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DOES LOW FOREIGN DIRECT INVESTMENT PERPETUATE ITSELF IN ANGOLA?

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ABSTRACT

This study examines the persistence of low foreign direct investment (FDI) in Angola by applying autoregressive moving average (ARMA) approach to historical data from 1980 to 2023. Using World Bank data, FDI net inflows (% of GDP) are modelled as the dependent variable, while autoregressive (AR) and moving average (MA) components serve as independent variables. Generalized least squares (GLS) estimation reveals a positive and statistically significant AR(1) coefficient (0.824179), indicating that approximately 82.4% of current FDI levels are influenced by past trends, suggesting a self-perpetuating cycle of low FDI inflows. The estimated ARMA(1,1) model is found to be covariance stationary and invertible, confirming its robustness for forecasting FDI trends. Projections from 2024 to 2043 indicate a gradual but modest improvement, with FDI increasing from -2.5% in 2024 to 2.3% by 2043, though it remains insufficient to drive substantial economic transformation. Based on these findings, we recommend, implementing investment-friendly policies, improving infrastructure, diversifying economic sectors, and fostering regional trade agreements to break the cycle of low FDI inflows and stimulate sustainable investment growth in Angola.

KEY WORDS: *ARMA Modelling, Foreign Direct Investment, Angola*

INTRODUCTION

Foreign direct investment (FDI) is widely recognized as a critical driver of economic growth, industrialization, and employment creation, particularly in developing economies (UNCTAD, 2022). However, Angola has experienced persistently low FDI inflows, with several periods of negative net inflows, notably from 2005-2007, 2010-2013, and 2016-2023 (World Bank, 2023). This persistent trend raises concerns about whether low FDI inflows create a self-reinforcing cycle, where inadequate investment discourages further capital inflows, thereby hindering economic development.

Angola's economy remains highly dependent on the oil sector, making it vulnerable to external shocks and fluctuations in global commodity prices (IMF, 2021). Despite efforts to diversify the economy and attract foreign investors, challenges such as weak institutions, policy uncertainty, inadequate infrastructure, and limited economic diversification continue to deter FDI inflows (AfDB, 2022). The prolonged negative FDI trends suggest that investor confidence remains low, further exacerbating economic stagnation and underdevelopment.

The rationale for this study is to examine the persistence of low FDI inflows in Angola and determine whether past investment trends influence future FDI behavior. By employing autoregressive moving average (ARMA) modelling, this study aims to quantify the degree of FDI persistence, identify key structural constraints, and provide empirical evidence for policy recommendations to break the cycle of low investment. Understanding these dynamics is crucial for policymakers seeking to enhance Angola's investment climate, foster sustainable economic growth, and improve long-term economic stability.

LITERATURE REVIEW

Foreign direct investment (FDI) plays a crucial role in economic growth, technological transfer, and industrial development, particularly in emerging economies (UNCTAD, 2022). However, Angola has experienced persistent low and negative FDI inflows, raising concerns about whether low FDI perpetuates itself over time. This section critically reviews existing literature on FDI trends globally, regionally, and locally while integrating theoretical and conceptual frameworks relevant to the study.

Globally, FDI inflows tend to follow a self-reinforcing pattern, where countries with strong investment climates attract continuous inflows, while those with weak economic fundamentals struggle to break out of low-investment cycles (Dunning, 1993). According to UNCTAD (2022), global FDI flows have increasingly been concentrated in developed economies and emerging markets with strong institutional frameworks, leaving fragile economies vulnerable to capital flight. Studies by Alfaro et al. (2004) highlight that macroeconomic stability, infrastructure quality, and policy certainty are key determinants of FDI persistence. In contrast, economies facing political instability, currency depreciation, and inconsistent policies experience cyclical FDI inflows, making it difficult to sustain long-term investment (Rodrik, 2018). This suggests that countries like Angola, with fluctuating FDI inflows, may require structural reforms to break free from the cycle of low investment.

FDI inflows in Sub-Saharan Africa (SSA) have historically been volatile and highly dependent on natural resource extraction (AfDB, 2022). Countries such as Nigeria, South Africa, and Kenya have managed to sustain moderate FDI inflows due to diversified economies, while others, including Angola, remain highly dependent on oil exports (IMF, 2021). Research by Asiedu (2006) emphasizes that FDI persistence in SSA is largely influenced by governance quality, ease of doing business, and investor confidence. Studies by Twimukye (2006) also reveal that countries that fail to diversify beyond commodity-based FDI often experience prolonged investment downturns. Angola's situation aligns with this trend, as negative FDI inflows during 2005-2007, 2010-2013, and 2016-2023 coincide with oil price shocks, political instability, and economic downturns (World Bank, 2023).

Angola's FDI landscape has been highly unstable, with foreign investors frequently withdrawing capital due to economic uncertainty, regulatory challenges, and declining oil revenues (IMF, 2021). According to the AfDB (2022), the country has made efforts to improve its business environment through reforms such as private sector incentives, anti-corruption measures, and trade liberalization. However, the results have been mixed, with FDI remaining below pre-2014 levels. Reports by USDS (2023) indicate that Angola's weak economic diversification and over-reliance on extractive industries deter long-term FDI growth. Report by IMF, (2021) further highlights the need for institutional strengthening and financial sector reforms to enhance investor confidence and attract sustainable investment.

This study is grounded in the Investment Development Path (IDP) Theory by Dunning (1981), which postulates that the net outward direct investment situation of an economy is methodically correlated with its economic progress, vis-à-vis other countries. Angola appears to be stuck in the early stages, where low domestic investment, poor institutional frameworks, and external shocks hinder sustained FDI inflows. Additionally, the Dependency Theory (Prebisch, 1950), an approach to understanding economic underdevelopment that emphasizes the putative constraints imposed by the global political and economic order, suggests that Angola's historical dependence on foreign capital in extractive industries has resulted in a cycle of low reinvestment and economic vulnerability. This aligns with studies showing that resource-dependent economies struggle to attract diversified foreign investments (Auty, 2001).

The study conceptualizes FDI net inflows (% of GDP) as the dependent variable, with autoregressive (AR) and moving average (MA) components serving as independent variables. Several studies have employed ARMA and ARIMA models to analyze FDI dynamics, highlighting the persistence of investment trends over time and the impact of macroeconomic factors (Enders, 2015; Hyndman & Athanasopoulos, 2018; Nahabwe & Kagarura, 2025). Empirical findings indicate that past FDI inflows significantly influence future investments, underscoring the path-dependent nature of FDI (Borensztein, et al. 1998; Asiedu, 2006). The literature indicates that low FDI can perpetuate itself, particularly in economies with weak institutional frameworks, policy inconsistencies, and reliance on volatile resource sectors. Angola's historical FDI trends suggest that breaking this cycle requires structural reforms, economic diversification, and long-term policy stability. This study builds on previous research by applying ARMA modelling to empirically test the persistence of low FDI inflows in Angola.

DATA AND METHODS

This study employs a quantitative research design, utilizing time-series econometric modelling to analyze the persistence of low foreign direct investment (FDI) in Angola. A longitudinal approach is adopted, tracking historical

FDI trends from 1980 to 2023 to assess whether low FDI inflows perpetuate themselves over time. Autoregressive moving average (ARMA) model is applied, as it is well-suited for analyzing time-dependent economic variables (Gujarati & Porter, 2020). The study relies on secondary data sourced from the World Bank's World Development Indicators (WDI) database. The key variable under investigation is FDI net inflows (% of GDP), covering a 44-year period (1980-2023).

The dependent variable is FDI net inflows (% of GDP) while independent variables are the autoregressive (AR) components, capturing past FDI values to examine persistence, and moving average (MA) components, accounting for the effects of past shocks or fluctuations. Since the study analyzes the entire population of FDI inflows in Angola over a 44-year period, a non-probabilistic, purposive sampling technique is used, ensuring that all available data points are included (Enders, 2015). This approach ensures representativeness and minimizes bias, as it captures both short-term fluctuations and long-term trends in Angola's FDI inflows.

The study applies autoregressive moving average (ARMA) modelling approach, a widely used technique for forecasting stationary economic and financial time series. The choice of ARMA modelling is justified by its ability to capture dynamic relationships in time-series data and provide robust forecasts (Box & Jenkins, 1976; Nahabwe & Kagarura, 2025). Unlike standard regression models, ARMA accounts for past trends, cyclical patterns, and external shocks, making it highly suitable for analyzing FDI persistence.

ARIMA (p, q) model specification is as follows:

$$Y_t = \mu + \varepsilon_t + \boldsymbol{\phi}_1 Y_{t-1} + \boldsymbol{\phi}_2 Y_{t-2} + \ldots + \boldsymbol{\phi}_p Y_{t-p} + \theta_1 \varepsilon_{t-1} + \theta_2 \varepsilon_{t-2} + \ldots + \theta_q \varepsilon_{t-q} \ldots\ldots\ldots\ldots (1)$$

Where;
Y_t is the value of the series at time t
μ is the mean of the series
ε_t is white noise
$\boldsymbol{\phi}_1, \boldsymbol{\phi}_2, \ldots \boldsymbol{\phi}_p$ are the coefficients of the AR (p) component
$\theta_1, \theta_2, \ldots \theta_q$ are the coefficients of the MA (q) component
p is the order of the autoregressive part, representing the number of past values considered
q is the order of the moving average part, indicating the number of past errors considered (Box & Jenkins 1976; Nahabwe & Kagarura, 2025)

Generalized least squares (GLS) estimation is selected for its ability to effectively handle time-series data that exhibits serial correlation and heteroscedasticity, thus providing more reliable and efficient parameter estimates compared to ordinary least squares (OLS) in this context. The GLS procedure adjusts for potential correlations and non-constant variances in the error terms, which are common in time-series data (Greene 2018; Wooldridge 2016). The GLS estimator for the regression coefficients is given by the following formula:

$$\hat{\beta} = (X'\Omega^{-1}X)^{-1}X'\Omega^{-1}y$$

Where:
$\hat{\beta}$ is column matrix of coefficients
X is the matrix of independent variables
y is the column vector of the dependent variable
Ω is the variance-covariance matrix of the error terms, accounting for both heteroscedasticity and autocorrelation in the residuals (Greene, 2018; Nahabwe & Kagarura, 2025).

Diagnostic tests, including the Augmented Dickey-Fuller (ADF) test for stationarity (Dickey & Fuller, 1979) and the Akaike Information Criterion (AIC) for model selection (Akaike, 1974), are conducted to ensure the robustness of the ARMA model for forecasting. The ARMA approach is particularly advantageous for modelling FDI as it captures past trends to generate reliable future projections (Enders, 2014). Given its ability to handle stationary data, ARMA is well-suited for analyzing economic time series, where trends and fluctuations do not vary significantly over time (Stock & Watson, 2015). This methodological rigor strengthens the study's findings, providing valuable policy insights to support strategic planning for enhancing Angola's FDI inflows.

RESULTS

This section presents the descriptive statistics (Appendix 1), for foreign direct investment (FDI) net inflows (% of GDP) in Angola from 1980 to 2023, covering 44 observations (years). These statistics provide insights into the distribution, central tendency, dispersion, and shape of Angola's FDI inflows over the study period. The average FDI inflow as a percentage of GDP in Angola over the 44-year period is 3.17%, indicating that, on average, foreign investments contributed a small but positive share to Angola's economy (World Bank, 2023). The median (1.85%), which represents the middle value in the dataset, is lower than the mean, suggesting that FDI distribution is positively skewed, meaning there were a few years with exceptionally high FDI inflows that pulled the mean upwards.

The highest FDI inflow was 40.17% of GDP (1999), whereas the lowest was -10.04% (2017), which indicates significant variation in Angola's FDI inflows. The negative value suggests that in some years, capital outflows exceeded inflows, reflecting disinvestment or repatriation of profits (IMF, 2021). A relatively high standard deviation of 9.05% shows considerable fluctuations in FDI inflows, highlighting the instability and volatility of foreign investments in Angola (Hyndman & Athanasopoulos, 2018). The distribution is positively skewed, meaning there were more years with low FDI inflows and a few years with exceptionally high inflows. This suggests that Angola's FDI trends have been sporadic, with occasional large investments but mostly low levels of inflows (Gujarati & Porter, 2020). The kurtosis value of 8.10 indicates a leptokurtic distribution, meaning the dataset has more extreme values than a normal distribution, further confirming the presence of outliers or high fluctuations in FDI inflows. Jarque-Bera Statistic (74.49, p-value = 0.000) confirm that Angola's FDI distribution is non-normal, meaning that extreme variations in FDI inflows deviate from a typical bell-shaped curve (Enders, 2015).

Stationarity test (Appendix 2) is conducted using the Augmented Dickey-Fuller (ADF) test to assess the presence of unit roots. Results indicate that the original FDI series is stationary in level, eliminating the need for differencing. This confirms that the series is integrated of order zero (I(0)), justifying the application of an ARMA model rather than an ARIMA model. ARMA(1,1) model is selected as the best fit based on the Akaike Information Criterion (AIC = 6.916615) and the Hannan-Quinn Criterion (H-QC = 6.961728). Parameter estimates are as follows: AR(1) = 0.824179 (p = 0.0000), statistically significant, indicating strong dependence on past FDI values.
MA(1) = -0.381037 (p = 0.1088), statistically insignificant, suggesting that past errors do not significantly influence current FDI trends. C = 2.441795 (p = 0.5075), statistically insignificant, implying that the constant term does not play a crucial role in explaining FDI variations. Diagnostic checks confirm the model's adequacy and robustness. Ljung-Box Q test fails to reject the null hypothesis of white noise (p = 0.403), confirming the absence of serial correlation. Additionally, autocorrelation function (ACF) plots reveal no significant patterns, further validating the model's reliability for forecasting Angola's FDI trends.

Results are summarized as follows:
Results of the ARMA(1,1) model (Appendix 3)

$\widehat{FDI}_t$ = 2.441795 + 0.824179AR(1) - 0.381037MA(1) ……………............................… (2)

Hence,

$$\hat{\beta} = \begin{bmatrix} 2.441795 \\ 0.824179 \\ -0.381037 \end{bmatrix}$$

This section presents the inferential statistics of the ARMA(1,1) model used to analyze foreign direct investment (FDI) trends in Angola. The results provide insights into the model's coefficients, statistical significance, residual diagnostics, and forecast performance. The constant term (2.441795, p = 0.5075) is statistically insignificant (p > 0.05), indicating that it does not have a meaningful impact on FDI inflows. This suggests that FDI fluctuations are primarily driven by past values and external shocks rather than an inherent baseline trend (Gujarati & Porter, 2020). AR(1) Coefficient (0.824179, p = 0.0000) is positive and statistically significant (p < 0.05), implying that approximately 82.4% of current FDI is influenced by past FDI trends. This confirms the persistence of FDI inflows, meaning that low FDI levels in previous years contribute to continued low FDI in subsequent periods, reinforcing the study's hypothesis (Enders, 2015). MA(1) Coefficient (-0.381037, p = 0.1088) is negative and statistically insignificant (p > 0.05), suggesting that past errors or shocks do not significantly influence current FDI trends. This

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implies that short-term fluctuations in FDI are not strongly driven by unpredictable shocks but rather by longer-term structural factors (Hyndman & Athanasopoulos, 2018; Nahabwe & Kagarura, 2025).

Adjusted R-Squared (0.332623) means that the model explains approximately 33.3% of the variation in FDI inflows, indicating a moderate explanatory power. This suggests that additional factors, such as political stability, macroeconomic policies, and global economic conditions, may also influence FDI inflows beyond historical patterns (Box & Jenkins, 1976; Nahabwe et al., 2025). Durbin-Watson Statistic (2.042310) is close to 2, indicating no significant autocorrelation in the residuals. This confirms that the model is well-specified and does not suffer from serial correlation issues, making it suitable for forecasting (Gujarati & Porter, 2020; Nahabwe & Kagarura, 2025). The high kurtosis value (8.86) and statistically significant Jarque-Bera test ($p < 0.05$) indicate that the residuals deviate from normality, exhibiting fat tails. This suggests the presence of occasional extreme values in FDI inflows, reflecting Angola's historically volatile investment climate (Enders, 2015). Ljung-Box Q Test ($p = 0.403$) means that we fail to reject the null hypothesis, confirming that the residuals are white noise. This implies that the model captures all systematic patterns in the data, leaving only random fluctuations, which is a desirable property for forecasting (Hyndman & Athanasopoulos, 2018; Nahabwe & Kagarura, 2025). Further diagnostics confirm that the AR(1) and MA(1) roots lie within the unit circle, ensuring that the model is covariance stationary and invertible. This means the model is stable and reliable for making future projections (Box & Jenkins, 1976; Nahabwe & Kagarura, 2025). Projections (Appendices 7 and 8) indicate a gradual but modest improvement in FDI inflows, rising from -2.5% in 2024 to 2.3% by 2043. However, despite this positive trajectory, the projected FDI levels remain relatively low, suggesting that Angola's FDI environment requires significant structural improvements to achieve substantial economic transformation.

DISCUSSION

The findings of this study provide empirical evidence supporting the persistence of low foreign direct investment (FDI) in Angola, aligning with previous research on the path-dependent nature of FDI inflows. The AR(1) coefficient of 0.824179, which is positive and statistically significant, confirms that past FDI trends strongly influence current FDI inflows, reinforcing the notion that low FDI tends to perpetuate itself over time. This is consistent with studies by Dunning (1993) and Asiedu (2002), which argue that countries with historically low FDI struggle to attract new investors due to perceived risks and underdeveloped investment climates. The persistence of FDI in Angola aligns with the findings of Campos & Kinoshita (2008), who observed that countries with low initial FDI levels often experience continued weak inflows unless major economic or institutional reforms are implemented. Similarly, Alfaro et al. (2004) highlight that macroeconomic stability, infrastructure quality, and governance reforms play a crucial role in breaking this cycle. The stationarity of FDI at level I(0) in this study indicates that external shocks or policy changes have limited long-term impact, unless sustained over time.

In contrast, Borensztein et al. (1998) found that in countries with strong absorptive capacity such as skilled labor and advanced technology, FDI inflows tend to exhibit less persistence and respond more dynamically to economic reforms. This difference suggests that Angola's structural weaknesses, including poor infrastructure, political uncertainty, and regulatory barriers, contribute to its inability to attract and retain significant FDI. The negative and statistically insignificant MA(1) coefficient (-0.381037, $p = 0.1088$) further differentiates this study from others, as it suggests that short-term fluctuations in FDI inflows are not driven by immediate past forecast errors but rather by long-term investment trends. This aligns with Blonigen (2005), who emphasized that FDI persistence is often more structural than cyclical, meaning that temporary incentives or policy shifts may have limited impact unless supported by broader institutional reforms.

This study contributes to the literature by providing a time-series analysis specific to Angola, spanning over four decades (1980-2023). Unlike previous studies that focus on regional trends (e.g., Asiedu, 2006), this research provides a country-specific model that quantifies the degree of FDI persistence. The findings show that FDI inflows in Angola are not only low but also highly volatile, with periods of negative net inflows (e.g., 2005-2007, 2010-2013, 2016-2023). Additionally, the forecast projections (2024-2043) reveal only a modest improvement in FDI inflows, rising from -2.5% in 2024 to 2.3% by 2043. This suggests that without significant structural reforms, Angola's FDI levels will remain insufficient to drive substantial economic transformation. This is particularly concerning given that FDI is a critical driver of economic growth and industrialization, as emphasized by the World Bank (2023). Moreover, the high kurtosis value (8.86) and Jarque-Bera statistic (83.2, p = 0.0000) indicate the presence of extreme values, reflecting the erratic nature of FDI inflows in Angola. Unlike countries where FDI exhibits a more stable trajectory (e.g., South Africa, Nigeria), Angola's investment environment is characterized by sudden spikes and declines, possibly due to political instability, oil price fluctuations, and inconsistent economic policies (UNCTAD, 2022). The results emphasize the need for long-term strategies to break the cycle of low FDI in Angola. Given the strong path dependence observed, policy interventions must focus on macroeconomic stability, investment-friendly regulations, and infrastructure development to build investor confidence (Dunning, 1993). Additionally, further research could explore sector-specific FDI trends, assessing whether certain industries (e.g., oil and gas, manufacturing) exhibit different levels of persistence.

LIMITATIONS

While this study provides valuable insights into the persistence of Foreign Direct Investment (FDI) in Angola, it is subject to several limitations related to research design, sample size, and data analytical procedures, which may have affected the findings. The study relies on annual FDI net inflows (% of GDP) data from 1980 to 2023, sourced from the World Bank (2023). While this dataset provides a long-term perspective, the use of annual data reduces the number of observations to 44, which may limit the precision of the model estimates. Higher-frequency data (e.g., quarterly or monthly) could enhance the robustness of the findings by capturing short-term fluctuations in FDI trends (Gujarati & Porter, 2020). Additionally, the study does not account for sectoral differences in FDI inflows. Angola's economy is heavily reliant on oil and natural resources, which may experience different investment patterns compared to manufacturing, services, or technology sectors (UNCTAD, 2022). Future research should consider sectoral decomposition of FDI to assess whether investment trends differ across industries.

The study employs an autoregressive moving average (ARMA) model, specifically ARMA(1,1), based on stationarity tests that confirmed integration of order zero, I(0). While ARMA models are effective for short- and medium-term forecasting, they do not incorporate exogenous variables that may influence FDI, such as macroeconomic policies, political risk, trade openness, and infrastructure quality (Enders, 2015). This limitation implies that the model captures only the historical inertia of FDI without considering external drivers that could break the cycle of low FDI. Another constraint is the assumption of linearity in ARMA modelling. FDI dynamics may be influenced by nonlinear relationships, such as threshold effects, regime shifts, or global economic shocks. Advanced techniques such as Vector Autoregression (VAR), Cointegration Analysis, or Machine Learning models could provide deeper insights into causal relationships between FDI and economic variables (Blonigen, 2005).

The study assumes structural stability over the 44-year period, meaning that major external shocks or policy shifts do not fundamentally alter FDI dynamics. However, Angola has undergone significant political and economic transitions, including: The civil war (1975-2002), which disrupted investment flows (Nzongola-Ntalaja, 2013). Oil price crashes (2014-2016, 2020), which heavily impacted FDI in Angola's extractive sector (UNCTAD, 2022). Economic and political reforms post-2017, following leadership changes and new investment policies. Failure to explicitly model these structural breaks may lead to overestimation of FDI persistence. Future studies could apply structural break tests, regime-switching models, or event studies to assess the impact of these factors on FDI inflows (Borensztein et al., 1998).

Although the study provides a detailed country-specific analysis, its findings may not be fully generalizable to other developing economies. Angola's FDI environment is shaped by unique factors such as oil dependence, governance challenges, and historical instability. Comparative studies with other resource-rich African economies, such as Nigeria or Algeria, could help determine whether FDI persistence is a broader regional phenomenon or specific to Angola (Asiedu, 2006). While the study highlights FDI persistence and low investment recovery, it does not quantify the effectiveness of specific policy interventions. For instance, which policies have had the most significant impact on attracting FDI in Angola? Future research should employ policy impact evaluation models, such as Difference-in-Differences (DID) or Synthetic Control Methods, to assess the effectiveness of investment incentives (Dunning, 1993). Moreover, the lack of informal sector investment data limits the scope of the analysis. Many foreign investors in Angola operate outside official records, particularly in sectors such as construction and retail, which could mean that official FDI statistics underestimate actual investment flows (World Bank, 2023).

CONCLUSION

This study explores the persistence of Foreign Direct Investment (FDI) in Angola, examining whether low FDI inflows contribute to continued underperformance in attracting investment. By applying autoregressive moving average (ARIMA) model to FDI trends from 1980 to 2023, the study highlights the structural and economic challenges that have contributed to Angola's investment climate. The findings underscore the existence of strong FDI inertia, where past trends significantly influence current and future inflows, indicating that low FDI may indeed perpetuate itself over time.

A critical takeaway from the study is that while Angola has experienced fluctuations in FDI inflows, including periods of negative net investment (e.g., 2005-2007, 2010-2013, and 2016-2023), there has been no substantial structural shift to break this cycle. The historical dependence on oil and natural resources, macroeconomic instability, weak institutional frameworks, and inadequate infrastructure have collectively deterred foreign investors (Asiedu, 2006; UNCTAD, 2022). Moreover, the findings reinforce previous research, which suggests that countries with persistent FDI stagnation often struggle to attract new investments due to perceived risks and low investor confidence (Dunning, 1993; Borensztein et al., 1998).

From a policy perspective, these results emphasize the need for comprehensive reforms aimed at diversifying the economy beyond oil dependence, strengthening macroeconomic stability, improving governance, and fostering a more investor-friendly regulatory environment (World Bank, 2023). While projections indicate a gradual increase in FDI inflows from 2024 to 2043, the anticipated levels remain insufficient to drive meaningful economic transformation, reinforcing the urgency for targeted interventions (Hyndman & Athanasopoulos, 2018). Ultimately, this study contributes to the ongoing discourse on FDI sustainability in developing economies, particularly in resource-rich but investment-challenged countries like Angola. While the ARIMA model provides robust forecasting insights, future research could incorporate alternative modelling approaches, including Vector Autoregression (VAR) and Machine Learning techniques, to explore deeper causal relationships between FDI and economic growth. Additionally, sectoral analyses could offer more nuanced policy recommendations tailored to specific industries. By addressing these structural challenges, Angola can break the cycle of low FDI and position itself as a competitive investment destination in the long term.

RECOMMENDATIONS

Based on the findings of this study, which highlight the persistence of low Foreign Direct Investment (FDI) in Angola and its long-term implications, the following recommendations are proposed in terms of policy, programmatic interventions, and future research to break the cycle of low FDI and stimulate sustainable investment growth. Angola should enhance macroeconomic stability by implementing policies that curb inflation, stabilize exchange rates, and promote fiscal discipline. Persistent macroeconomic volatility discourages long-term foreign investments (World Bank, 2023). Establishing a transparent and predictable regulatory framework will boost investor confidence (Asiedu, 2006). The study findings indicate that Angola's FDI trends are heavily influenced by fluctuations in global oil prices. To mitigate this dependence, the government should diversify investment attraction efforts toward non-extractive industries, such as manufacturing, agriculture, and services, which have shown resilience in other African economies (UNCTAD, 2022). Implementing sector-specific investment incentives can encourage foreign firms to explore new industries.

Weak institutional frameworks, bureaucratic red tape, and corruption deter foreign investors. Strengthening anti-corruption measures, improving contract enforcement, and reducing excessive administrative procedures will enhance the ease of doing business (Borensztein et al., 1998). The establishment of a one-stop investment center could streamline processes and reduce barriers to entry for foreign firms. Infrastructure deficiencies particularly in transportation, energy, and digital connectivity remain a significant deterrent to foreign investors. Increased public and private sector investment in road networks, power supply, and telecommunications will improve Angola's attractiveness as an investment destination (Blonigen, 2005). To overcome resource constraints, Angola should leverage Public-Private Partnerships (PPPs) to fund large-scale infrastructure projects. Successful PPP models in Nigeria and South Africa demonstrate that well-structured collaborations can attract long-term FDI inflows (Dunning, 1993).

Angola should strengthen or establish Investment Promotion Agencies (IPAs) to actively market the country as an attractive investment destination. These agencies should provide market intelligence, investor support services, and incentives that align with international best practices (World Bank, 2023). Angola should leverage its membership in regional economic blocs, such as the Southern African Development Community (SADC) and the African Continental Free Trade Area (AfCFTA), to create a larger, more integrated market for investors. Increased regional trade and cross-border investments can serve as a catalyst for FDI growth (UNCTAD, 2022). While this study provides a macro-level analysis of FDI trends, future research should disaggregate FDI flows by sector to understand which industries attract investment and which remain underdeveloped (Borensztein et al., 1998). Further research should assess the impact of institutional reforms (e.g., tax incentives, legal reforms, and anti-corruption measures) on FDI inflows. Comparative analyses with other African economies could provide insights into best practices for fostering sustainable FDI growth. Future studies could explore alternative modelling approaches, such as vector autoregression (VAR), cointegration analysis, or machine learning techniques, to analyze long-term causal relationships between FDI and macroeconomic variables (Enders, 2015).

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APPENDICES

Appendix 1: Descriptive statistics

	Foreign direct investment, net inflows (% of GDP) FDI
Mean	3.171464
Median	1.849988
Maximum	40.16725
Minimum	-10.03838
Std. Dev.	9.048129
Skewness	1.912167
Kurtosis	8.099765
Jarque-Bera	74.49406
Probability	0
Sum	139.5444
Sum Sq. Dev.	3520.351
Observations	44

Appendix 2: Unit root test, FDI (in Level)

Null Hypothesis: FDI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.327541	0.0196
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI)
Method: Least Squares
Date: 02/01/25 Time: 20:44
Sample (adjusted): 1981 2023

Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-0.429011	0.128927	-3.327541	0.0019
C	1.344378	1.236731	1.087042	0.2834

R-squared	0.212637	Mean dependent var	-0.072786
Adjusted R-squared	0.193433	S.D. dependent var	8.477705
S.E. of regression	7.613750	Akaike info criterion	6.943184
Sum squared resid	2376.737	Schwarz criterion	7.025100
Log likelihood	-147.2785	Hannan-Quinn criter.	6.973392
F-statistic	11.07253	Durbin-Watson stat	2.286169
Prob(F-statistic)	0.001858		

Appendix 3: Results of the ARMA(1, 1) model

Dependent Variable: FDI
Method: ARMA Generalized Least Squares (Gauss-Newton)
Date: 02/01/25 Time: 20:17
Sample: 1980 2023
Included observations: 44
Convergence achieved after 13 iterations
Coefficient covariance computed using outer product of gradients
d.f. adjustment for standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.441795	3.651781	0.668659	0.5075
AR(1)	0.824179	0.146675	5.619097	0.0000
MA(1)	-0.381037	0.232423	-1.639411	0.1088

R-squared	0.363664	Mean dependent var	3.171464
Adjusted R-squared	0.332623	S.D. dependent var	9.048129
S.E. of regression	7.391700	Akaike info criterion	6.916615
Sum squared resid	2240.127	Schwarz criterion	7.038264
Log likelihood	-149.1655	Hannan-Quinn criter.	6.961728
F-statistic	11.71568	Durbin-Watson stat	2.042310
Prob(F-statistic)	0.000095		

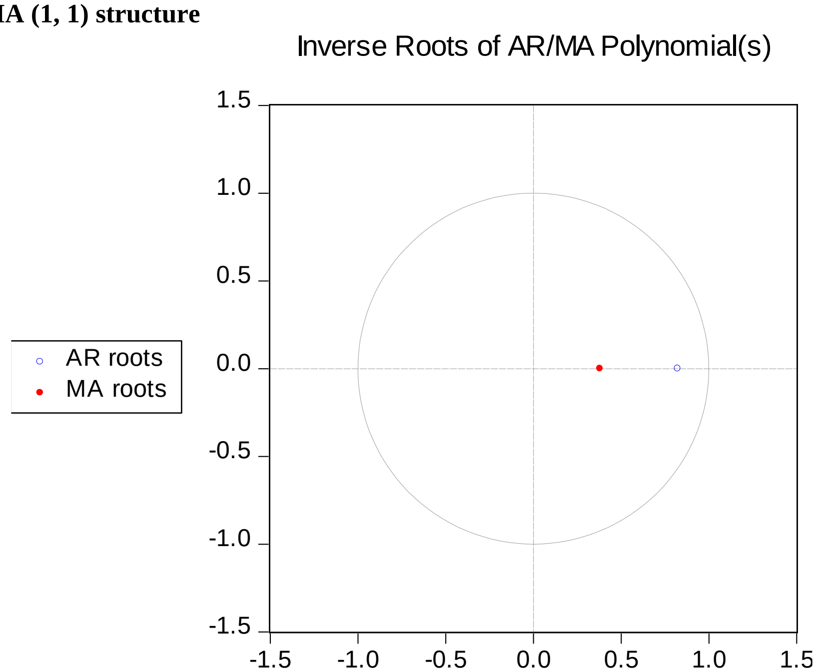
Inverted AR Roots	.82
Inverted MA Roots	.38

Appendix 4: Ljung-Box Q statistic/ test

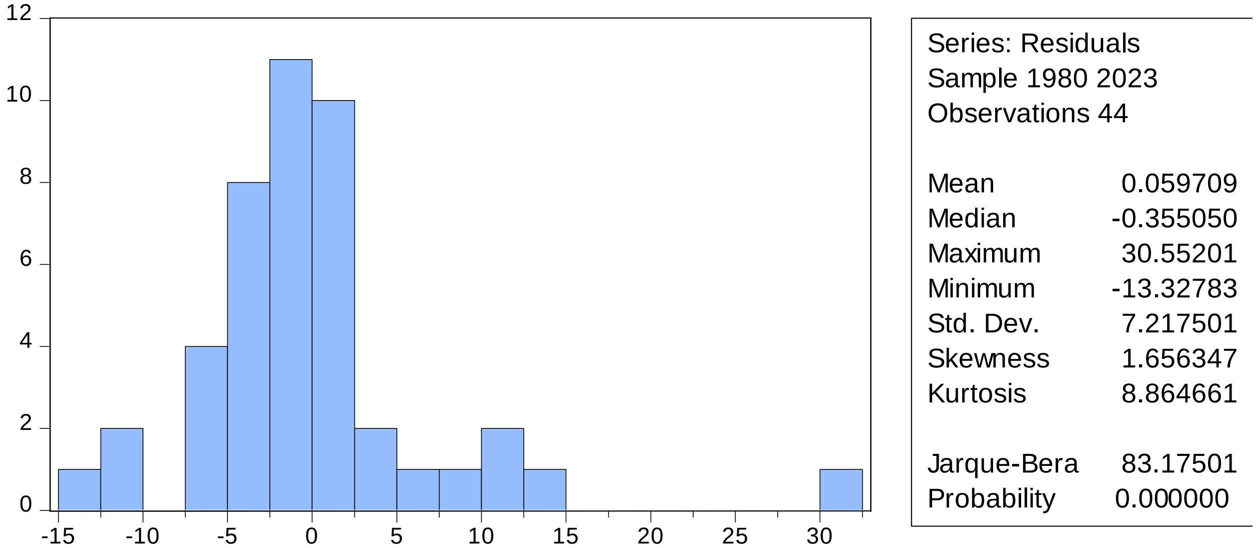
Date: 02/01/25 Time: 20:42
Sample: 1980 2023
Included observations: 44
Q-statistic probabilities adjusted for 2 ARMA terms

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. | . |	. | . |	1	-0.022	-0.022	0.0228	
. | . |	. | . |	2	0.069	0.068	0.2510	
.*| . |	.*| . |	3	-0.095	-0.093	0.7005	0.403
. |*. |	. |*. |	4	0.152	0.146	1.8721	0.392
. | . |	. | . |	5	0.046	0.063	1.9801	0.577
. | . |	.*| . |	6	-0.057	-0.087	2.1527	0.708
.*| . |	.*| . |	7	-0.097	-0.080	2.6652	0.751
. | . |	. | . |	8	0.051	0.050	2.8096	0.832
.*| . |	.*| . |	9	-0.148	-0.174	4.0833	0.770
. | . |	. | . |	10	0.025	0.020	4.1201	0.846
. | . |	. | . |	11	-0.053	0.016	4.2922	0.891
. | . |	. | . |	12	0.040	-0.005	4.3925	0.928
. | . |	. | . |	13	0.022	0.062	4.4251	0.956
.*| . |	. | . |	14	-0.067	-0.062	4.7269	0.966
. | . |	. | . |	15	-0.039	-0.062	4.8352	0.979
. |*. |	. |*. |	16	0.174	0.184	7.0333	0.933
. | . |	. | . |	17	0.069	0.065	7.3922	0.946
**| . |	**| . |	18	-0.214	-0.304	10.944	0.813
.*| . |	.*| . |	19	-0.191	-0.140	13.896	0.674
. | . |	. | . |	20	-0.039	-0.037	14.025	0.727

Appendix 5: ARMA (1, 1) structure



Appendix 6: Histogram of residuals



Appendix 7: Angola's FDI FORECAST results

YEAR	Foreign direct investment, net inflows (% of GDP) FDI	Foreign direct investment, net inflows (% of GDP) FDI_FORECAST
1980	0.630975	0.630975
1981	0.883707	0.883707
1982	2.086485	2.086485
1983	1.803662	1.803662
1984	1.095006	1.095006
1985	3.680138	3.680138
1986	3.308573	3.308573
1987	1.471968	1.471968
1988	1.493756	1.493756
1989	1.960442	1.960442
1990	-2.981429	-2.981429
1991	6.266631	6.266631
1992	3.466088	3.466088
1993	5.236863	5.236863
1994	3.837037	3.837037
1995	8.529489	8.529489
1996	2.398994	2.398994
1997	5.382318	5.382318
1998	17.12159	17.12159
1999	40.16725	40.16725
2000	9.623866	9.623866
2001	24.00908	24.00908
2002	11.40619	11.40619
2003	20.08101	20.08101
2004	9.329239	9.329239
2005	-3.526657	-3.526657
2006	-0.072001	-0.072001

2007	-1.368762	-1.368762
2008	1.896314	1.896314
2009	3.136661	3.136661
2010	-3.851111	-3.851111
2011	-2.704873	-2.704873
2012	-1.143768	-1.143768
2013	-5.380131	-5.380131
2014	2.690006	2.690006
2015	11.08134	11.08134
2016	-0.340243	-0.340243
2017	-10.03838	-10.03838
2018	-8.125891	-8.125891
2019	-5.780813	-5.780813
2020	-3.848264	-3.848264
2021	-6.548542	-6.548542
2022	-6.320564	-6.320564
2023	-2.49884	-2.49884
2024	NA	-2.09116
2025	NA	-1.294169
2026	NA	-0.637307
2027	NA	-0.095934
2028	NA	0.350253
2029	NA	0.717991
2030	NA	1.021073
2031	NA	1.270866
2032	NA	1.476741
2033	NA	1.646418
2034	NA	1.786262
2035	NA	1.901519
2036	NA	1.996511
2037	NA	2.074802
2038	NA	2.139327
2039	NA	2.192507
2040	NA	2.236338
2041	NA	2.272461
2042	NA	2.302234
2043	NA	2.326772

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Appendix 8: Graph showing FDI FORECAST results