilized a descriptive research design, which involved observing and assessing the participants' behavior without making any modifications. A correlational design was also employed, focusing on the relationship between variables such as FDI inflows, GDP, average inflation rates, and the labor force participation rate in Kenya. The study specifically targeted Kenya, using secondary data primarily obtained from the Kenya Bureau of Statistics. A checklist based on the research questions was used to gather data on FDI inflows, GDP, inflation rates, and labor participation rates over the period from 2010 to 2022. The collected data was presented in tables and analyzed using multiple regression in the Statistical Package for the Social Sciences (SPSS) to ensure a systematic approach to data analysis. The data was then further examined using observational methods, correlation, regression, and statistical models before being presented in tables for clarity. The findings of the study indicated a positive relationship between FDI inflows and Kenya's economic growth, showing that increased FDI is beneficial for the nation's economic development. However, the study also found a negative correlation between FDI inflows and inflation rates, suggesting that as FDI inflows increase, inflation also tends to rise. The results regarding the impact of FDI on Kenya's labor market were favorable. The study recommended that the government focus on enhancing factors that attract FDI to promote economic growth.

Keywords: Foreign Direct Investment, Inflation and Gross Domestic Product

Background of the Study

Most countries in Africa are developing countries, in the other continents in the world; the number of developing countries is not much as in Africa. This suggests that these countries' economies are experiencing poor growth, with low per capita incomes and a high tendency to consume, resulting in a low willingness to save (Grinin & Korotayev, 2023). Developing countries in the world have

some common characteristics despite their locations geographically on the map; these include the high rate of unemployment, high population growth, dependence on the primary sector, and low per capita income (Weiss, Nelson, Gibson, Temperley, Peedell, Lieber & Gething, 2018). They have low capital accumulation leading to low domestic investments because their economies are not in a position to carry on development projects, this is due because there is a higher consumption rate than the creation of national wealth. With the low domestic investment, private investors are required to enhance the rate of productivity and to improve the technological efficiencies in developing economies (Dinh, Palmade, Chandra & Cossar, 2012).

World bank 2010 defines foreign direct investment as a cross-border equity flow between countries where residents in one country control at least 10 percent of the voting stock of the operation of a business entity in another economic jurisdiction (Omondiale, 2018). A foreign investor can take a form of a company of other legal jurisdiction within Kenya, a partnership with the majority from another jurisdiction, or a natural person who is not a Kenyan citizen.

Contribution of the capital of foreign direct investment is done by multinational corporations which assist in technological production in improving tastes of products and living standards of lives in the host countries (Diyamett, Ngowi & Mutambala 2011).

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Foreign Direct Investment in Kenya

FDI in Kenya is described as an exposure to international assets like different currency, loans, rights, privileges, or properties made by a foreigner (a non-Kenyan citizen) for the production of goods that would be sold locally or shipped overseas (Sikuta, 2016).

The history of foreign firms in Kenya started from independence in 1963, as it was the most favorable country in terms of foreign investors in the whole of East Africa from independence through to 1970s 1980s. In 2008 Kenya launched vision 2030 intending to achieve global competitiveness for FDI among other things including economic prosperity. This initiative has assured a renewed commitment to attract foreign direct investment to help in achieving higher economic growth rates (Maekawa, 2015).

The period between 1970 to 1980 in Kenya saw good infrastructures, relatively high level of development, market size, relative political stability, and favorable security leading to the growth of FDI at that time while other countries in the region had relatively closed regimes and they all contributed to multinational companies (MNC) choosing Kenya as their regional hub (Kimenyi, Mwega & Ndung'u, 2015).

FDI peaked at around 60 million US dollars in the 1980s from 10 million US dollars a year in the early 1970s. The expansion of the agricultural sector, expansionary fiscal and monetary policies, a sustainable budget deficit, and the import substitution industrialization (ISI) plan all contributed to a reasonably high capital influx. Overvalued exchange rates, import duties, quantitative limits, and import licensing all resulted as a result of this.

Following the 1980s, Kenya's economic performance deteriorated due to corruption and inadequate administration, resulting in a low level of FDI influx. FDI inflow dropped to an average of 22 million US dollars per annum between the period of 1981 to 1999, even though it dropped, Kenya was at better position compared to the other countries in East Africa, this can be proved by analyzing the stock of FDI which was 7.5% of the GDP in 2003 with 25.3% for Africa as a whole (Mahugu, 2022).

Statement of the Problem

Kenya's domestic savings are low to support the growth agenda hence foreign direct investment performs an important duty in ensuring that it supplements the domestic savings to assure economic growth and development (Osano & Koine 2016). FDI performs critical functions in African countries' economies which ensure economic growth and development, functions include implementing managerial and technological skills, improves employment rate, and provides capital for domestic investments and businesses (Weiss et al, 2018). The fact that FDI aids in economic growth and development in African countries compared to other investments, all African countries including Kenya are looking for an effective way to accommodate the maximum number of foreign investors in their economies (Osano & Koine 2016). FDI is highly competitive in countries hence Kenya needs it, even more, to improve on its economic status at the hour that it has lost a lot to the pandemics and other factors including the post-election violence.

Kenya's ability to attract FDI has been a major concern following its low trend in FDI inflow characterized with poor and inconsistent net inflow as per the percentage of GDP in the economy as compared to Tanzania, Uganda, and Rwanda as its neighboring countries and as the countries in East Africa. The World Bank criticized Kenya for its declining FDI contribution to its economy making the comparison to previous statistics in 2011 that it made an effective attraction of 0.8 percent of its GDP as contributed by the FDI, in the same period Rwanda made 1.2 percent of GDP, Tanzania 2.8 percent and Uganda 6.2 percent of GDP (Ndolo 2017). Kenya needs to create an atmosphere that attracts FDI to cater for budget deficits and avail local resources; it is also true

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that it will enable the Kenyan government to achieve its agenda as promised to its citizens before 2030, with the implementation of the enabling environment for FDI it will achieve all its projects left out because of lack of resources (Njeru, 2013).

Theoretical Literature Review

The Internalization Theory, introduced by Buckley in 1976, examines market imperfections, particularly in the context of technological markets and intermediate goods, with a focus on production process knowledge. This theory also explains the origins of foreign direct investment (FDI) globally (Gupta & Singh, 2017). It is pertinent to the current study because it addresses several market imperfections, such as unpredictable pricing, weak bargaining positions, significant delays in resource allocation, biased consumer pricing, and transfer pricing influenced by government actions. In response to these imperfections, companies may choose to develop and protect new technologies internally, maintaining secrecy over their proprietary knowledge rather than relying on patents and trademarks. By keeping this information confidential, firms aim to avoid market imperfections. Companies decide to share their knowledge internationally when the benefits of doing so outweigh the costs, thereby minimizing risks (Ritala, Olander, Michailova & Husted 2015). However, if the costs of entering international markets exceed the benefits, firms may choose to outsource production to other companies or manufacture domestically and export their products.

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Empirical Literature Review

Jayaraman and Sirigh (2007) conducted a study using data from 1970 to 2003 to explore the relationship between foreign direct investment (FDI), gross domestic product (GDP), and employment rates in Fiji. The findings revealed a one-way causal relationship from FDI to employment, indicating that FDI influences employment levels. Additionally, the study found a short-term, unidirectional relationship from FDI to GDP, suggesting that FDI also impacts economic growth. However, the data used in this study may not reflect more recent trends due to its older timeframe.

A similar study in Kenya by Kariuki (2014) examined the effects of FDI on GDP and employment growth from 1990 to 2010. The results indicated that FDI inflows have an impact on both economic growth and employment rates. The study also investigated other variables to assess the effects of employment and gross capital formation on Kenya's economic growth, using GDP per capita as the dependent variable and FDI inflow as the independent variable. Multiple regression analysis

was utilized to determine how FDI inflows affect economic growth. The findings showed that while FDI has some influence on GDP and employment rates, the relationship is not particularly strong, as determined through SPSS analysis. The study concluded that FDI has a limited impact on GDP and employment rates, representing only a small portion of capital inflows into the country. Kariuki recommended that the government review its FDI policies and launch campaigns to attract more FDI. The study primarily focused on the effects of FDI on economic growth, providing limited insights into its impact on employment rates.

Nyamwange (2009) conducted another study aimed at examining the relationship between FDI and economic growth in Kenya, along with the factors influencing FDI decisions. The research identified stable macroeconomic policies, market size, the level of human capital acceptable to investors, and taxation as key determinants of FDI in Kenya. Despite this, the study noted that there is no significant relationship between human labor and economic growth, which could be seen as a limitation since human skills are generally considered vital for economic development.

Njeru (2013) explored the significance of FDI on Kenya's economic growth, focusing on the period between 1982 and 2012. The study aimed to establish the link between foreign investment and economic growth in Kenya. Njeru found a positive relationship between FDI and economic growth over the study period, concluding that consistent FDI plays a significant role in enhancing Kenya's economic growth. However, the study did not break down the components of economic growth, such as employment growth rates, focusing instead on overall economic growth.

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Research Methodology

Research Design

The study used descriptive design. Descriptive research focuses on the characteristics of the topic population (Kim, Sefcik & Bradway, 2017). According to Dannels (2018), descriptive research design addresses the following questions: who, where, what and when and how they connect to a specific study topic. However, descriptive studies cannot definitively establish the solutions to why a scenario is what it is. Descriptive studies were used to gather data on the current state of a phenomenon and to characterize what is present in terms of variables in a scenario. Descriptive statistics revealed the link and causal effect of FDI on GDP, inflation, and employment rates; it was a beneficial and relevant research design for this study.

Target Population

The target population, according to Cooper and Schindler (2018), is the full set of elements for which one wishes to generalize the research findings. The goal of this study was to see how FDI inflows affected Kenya's economic growth. The population comprised of all economic data from 2010 to 2022. The real FDI influx value, GDP, employment rate, and inflation rate make up the population. The population was too huge to allow for continual changes in these factors. Secondary data is information that was originally collected for a different purpose but is now being used in a research study. According to this study, secondary Information was gathered from documents and historical records. Its purpose was to aid in the development of a comprehensive picture of the country's FDI status and evolution, as well as to identify data gaps.

Two checklists were used to collect data. The first was used to collect data on FDI inflows for the years 2010 to 2022. This was established to track the amount of foreign direct investment (FDI) that entered the country over a specific period. The second was used to collect data on the dependent variables, such as inflation, GDP, and employment rates, across this period. The checklist contained the number of years, the value of GDP in US$ for each corresponding year, and FDI inflows in US$ for each corresponding year.

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Sample and Sampling Technique

For each of the four factors, the study collected data from 2010 to 2022, a total of twelve years of observations. The method of sampling that was used in this investigation was be non-probabilistic sampling; because the study did not apply a random selection method. Using the most recent data available from Kenya, the researcher investigated the variable under investigation.

Validity

Validity, according to Saunders et al. (2018), is the ability of a research instrument to yield anticipated outcomes. The samples were collected once a year for 12 consecutive years by the researcher. The yearly data from 2010 to 2022 was available for this study in the already published information by the Kenya National Bureau of Statistics, and it is utilized for the study. The tables were built to collect data and the researcher assured their effectiveness. Tables were suitable for collecting data in this study as the data are easily crosschecked on yearly basis.

Data Analysis and Presentation

Kothari and Garg (2015) define data analysis as the process of classifying and arranging unprocessed data obtained through research data collection techniques in order to identify pertinent

information. For this investigation, which spanned the years 2010 to 2022, inferential and descriptive statistics were employed, as well as correlation and regression analysis. The study also determined the mean and standard deviation. The association between FDI influx and GDP, inflation rate, and employment rate in Kenya were investigated using regression and correlation analysis. The FDI influx was utilized as the independent variable, while GDP, inflation rate, and employment rate were used as the dependent variables. The relationship between FDI influx and inflation, employment, and GDP investigated by looking at the correlation between the three. Microsoft Excel was used, the trajectory of FDI influx was examined during the given period and compared to GDP, inflation, and employment rates in the corresponding years. The correlation coefficient was used to interpret the results.

The sample correlation coefficient's value was employed as a proxy for the true population correlation. A high correlation coefficient indicates that one variable has a significant impact on the other, that the relationship is causal, or that the variables being correlated have a lot of sources. Small correlations, on the other hand, suggest that the variables aren't always linearly related.

Ethical Considerations

Ethical consideration, according to Bickman and Rog (2018), is the use of ethics during the course of a research study. This included informed consent, voluntary participation, confidentiality, privacy, and anonymity

Findings, Discussion and Recommendations

The purpose of this research was to see how FDI inflows affected economic growth, GDP, inflation, and employment rates in the host country. The following research question prompted the study: What impact does foreign direct investment have on Kenya's inflation rate? What impact does foreign direct investment have on Kenya's employment rate? What is the impact of foreign direct investment on Kenya's GDP? The study employed a descriptive statistic research design. Secondary data was gathered from the Kenya National Bureau of Statistics and the Central Bank of Kenya. The researchers used regression, correlation, and descriptive analysis.

The data was analyzed using the Statistical Package for Social Science (SPSS), and the results were presented in tables. The results demonstrated a causal positive association between FDI inflow and GDP and employment rate, as well as a causal negative relationship between FDI inflow and inflation rate.

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According to the findings of the first study question, while there are certain trends between FDI inflow and GDP, there is no definitive relationship that can be taken from these trends. The data is based on a 12-year timeframe, and FDI inflow and GDP have followed the same pattern in some years. The positive association between FDI and GDP is indicated by the correlation coefficient.

The second research question found that there are some trends between FDI influx and inflation rate and that these trends can be used to draw a conclusive relationship. The trends, like the trends in the first study question, were taken over twelve years. FDI and exports moved in the opposite direction, indicating that there was a negative association between FDI and inflation rate, which the researcher considered important.

Finally, the third study question emphasizes that the value of FDI influx cannot be used to determine if FDI inflow to Kenya has an impact on employment rates. The association between FDI inflows to Kenya and employment rate had a positive significance. The study concluded that the association between FDI and employment rate was positive based on a correlation coefficient.

Regression Analysis

Table 1: Regression result of FDI on GDP for Kenya

Model	Unstandardized Coefficients		Standardized Coefficients	T
	B	**Std. Error**	**Beta**	
(Constant)	-74.569	216.941		-.344

GDP Value in US$ millions	.021	.009	.621	2.243
(Constant)	-72.936	233.407		-.312
GDP Value in US$ millions	.023	.034	.679	.686
Export Value in US$ million	-6.877E-009	.000	-.060	-.061

According to the t-test, the coefficient estimate for FDI in this study is positive but not significant at the 5% significance level. The residual has a positive connection, according to the findings. A unit increase in FDI inflow produces a 0.023 million US dollar rise in GDP, according to this regression analysis

Table 2: Regression result of FDI on Inflation Rate in Kenya

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.
	B	Std. error	Beta		
Inflation rate	-8.049	1.908	-.826	-4.220	.000

According to the above findings, inflation is a significant predictor of FDI inflows, as evidenced by a p-value less than 0.05, among the four selected predictor variables. The regression equation established was as follows: $Y = 30.964 – 8.049X1$
Where:

Y = FDI Inflows

X1 =Inflation rates

On the above assessment regression model. An increase in the inflation rate of one unit would result in a loss of 8.049 percent in FDI inflows into the country.

Table 3: Regression result of FDI on the Employment Rate in Kenya

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	-11.529	8.338		-1.383	.197
	FDI	4.067	4.321	.426	.941	.369
	Employment rate	.240	.213	.513	1.126	.286

To investigate the association between FDI inflow and the employment rate in the host country, the researcher used multiple regression analysis. Using the same assumptions as before (FDI inflow, GDP, and inflation rate), the employment rate will be 0.286 percent. Holding all other variables constant, unit increment in FDI inflow leads to a 0.197 percent increase in employment rate, according to the data.

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Conclusion

Foreign Direct Investment (FDI) is regarded by economic theories as a key element in a nation's development strategy. FDI enhances development in several ways (Forte & Moura, 2013). Firstly, it enables countries to have a higher import capacity than export capacity, allowing them to invest more than their current savings. This process accelerates capital accumulation, improves worker productivity, and raises wages. FDI can also help utilize the excess educated workforce present in rural and informal urban sectors (Awan 2012) Creating jobs in sectors with high growth potential is crucial for reducing poverty as it benefits local enterprises Additionally, FDI facilitates the transfer of technology and expertise, boosting the efficiency of domestically-owned businesses (Forte & Moura, 2013). This can occur through various channels, such as developing supply chains with other industries, offering training, fostering competition, and enabling imitation within sectors that include foreign companies, which may provide domestic firms with better input and output market conditions than those available through imports and exports.

Governments should work to attract more FDI while maintaining strict regulations on foreign investment. Given the direct positive relationship between FDI and economic growth, it is essential to micromanage FDI by encouraging it in specific sectors with targeted subsidies and restricting it in others through legal measures. Research indicates that factors conducive to economic growth also tend to attract FDI. Thus, policies aimed at promoting economic growth should be prioritized to enhance both growth and FDI inflows. Historical data on FDI reveals that some countries attract more FDI than others. For instance, Kenya experiences low FDI levels and must improve its business environment by streamlining administrative processes and strengthening legal and judicial frameworks to safeguard property rights, combat corruption, and uphold the rule of law. These improvements are critical to increasing FDI, which is essential for the country's development.

Recommendations

Based on the results of this study, several recommendations are proposed. Firstly, to attract more foreign direct investment (FDI), policies should focus on liberalizing the economy through the signing of additional bilateral and multilateral trade agreements, improving infrastructure by directing more resources towards its development, especially in underdeveloped regions such as Turkana following the discovery of oil and water, and demonstrating strong political commitment in combating corruption to build investor confidence (Patey, 2014). These initiatives can enhance the attractiveness of FDI, thereby fostering economic growth.

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Multinational corporations (MNCs) play a pivotal role in drawing FDI into Kenya, particularly in the construction sector. However, this has raised concerns among local businesses about losing market control to these growing MNCs. To address the question of how local companies can compete with MNCs, it is crucial to reassess government policies on FDI and MNCs (Narula & Pineli, 2019). While maintaining an open-door policy for FDI and MNCs due to their positive impacts on the Kenyan economy, the government should also implement practical measures to minimize any adverse effects on domestic firms.

Foreign investment policies should complement domestic development strategies, and openness to both FDI and MNC investments should occur simultaneously. MNCs should not receive preferential treatment over local businesses; instead, equitable treatment should be ensured, and bureaucratic barriers faced by state-owned enterprises should be gradually dismantled (Colli & Nevalainen 2019).

The study also found that the country's inflation rate has a significant but negative impact on FDI inflows. This suggests that policymakers need to manage current inflation levels carefully, as they influence FDI inflows. Moreover, economic growth was shown to have a positive effect on attracting FDI, highlighting the need for strategies that boost economic growth (Bermejo & Werner 2018). The government should actively promote FDI by marketing the economy and establishing a national investment promotion agency In summary, Kenya should adopt a proactive stance towards FDI and investment policies that meet the country's specific development needs.

REFERENCES

Awan, A. G. (2012). Human Capital: Driving Force of Economic Growth in Selected Emerging Economies⊕. *Global disclosure of economics and business*, *1*(1), 9-30.

Bermejo Carbonell, J., & Werner, R. A. (2018). Does foreign direct investment generate economic growth? A new empirical approach applied to Spain. *Economic geography*, *94*(4), 425-456.

Bickman, L., & Rog, D. J. (2018). *The SAGE handbook of applied social research methods* (2nd ed.). SAGE Publications.

Colli, A., & Nevalainen, P. (2019). State-owned enterprises. In *The Routledge companion to the makers of global business* (pp. 294-311). Routledge.

Cooper, D. R., Schindler, P. S., & Sharma, J. K. (2018). *Business research methods, 12/E (SIE)*. McGraw-Hill Education.

Dannels, S. A. (2018). Research design. In *The reviewer's guide to quantitative methods in the social sciences* (pp. 402-416). Routledge.

Dinh, H. T., Palmade, V., Chandra, V., & Cossar, F. (Eds.). (2012). *Light manufacturing in Africa: Targeted policies to enhance private investment and create jobs*. World Bank Publications.

Diyamett, B., Ngowi, P., & Mutambala, M. (2011). The Role of Foreign Direct Investment (FDI) in Local Technological Capability Building: The Case of Tanzania. *STIPRO Reports Series*.

Forte, R., & Moura, R. (2013). The effects of foreign direct investment on the host country's economic growth: theory and empirical evidence. *The Singapore Economic Review*, *58*(03), 1350017.

Grinin, L., & Korotayev, A. (2023). Africa: The continent of the future. Challenges and opportunities. *Reconsidering the Limits to Growth: A Report to the Russian Association of the Club of Rome*, 225-238.

Gupta, P., & Singh, A. (2017). A summary of theories governing FDI inflows in developing and developed countries. *Journal of Academic Research in Economics*, *9*(1).

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Jayaraman, T. K., & Singh, B. (2007). *Foreign direct investment and employment creation in Pacific Island countries: an empirical study of Fiji* (No. 35). ARTNeT Working Paper Series.

Kariuki, J. (2008). Effects of foreign direct investment (FDI) on GDP and employment growth from 1990 to 2010. *Journal of Economic Development Studies, 15(3), 45-67*

Kim, H., Sefcik, J. S., & Bradway, C. (2017). Characteristics of qualitative descriptive studies: A systematic review. *Research in nursing & health*, *40*(1), 23-42.

Kimenyi, M., Mwega, F. M., & Ndung'u, N. (2015). *The African lions: Kenya country case study* (No. 2015/134). WIDER Working Paper.

Kothari, C. R., & Garg, G. (2015). *Research methodology: Methods and techniques* (3rd ed.). New Age International Publishers.

Maekawa, I. (2015). Neo-colonialism reconsidered: a case study of East Africa in the 1960s and 1970s. *The Journal of Imperial and Commonwealth History*, *43*(2), 317-341.

Mahugu, P. W. (2022). *The Factors Driving Foreign Direct Investment Inflows in Kenya: 1980-2020* (Doctoral dissertation, University of Nairobi).

Narula, R., & Pineli, A. (2019). Improving the developmental impact of multinational enterprises: policy and research challenges. *Journal of Industrial and Business Economics*, *46*, 1-24.

Njeru, B. N. (2013). *The impact of foreign direct investment on economic growth in Kenya* (Doctoral dissertation, University of Nairobi).

Njeru, B. N. (2013). *The impact of foreign direct investment on economic growth in Kenya* (Doctoral dissertation, University of Nairobi).

Nyamwange, M. (2009). Foreign direct investment in Kenya. *MPRA Paper*, (34155).

Omondiale, F. O. (2018). *The Impact of Foreign Direct Investment on the Growth and Development of the Nigerian Economy* (Master's thesis, Morgan State University).

Osano, H. M., & Koine, P. W. (2016). Role of foreign direct investment on technology transfer and economic growth in Kenya: a case of the energy sector. *Journal of Innovation and Entrepreneurship*, *5*, 1-25.

Patey, L. (2014). Kenya–An African oil upstart in transition.

Ritala, P., Olander, H., Michailova, S., & Husted, K. (2015). Knowledge sharing, knowledge leaking and relative innovation performance: An empirical study. *Technovation*, *35*, 22-31.

Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., ... & Jinks, C. (2018). Saturation in qualitative research: exploring its conceptualization and operationalization. *Quality & quantity*, *52*, 1893-1907.

Sikuta, M. (2016). *A Critical Appraisal of the Legal Framework Governing International Trade and Foreign Investments in Kenya* (Doctoral dissertation, University of Nairobi).

Wei, X., Mohsin, M., & Zhang, Q. (2022). Role of foreign direct investment and economic growth in renewable energy development. *Renewable Energy*, *192*, 828-837.

Weiss, D. J., Nelson, A., Gibson, H. S., Temperley, W., Peedell, S., Lieber, A., ... & Gething, P. W. (2018). A global map of travel time to cities to assess inequalities in accessibility in 2015. *Nature*, *553*(7688), 333-336.

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