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The Impact of Remittance on Economic Growth and Unemployment in Nigeria: Does Remittance Contribute to Dutch Disease Effects?

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Abstract

This study examines the impact of remittances on economic growth and unemployment in Nigeria, with a particular focus on potential Dutch Disease effects. Using an Autoregressive Distributed Lag (ARDL) model and time series data from 1980 to 2022, we investigate the short-run and long-run relationships between remittances and key economic indicators. Our findings reveal that remittances have a negative relationship with GDP growth and a positive relationship with unemployment in both the short and long run, contrary to some existing literature. We also find evidence of Dutch Disease effects, with remittances contributing to real exchange rate appreciation. The study shows that while domestic investment and trade openness positively influence GDP growth, foreign direct investment (FDI) has a negative relationship with unemployment. These results suggest that while remittances provide crucial support to many Nigerian households, they may have unintended negative macroeconomic consequences. The study contributes to a more nuanced understanding of remittances' role in Nigeria's economic development and highlights the need for targeted policies to maximize their benefits while mitigating potential drawbacks. Our findings have important implications for policymakers seeking to harness remittances for sustainable economic growth in Nigeria and similar developing economies.

Key Words: *Remittance, Nigeria, ARDL, Dutch-Disease effect, Unemployment.*

INTRODUCTION

Remittances have emerged as a crucial source of external financing for developing countries, with Nigeria standing out as one of the largest recipients in Sub-Saharan Africa (World Bank, 2023). These financial inflows, typically sent by migrant workers to their

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families in their home countries, have garnered significant attention from economists, policymakers, and researchers due to their potential to stimulate economic growth and alleviate poverty. However, the relationship between remittances and economic development is far from straightforward, often accompanied by complex dynamics and unintended consequences that merit careful examination. The magnitude of remittance inflows to developing countries has grown substantially over the past few decades. According to the World Bank (2023), global remittances to low- and middle-income countries reached $647 billion in 2022, surpassing foreign direct investment (FDI) and official development assistance (ODA) combined. This trend underscores the increasing importance of remittances as a source of external financing and highlights the need for a comprehensive understanding of their economic impacts.

Nigeria, with its large diaspora population spread across various countries, has consistently been among the top remittance-receiving countries in Africa. In 2022, Nigeria received an estimated $20.9 billion in remittances, accounting for approximately 4% of its Gross Domestic Product (GDP) (World Bank, 2023). This substantial inflow provides crucial support to many Nigerian households, contributing to improved living standards, increased consumption, and enhanced human capital development through investments in education and healthcare (Adenutsi, 2010). The potential benefits of remittances are numerous and well-documented in the literature. At the microeconomic level, remittances can help recipient households' smooth consumption, mitigate the effects of economic shocks, and invest in productive activities (Alpaslan et al., 2020). These inflows can also contribute to poverty reduction by providing a stable source of income for vulnerable populations. Moreover, remittances are often viewed as a more reliable and countercyclical form of external financing compared to other capital flows, such as FDI or portfolio investment, which tend to be more volatile and pro-cyclical (Ahmed & Martinez-Zarzoso, 2016).

At the macroeconomic level, remittances can potentially boost economic growth through various channels. They can increase the overall level of investment in the economy by providing capital for small businesses and entrepreneurial activities. Additionally, remittances can enhance financial sector development by increasing the pool of loanable funds and promoting financial inclusion among previously unbanked populations (Misati et al., 2019). The multiplier effect of remittance-driven consumption can also stimulate demand for goods and services, thereby contributing to overall economic growth. However, the impact of remittances on economic growth and development is not uniformly positive, and several challenges and potential drawbacks have been identified in the literature. One of the most significant concerns is the possibility that large remittance inflows may lead to symptoms associated with Dutch Disease, a phenomenon first observed in the Netherlands following the discovery of natural gas in the 1960s (Corden & Neary, 1982). We evaluated the trend of remittances and economic growth during the time period and the graph is shown in Figure 1. It is observed in Figure 1 that remittances remained stable over time while GDP was stochastic until 2004 where they both increased and began falling together from 2005.

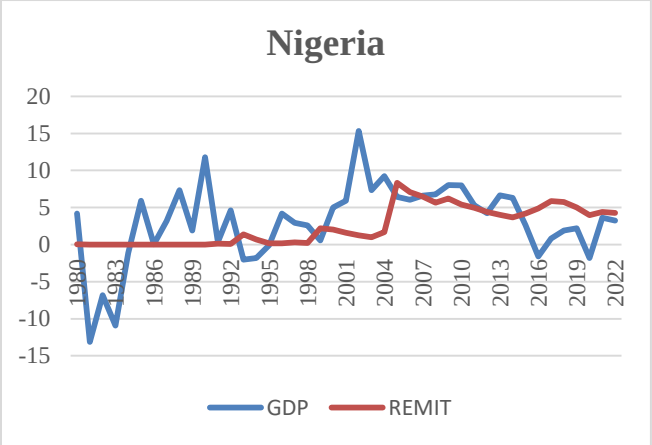

Figure 1; Trend of remittance and GDP in Nigeria

The concept of Dutch Disease refers to the paradoxical situation where an influx of foreign currency leads to a decline in a country's manufacturing and agricultural sectors. Traditionally associated with natural resource booms, recent studies have suggested that large remittance inflows may produce similar effects (Acosta et al., 2009). The mechanism through which this occurs is typically explained through two main channels: the spending effect and the resource movement effect.

The spending effect occurs when the increased income from remittances leads to higher demand for both tradable and non-tradable goods. As the prices of non-tradable goods are determined domestically, this increased demand can lead to inflation in the non-tradable sector. In contrast, the prices of tradable goods are set in international markets and remain relatively stable. This differential in price movements can result in an appreciation of the real exchange rate, making the country's exports less competitive in international markets. The resource movement effect, on the other hand, involves the reallocation of productive resources (such as labor and capital) from the tradable sector to the non-tradable sector. As the non-tradable sector expands due to increased domestic demand, it may draw resources away from the manufacturing and agricultural sectors, potentially leading to a contraction in these tradable sectors.

The potential link between remittances and Dutch Disease has been explored in various contexts, with mixed findings. Some studies have found evidence of Dutch Disease effects in countries with large remittance inflows (Lartey et al., 2012), while others have found no significant relationship or even positive effects on the tradable sector (Barajas et al., 2011). These conflicting results highlight the complexity of the relationship between remittances and economic outcomes, as well as the importance of country-specific factors in determining the ultimate impact of these inflows. The relationship between remittance inflows, economic growth, and unemployment in Nigeria presents a complex challenge that warrants in-depth investigation. While remittances have been recognized as a significant source of external financing for developing countries, their impact on economic outcomes remains a subject of debate. In the context of Nigeria, the potential for remittances to contribute to Dutch Disease symptoms adds another layer of complexity to this relationship.

The neoclassical growth model posits that remittances can boost capital accumulation, leading to increased productivity and economic growth (Solow, 1956). Contrarily, the Dutch Disease hypothesis suggests that large inflows of foreign currency,

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including remittances, can lead to real exchange rate appreciation and a decline in the competitiveness of the tradable sector (Corden & Neary, 1982). These competing theoretical perspectives highlight the need for empirical investigation to understand the net effect of remittances on Nigeria's economic growth. The impact of remittances on unemployment is equally complex. The job creation hypothesis suggests that remittances can reduce unemployment by providing capital for entrepreneurial activities and small business creation (Shapiro & Mandelman, 2016). However, the moral hazard hypothesis posits that remittances might increase unemployment by reducing the incentive to work among recipient households (Ihedimma & Opara, 2022). Understanding which of these effects dominates in the Nigerian context is crucial for effective policy formulation.

Nigeria presents a unique setting for this study due to its status as one of the largest remittance recipients in Africa and its ongoing struggles with economic diversification and unemployment. According to the World Bank (2023), Nigeria received an estimated $20.9 billion in remittances in 2022, accounting for approximately 4% of its GDP. Despite this significant inflow, Nigeria continues to face high unemployment rates, with the National Bureau of Statistics (2021) reporting an unemployment rate of 33.3% in the fourth quarter of 2020. The Nigerian economy's heavy reliance on oil exports makes it particularly vulnerable to Dutch Disease effects, potentially exacerbating the impact of remittance inflows on the country's economic structure. This vulnerability is evident in the persistent challenges Nigeria faces in diversifying its economy away from oil dependency (Adenuga et al., 2020). Understanding how remittances interact with these existing economic dynamics is crucial for developing effective policies to harness the benefits of remittances while mitigating potential negative consequences.

A review of the existing literature reveals several gaps that this study aims to address. Firstly, while numerous studies have examined the impact of remittances on economic growth and unemployment in various countries, relatively few have focused specifically on Nigeria, and even fewer have considered the potential for Dutch Disease effects in this context. Secondly, there is a lack of consensus in the existing literature regarding the net effect of remittances on economic outcomes. While some studies find positive effects of remittances on economic growth (Rehman et al., 2021; Asafo-Agyei, 2021), others find negative or insignificant effects (Amamoo-Otoo & Chi, 2020). This inconsistency in findings underscores the need for further research to understand the specific conditions under which remittances contribute positively or negatively to economic outcomes. Thirdly, most existing studies have focused on either the impact of remittances on economic growth or on unemployment, but few have examined these relationships simultaneously while also considering the potential for Dutch Disease effects. This study aims to provide a more comprehensive analysis by considering all three aspects; economic growth, unemployment, and Dutch Disease symptoms in a single framework.

Given these gaps in the literature and the unique context of Nigeria, this study aims to provide a comprehensive analysis of the impact of remittance inflows on economic growth and unemployment in Nigeria, with a particular focus on potential Dutch Disease effects. By addressing these gaps and employing advanced econometric techniques, this research seeks to contribute to a more refined understanding of the complex relationship between remittances and economic outcomes in Nigeria. The research objectives of the study are as to examine the impact of remittance inflows on economic growth in Nigeria, to investigate the relationship between remittance inflows and unemployment rates in Nigeria and to assess whether and to what extent remittance inflows contribute to Dutch Disease effects in Nigeria, focusing on real exchange rate appreciation and sectoral shifts in the economy.

The significance of this study on the impact of remittance inflows on economic growth and unemployment in Nigeria, with a focus on potential Dutch Disease effects, lies primarily in three key areas. Firstly, it addresses a critical gap in the literature by providing a comprehensive analysis of the complex relationship between remittances and economic outcomes in Nigeria, one of Africa's largest economies and a major recipient of remittances. By simultaneously examining the effects on economic growth, unemployment, and Dutch Disease symptoms, this research offers a more holistic understanding of the role of remittances in Nigeria's economic development. This comprehensive approach is crucial for policymakers seeking to develop strategies that maximize the benefits of remittances while mitigating potential negative consequences.

Secondly, the study's focus on Nigeria provides valuable insights into the dynamics of remittances in a context characterized by high unemployment, economic volatility, and heavy reliance on oil exports. Understanding how remittances interact with these existing economic challenges is essential for developing targeted policies that can leverage remittances for sustainable economic growth and diversification. Thirdly, by exploring the potential for Dutch Disease effects associated with remittance inflows, this research contributes to the broader debate on the double-edged nature of large foreign currency inflows in developing economies. The insights gained from this study can help policymakers design strategies to mitigate any negative effects on the competitiveness of the tradable sector while harnessing the positive aspects of remittance inflows. These three aspects of the study's significance highlight its potential to inform evidence-based policymaking and contribute to the broader literature on remittances and economic development in emerging economies.

In the following sections, we will present a detailed review of the relevant literature, outline our methodology for analyzing the relationship between remittances, economic growth, and unemployment in Nigeria, and discuss our findings and their implications for policy and future research.

LITERATURE REVIEW

Theoretical review

The study is anchored on two theories, Solow growth model and the Phillips' Curve Hypothesis.

Solow Growth Model

The Solow growth model, introduced by Robert Solow in 1956, represents a landmark contribution to economic theory. This model is firmly rooted in neo-classical principles and features a multifactor production function that incorporates both labor and capital as key inputs. According to Solow's original work, these factors are considered to be largely interchangeable within the context of the model. A fundamental assumption of the Solow model is that the production function exhibits positive returns to each input, but with diminishing marginal product. This means that as more of one input is added, holding the other constant, output

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increases but at a decreasing rate. The model also posits that if either capital (K) or labor (L) is zero, no output can be produced, which is mathematically expressed as F(K,0) = F(0,L) = F(0,0) = 0. Another crucial feature of the production function is its constant returns to scale, represented by the equation BY = F(BK, BL), where B is any positive scalar.

At its core, the Solow model integrates two key components: a production function and a capital accumulation equation. This integration allows for a dynamic analysis of economic growth over time. The model typically employs a Cobb-Douglas production function, which can be expressed as Y = F(K,L), where Y represents total production (or output), K stands for capital, and L denotes labor. In this context, capital stocks encompass a wide range of physical assets such as equipment, machinery, factories, infrastructure (like bridges), and land. Labor, on the other hand, represents the economically active population. One of the key insights of the Solow model is the relationship between savings and economic growth. The model predicts that an increase in the savings rate leads to higher levels of steady-state capital per worker. This, in turn, enhances labor productivity and increases output per worker. Consequently, for an economy to grow within this framework, there must be either an increase in capital stock through investment or an expansion of the labor force through population growth.

In the context of this model, investment in capital stock is primarily dependent on savings. This is where remittances can play a crucial role, particularly in developing economies. Remittances can be leveraged as an alternative to, or reinforcement of, domestic funds, thereby increasing the overall capital available for investment. This aspect of the model has significant implications for Sub-Saharan African (SSA) countries and other regions that receive substantial remittance inflows. Remittances have the potential to promote domestic savings and wealth building in SSA countries. As these funds flow into the economy, they can be channeled into productive investments, expanding the economy's productive capacity and ultimately leading to increases in GDP per capita. This process aligns with the Solow model's emphasis on capital accumulation as a driver of economic growth.

Moreover, the prospect of future remittance inflows can enhance the creditworthiness of domestic investors in remittance-receiving economies. This improved creditworthiness may result in lower costs of capital, as lenders may be more willing to extend credit at favorable terms when they perceive a steady stream of remittances as a form of income security. This reduction in the cost of capital can further stimulate investment and economic growth, creating a virtuous cycle that aligns with the predictions of the Solow model. In essence, the Solow growth model provides a theoretical framework that helps explain how remittances can contribute to economic growth through their impact on savings, investment, and capital accumulation. By augmenting domestic savings and potentially lowering the cost of capital, remittances can play a significant role in driving economic development, particularly in regions like Sub-Saharan Africa where domestic capital may be scarce. This theoretical underpinning highlights the potential importance of remittances as a tool for economic development and underscores the need for policies that effectively leverage these financial flows for sustainable economic growth.

Phillips' Curve Hypothesis

A correlation between the unemployment rate and the rate of change in money wages (inflation) can be seen in the Phillips curve. It shows that the unemployment rate is inversely related to the pace of increase in money earnings; it was first identified by the British economist A.W. Phillips. Phillips found an empirical association based on UK data showing that money pay rates rise at a slow rate when unemployment is high. Reason being, when demand for labor is low and unemployment is high, workers are hesitant to offer their services for less than what is currently being paid, which causes pay rates to decline relatively slowly. However, money wage rates tend to rise rapidly when the unemployment rate is low. For the simple reason that companies are likely to quickly bid up wage rates when demand for labor is high and the unemployment rate is low. Jhingan (2004) notes that the form of economic activity is the second factor that determines the inverse link between money pay rate and unemployment. Employers will bid up wages during an economic expansion because the unemployment rate declines and the demand for workers rises. On the other hand, when businesses are slow, there is less demand for workers and more people out of work, so companies are hesitant to raise wages. Instead, they will cut pay. But workers and unions will be reluctant to accept wage cuts during such situations. Consequently, firms are forced to terminate workers, thereby resulting to high rate of unemployment. The Traditional Phillips curve model is stated as follows:

$gW = gWT - f(UNEMP)$

but modified as follows

$\Delta UNEMP_t = \alpha_0 - \boldsymbol{\beta}_1 INF_t + \boldsymbol{\beta}_2 RGDP_t + \mu t$

Where;

gW: The growth rate of money wages

gWT: The trend rate of growth of money wages (equivalent to inflation)

UNEMP: The unemployment rate

INF: The inflation rate, representing changes in money wages

RGDP: Real Gross Domestic Product, indicating the level of business activity

Empirical Literature

Remittance and Economic growth

Numerous research studies have uncovered a positive correlation between remittances and economic growth. A study conducted by Rehman et al. (2021) delved into the impact of remittances and financial development on economic growth in six Western Balkan nations over a period spanning from 2000 to 2017. Employing the Generalized Method of Moments (GMM) technique, the researchers concluded that both financial development and remittances exerted a beneficial influence on economic growth in these countries. In a similar vein, Ekanayake and Moslares (2020) provided compelling evidence of a positive long-term effect of remittances on both economic growth and poverty reduction across 21 Latin American countries. Their findings underscore the potential of remittances as a tool for economic development and poverty alleviation in the region.

Sahoo et al. (2020) conducted a comprehensive analysis examining the relationship between remittance inflows, human development, and economic growth, alongside other macroeconomic indicators, over a 28-year period from 1990 to 2018. By utilizing Fully Modified Ordinary Least Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS) methodologies, the study

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established a robust long-term connection between remittances and human development. A more recent study by Kwaku et al. (2023) investigated the impact of various factors, including foreign direct investment, real exchange rate, remittances, and imports, on Ghana's economic growth. The researchers employed the Autoregressive Distributed Lag (ARDL) technique for their econometric analysis. Their findings revealed that foreign direct investment, real exchange rate, remittances, imports, and gross capital formation were cointegrated with economic growth in Ghana. Notably, remittances were found to have a positive and significant effect on Ghana's economic growth, both in the short and long term.

However, it is important to note that not all studies have yielded uniformly positive results. Amamoo-Otoo and Chi (2020) conducted research to evaluate the impact of emigration and remittances on Ghana's economic growth, specifically addressing the conflicting findings in existing empirical studies regarding the contribution of workers' remittances to economic growth. Their study examined time series data from 1990 to 2018 and employed a regression model that incorporated control variables such as trade, gross fixed capital formation, and foreign direct investment. Contrary to some other studies, their results indicated that emigration and remittances had a detrimental impact on economic growth in Ghana. Similarly, a study by Oteng-Abayie et al. (2020) aimed to analyze the influence of inward remittances on economic growth in Ghana and explore the direction of causality between these two variables. The researchers utilized the ARDL estimation approach to examine the relationship between remittances and economic growth, while also employing the traditional Granger causality test to investigate the direction of causation. Using annual data spanning from 1970 to 2016, their analysis yielded mixed results. The study found that remittances had a negative long-run impact on GDP but a positive effect on economic growth in the short run.

Remittance and Unemployment

The relationship between remittances and unemployment has been a subject of considerable empirical investigation, yielding diverse and sometimes conflicting results. This complex relationship has attracted the attention of researchers seeking to understand the economic implications of international money transfers on labor markets in various countries.

In Nigeria, Okeke (2021) conducted a comprehensive study examining the impact of international migrant remittances on the country's unemployment rate. Recognizing the critical importance of reducing unemployment as a key macroeconomic objective, the researcher developed an unemployment rate model and employed the sophisticated two-stage least squares (2SLS) method to analyze the effects of remittances. The study utilized a range of statistical tests, including t-tests, F-tests, and an error correction model, to evaluate the estimated results and establish long-term linear relationships between variables. Using time series data from secondary sources, the findings revealed a negative effect of international remittances on unemployment in Nigeria. This suggests a unidirectional causality between remittances and unemployment, without feedback, implying that an increase in remittances may contribute to a reduction in unemployment rates.

Shifting focus to Ghana, Saani et al. (2023) investigated the impact of remittances on unemployment, with a particular emphasis on gender perspectives. Their study employed the Autoregressive Distributed Lag (ARDL) model to analyze time-series data spanning from 1990 to 2021. Similar to Okeke's study, they conducted various statistical tests to evaluate relationships between variables. The research uncovered a long-run relationship between remittances, inflation, foreign direct investment (FDI), exports, capital formation, and the unemployment rate. Interestingly, their findings indicated a positive correlation between remittances and unemployment, with a notably pronounced effect on female unemployment. This gender-specific impact highlights the complex and potentially uneven effects of remittances on different segments of the labor force.

In Bangladesh, Biplob and Siddiqee (2024) examined the impact of both foreign direct investment (FDI) and foreign remittances on the unemployment rate over a three-decade period from 1991 to 2020. The researchers utilized the ARDL technique to analyze both long-run and short-run estimations of the relationships between these variables. The ARDL Bound test model was employed to achieve the primary research objectives. Their findings revealed a positive and statistically significant association between FDI, foreign remittances, and the unemployment rate in Bangladesh, both in the long run and short term. This suggests that increases in FDI and remittances may, counterintuitively, be associated with higher unemployment rates in the Bangladesh context.

Orji et al. (2018) conducted a study in Nigeria with the aim of analyzing the impact of various forms of foreign capital inflows, including Foreign Direct Investment, Foreign Portfolio Investment, and Remittances, on unemployment. The researchers employed the Auto-Regressive Distributed Lag-Unrestricted Error Correction Methodology (ARDL-UECM) to estimate the relationships between these variables. Their findings painted a nuanced picture: foreign direct investment, foreign private investment, and trade openness were found to have a negative impact on the unemployment rate in Nigeria, suggesting these forms of capital inflow may contribute to job creation. However, remittances and real exchange rates showed a positive impact on unemployment, indicating that increases in these factors may be associated with higher unemployment rates.

Remittance and Dutch Disease

The potential for remittances to induce Dutch Disease effects has been a subject of considerable empirical investigation in recent years. Several studies have explored this phenomenon, providing valuable insights into the complex relationship between remittance inflows and macroeconomic outcomes in developing and transition economies. Acosta et al. (2009) conducted a comprehensive study using a panel dataset encompassing 109 developing and transition countries over the period from 1990 to 2003. Their findings revealed compelling evidence that increasing levels of remittances generate spending effects, leading to real exchange rate appreciation. Additionally, they observed resource movement effects that tend to favor the non-tradable sector at the expense of tradable goods production. These results suggest that remittances can indeed contribute to symptoms characteristic of Dutch Disease. Building on this research, Lartey et al. (2012) employed a similar panel dataset, also covering 109 developing and transition countries from 1990 to 2003, to examine the intricate relationship between remittances, exchange rate regimes, and Dutch Disease. Their analysis corroborated the findings of Acosta et al., demonstrating that rising remittances lead to real exchange rate appreciation and trigger a resource shift from the tradable to the non-tradable sector. Importantly, they observed that these effects were more pronounced under fixed exchange rate regimes,

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highlighting the role of monetary policy in mediating the impact of remittances on the economy.

Focusing on the Indian context, Shaheen et al. (2023) conducted a detailed assessment of the impact of workers' remittances and other economic variables on the Real Effective Exchange Rate (REER) of the Indian currency. Their study utilized annual time series data spanning from 1981 to 2018 and employed the Autoregressive Distributed Lag (ARDL) bounds test to analyze the long-run association of variables. The researchers used ARDL estimation to investigate the presence of Dutch Disease in the Indian economy caused by workers' remittances. Additionally, they conducted an Error Correction Model test to observe the speed at which the REER converged to its long-run equilibrium path over successive periods. Their findings indicated that remittance inflows appreciated the REER in both the long and short run, suggesting a positive impact on the exchange rate. The study provided evidence of Dutch Disease effects in the Indian economy due to the inflows of workers' remittances. Interestingly, they found that Terms of Trade was the only variable that consistently depreciated the REER in both the long and short run. In the Nigerian context, Adamu (2013) investigated the Dutch Disease effects of remittances using time series data from 1970 to 2010. Employing a Vector Autoregression (VAR) model, the study found evidence of both spending and resource movement effects, suggesting that remittances may indeed contribute to Dutch Disease symptoms in Nigeria. This research provides valuable insights into the specific dynamics of remittance impacts in the Nigerian economy.

A thorough review of the existing literature reveals several significant gaps that warrant further investigation. Firstly, while numerous studies have examined the impact of remittances on economic growth and unemployment in various countries, there is a notable scarcity of research focusing specifically on Nigeria, particularly in relation to potential Dutch Disease effects. This gap in the literature underscores the need for more targeted research on the Nigerian context. Secondly, there is a lack of consensus in the existing literature regarding the net effect of remittances on economic outcomes. Some studies, such as those by Rehman et al. (2021) and Asafo-Agyei (2021), find positive effects of remittances on economic growth. In contrast, others, like Amamoo-Otoo & Chi (2020), report negative or insignificant effects. This inconsistency in findings highlights the need for further research to elucidate the specific conditions under which remittances contribute positively or negatively to economic outcomes. Such research could provide valuable insights for policymakers seeking to maximize the benefits of remittance inflows while mitigating potential negative consequences.

Thirdly, most existing studies have tended to focus on either the impact of remittances on economic growth or on unemployment, but few have examined these relationships simultaneously while also considering the potential for Dutch Disease effects. This compartmentalized approach may overlook important interactions between these economic phenomena. There is a clear need for more comprehensive analyses that consider all three aspects - economic growth, unemployment, and Dutch Disease symptoms - within a single analytical framework. Such an integrated approach could provide a more nuanced understanding of the complex ways in which remittances influence various aspects of the economy.

METHODOLOGY

Theoretical framework

The Phillips Curve, developed by economist A.W. Phillips, posits an inverse relationship between inflation and unemployment. This theory suggests that as an economy grows, inflation rises, which should lead to increased job creation and reduced unemployment. Remittances play a crucial role in this framework, particularly for developing economies characterized by low income and savings. These financial inflows serve as a source of foreign capital, stimulating investment in the recipient country. According to the theory, this influx of capital drives economic growth, which in turn should decrease unemployment rates.

For an economy to grow based on the Solow growth model, there must be an increment in the inventories of capital via investment and supply of labor through population expansion. Investment in capital stock depends on savings and remittance can be exploited as alternative or to strengthen the domestic fund hence increase in capital funds. Remittances can promote domestic savings and wealth building. This expands productive capacity and GDP per capita.

Model Specification

The study employs the Autoregressive Distributed Lag (ARDL) model, proposed by Pesaran et al. (2001), for its econometric analysis. This model is specified with GDP growth rate and unemployment rate as dependent variables, while key independent variables include capital formation, remittances, trade, inflation, foreign direct investment, and population growth. Appropriate lags are incorporated to account for delayed effects, allowing for a nuanced examination of the economic relationships under investigation.

The analytical process begins with a descriptive statistical analysis of all variables, followed by stationarity tests using the Augmented Dickey-Fuller (ADF) method (Dickey & Fuller, 1979). This crucial step ensures the validity of subsequent analyses by identifying any unit roots in the data. The bound cointegration test is then applied to assess the long-run relationships among the variables. Using the bound F-statistic, the alternative hypothesis that there is level cointegration was tested against the null hypothesis that there is no level cointegration. We accept the alternative that there is long cointegration between the series and reject the null hypothesis if the estimated F-statistic is larger than the critical F-statistic of the upper bound. Upon confirmation of long-run cointegration, the study proceeds to estimate the conditional ARDL long-run model. In terms of function, our empirical model can be found below:

GDP = f (REMIT, INV, INF, FDI, POP G, TRADE)

UNEMP = f (REMIT, INV, INF, FDI, POP G, TRADE)

REER = f (REMIT, INV, INF, FDI, POP G, TRADE)

In these models, REMIT represents personal remittances received, INV denotes domestic investment, POP G is the population growth rate, INF stands for inflation, FDI represents foreign direct investment, TRADE measures trade openness, and REER (real effective exchange rate) is included to assess potential Dutch disease effects, as noted by Shaheen et al. (2023) and Acosta et al. (2009).The following is a linear form of equation 1 and 2, which can be expressed as:

$$GDP_t = \alpha_0 + \alpha_1 REMIT_t + \alpha_2 INV_t + \alpha_3 INF_t + \alpha_4 FDI_t + \alpha_5 POPG_t + \alpha_6 TRADE_t + \varepsilon_t \quad (4)$$

$$UNEMP_t = \alpha_0 + \alpha_1 REMIT_t + \alpha_2 INV_t + \alpha_3 INF_t + \alpha_4 FDI_t + \alpha_5 POPG_t + \alpha_6 TRADE_t + \varepsilon_t \quad (5)$$

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$$REER_t = \alpha_0 + \alpha_1 REMIT_t + \alpha_2 INV_t + \alpha_3 INF_t + \alpha_4 FDI_t + \alpha_5 POPG_t + \alpha_6 TRADE_t + \varepsilon_t \quad (6)$$

The ARDL model is preferred for this analysis due to its ability to simultaneously estimate short-run and long-run effects, unlike conventional cointegration models such as Engle-Granger (Engle & Granger, 1987), Johansen test (Johansen & Juselius, 1990), and Phillip-Ouliaris test (Işık, 2013). It can handle variables with different integration orders and produces reliable results for small sample sizes. Additionally, the inclusion of lags in the ARDL model addresses potential endogeneity issues. These advantages, as noted by researchers like Sam et al. (2019), Amin et al. (2020), and Wang et al. (2021), make ARDL a robust choice for this economic analysis. The model to be estimated, an Autoregressive Distributed Lag model, is defined as follows:

$$\Delta GDP_t = \beta_0 + \beta_1 GDP_{t-1} + \beta_2 REMIT_{t-1} + \beta_3 INV_{t-1} + \beta_4 INF_{t-1} + \beta_5 FDI_{t-1} + \beta_6 POPG_{t-1} + \beta_7 TRADE_{t-1} \quad (7)$$

$$+ \sum_{r=1}^{p} \gamma_1 \Delta GDP_{t-r} + \sum_{r=1}^{q} \gamma_2 \Delta REMIT_{t-r} + \sum_{r=1}^{q} \gamma_3 \Delta INV_{t-r} + \sum_{r=1}^{q} \gamma_4 \Delta INF_{t-r} + \sum_{r=1}^{q} \gamma_5 \Delta FDI_{t-r} + \sum_{r=1}^{q} \gamma_6 \Delta POPG_{t-r} + \sum_{r=1}^{q} \gamma_7 \Delta TRADE_{t-r} + \mu_t$$

$$\Delta UNEMP_t = \beta_0 + \beta_1 UNEMP_{t-1} + \beta_2 REMIT_{t-1} + \beta_3 INV_{t-1} + \beta_4 INF_{t-1} + \beta_5 FDI_{t-1} + \beta_6 POPG_{t-1} + \beta_7 TRADE_{t-1} \quad (8)$$

$$+ \sum_{r=1}^{p} \gamma_1 \Delta UNEMP_{t-r} + \sum_{r=1}^{q} \gamma_2 \Delta REMIT_{t-r} + \sum_{r=1}^{q} \gamma_3 \Delta INV_{t-r} + \sum_{r=1}^{q} \gamma_4 \Delta INF_{t-r} + \sum_{r=1}^{q} \gamma_5 \Delta FDI_{t-r} + \sum_{r=1}^{q} \gamma_6 \Delta POPG_{t-r} + \sum_{r=1}^{q} \gamma_7 \Delta TRADE_{t-r} + \mu_t$$

$$\Delta REER_t = \beta_0 + \beta_1 REER_{t-1} + \beta_2 REMIT_{t-1} + \beta_3 INV_{t-1} + \beta_4 INF_{t-1} + \beta_5 FDI_{t-1} + \beta_6 POPG_{t-1} + \beta_7 TRADE_{t-1} \quad (9)$$

$$+ \sum_{r=1}^{p} \gamma_1 \Delta REER_{t-r} + \sum_{r=1}^{q} \gamma_2 \Delta REMIT_{t-r} + \sum_{r=1}^{q} \gamma_3 \Delta INV_{t-r} + \sum_{r=1}^{q} \gamma_4 \Delta INF_{t-r} + \sum_{r=1}^{q} \gamma_5 \Delta FDI_{t-r} + \sum_{r=1}^{q} \gamma_6 \Delta POPG_{t-r} + \sum_{r=1}^{q} \gamma_7 \Delta TRADE_{t-r} + \mu_t$$

Equation 7, 8 and 9 have Δ as the difference operator, β_0 as the intercept term, β_1 to β_7 as long-run coefficients, and γ_1 to γ_7 as short-run coefficients. The GDP growth, the REER and the unemployment rate lags are reported by p, the regressor lags are represented by q, and the error residuals are reported by μ_t. On the other hand, both short- and long-term relationships would be stated if the bounds test indicates cointegration among the variables. Therefore, the short-run coefficients are determined by estimating an error correction model (ECM). As a result, the ECM equation is given as follows:

$$\Delta GDP_t = \sum_{j=1}^{p} \gamma_1 \Delta GDP_{t-j} + \sum_{j=1}^{q} \gamma_2 \Delta REMIT_{t-j} + \sum_{j=1}^{q} \gamma_3 \Delta INV_{t-j} + \sum_{j=1}^{q} \gamma_4 \Delta INF_{t-j}$$

$$+ \sum_{j=1}^{q} \gamma_5 \Delta FDI_{t-j} + \sum_{j=1}^{q} \gamma_6 \Delta POPG_{t-j} + \sum_{j=1}^{q} \gamma_7 \Delta TRADE_{t-j} + \varphi ECM_{t-1} + \mu_t \quad (10)$$

$$\Delta UNEMP_t = \sum_{j=1}^{p} \gamma_1 \Delta UNEMP_{t-j} + \sum_{j=1}^{q} \gamma_2 \Delta REMIT_{t-j} + \sum_{j=1}^{q} \gamma_3 \Delta INV_{t-j} + \sum_{j=1}^{q} \gamma_4 \Delta INF_{t-j}$$

$$+ \sum_{j=1}^{q} \gamma_5 \Delta FDI_{t-j} + \sum_{j=1}^{q} \gamma_6 \Delta POPG_{t-j} + \sum_{j=1}^{q} \gamma_7 \Delta TRADE_{t-j} + \varphi ECM_{t-1} + \mu_t \quad (11)$$

$$\Delta REER_t = \sum_{j=1}^{p} \gamma_1 \Delta REER_{t-j} + \sum_{j=1}^{q} \gamma_2 \Delta REMIT_{t-j} + \sum_{j=1}^{q} \gamma_3 \Delta INV_{t-j} + \sum_{j=1}^{q} \gamma_4 \Delta INF_{t-j}$$

$$+ \sum_{j=1}^{q} \gamma_5 \Delta FDI_{t-j} + \sum_{j=1}^{q} \gamma_6 \Delta POPG_{t-j} + \sum_{j=1}^{q} \gamma_7 \Delta TRADE_{t-j} + \varphi ECM_{t-1} + \mu_t \quad (12)$$

The coefficient of variation, or φ, represents the rate of adjustment to the long-run equilibrium and should be substantially negative. The error correction term (ECM) in the given model is responsible for the long run representation (Darko, 2016).

Empirical Data

The data for this study was collected from two primary sources: the World Bank's World Development Indicators (WDI) and the International Monetary Fund (IMF) economic databases. These sources are widely recognized for their comprehensive and reliable economic data, making them suitable for our analysis of remittances, economic growth, unemployment, and Dutch Disease effects in Nigeria. The dataset spans from 1980 to 2022, providing a 43-year time series that allows for a robust analysis of long-term trends and relationships between the variables. This extended time frame is particularly valuable as it covers periods of significant economic changes in Nigeria, including oil booms, economic reforms, and global financial crises, allowing us to examine the impact of remittances under varying economic conditions.

The variables included in this study are carefully selected to address our research objectives and hypotheses. GDP is included as the primary measure of economic growth, providing a comprehensive indicator of the overall economic performance of Nigeria. Remittances, our key independent variable, capture the inflows of foreign currency from the Nigerian diaspora, which is crucial for examining its impact on economic growth, unemployment, and potential Dutch Disease effects. FDI is included as a control variable and to compare its effects with those of remittances, allowing us to distinguish between the impacts of different types of capital inflows on the economy.

The Real Effective Exchange Rate (REER) is included as a measure of Dutch Disease effects, as an appreciation in the REER can indicate a loss of competitiveness in the tradable sector, which is a key symptom of Dutch Disease. Inflation is included to control for macroeconomic stability, as high inflation can affect economic growth and unemployment. Domestic investment is included to examine how remittances might affect or interact with domestic investment, allowing us to explore whether remittances complement or substitute domestic investment. Population growth is included as a control variable as it can affect both economic growth and unemployment rates, which is particularly relevant in the Nigerian context given the country's high population growth rate. Trade openness is included to control for the effects of international trade on the economy and is particularly relevant when examining potential Dutch Disease effects. Finally, the unemployment rate is included as one of our dependent variables, allowing us to examine how remittances affect the labor market.

RESULTS AND DISCUSSION

The paper presents the ARDL results obtained from the empirical analysis in this section. These results are built on the descriptive statistics, unit root tests, and the cointegration bound test, which serve as the foundation of the model.

Descriptive Statistics

Table 1 presents summary statistics for various economic indicators, offering insights into their central tendencies, variability, and distribution characteristics. Foreign Direct Investment (FDI) shows a relatively low mean of 1.18, with a standard deviation of 1.01, indicating moderate variability. The positive skewness suggests a tendency towards higher values in some cases. Gross Domestic Product (GDP) exhibits a higher mean

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of 3.07, but with considerable variability as evidenced by its standard deviation of 5.26. The negative skewness of GDP implies some lower outliers, potentially representing periods of economic downturn. Inflation (INF) stands out with its high mean of 20.95 and an extremely large standard deviation of 33.94. This, combined with its high positive skewness and kurtosis, indicates significant fluctuations and potential periods of hyperinflation in the dataset. Such extreme values could have substantial impacts on other economic factors. Domestic Investment (INV) shows a robust mean of 36.77 with a standard deviation of 20.21, suggesting considerable but not extreme variability. The slight positive skewness indicates a tendency towards higher investment levels in some instances.

Table 1. Summary Statistics of the Variables

Variables	Mean	Std. Dev.	Skewness	Kurtosis	Observations
FDI	1.182475	1.007559	0.593981	3.746901	43
GDP	3.073412	5.258717	-0.85562	4.855587	43
INF	20.94896	33.94137	4.870023	28.45614	43
INV	36.76763	20.20674	1.11214	3.760224	43
POP_G	2.622832	0.142482	1.025902	4.467559	43
REER	150.3353	115.0588	1.850411	5.726609	43
REMIT	2.503262	2.548413	0.51622	1.870276	43
TRADE	2.620125	5.389262	1.297368	4.876919	43
UNEMP	3.963023	0.507221	2.175476	6.707204	43

Population Growth Rate demonstrates remarkable stability with a mean of 2.62 and a low standard deviation of 0.14. This consistency suggests steady demographic changes over the observed period. Similarly, the Unemployment Rate shows relatively low variability around its mean of 3.96, although its high positive skewness indicates some periods of higher unemployment. The Real Effective Exchange exhibits the highest mean at 150.34, with substantial variability as shown by its standard deviation of 115.06. Its positive skewness and high kurtosis suggest periods of significant currency appreciation relative to trading partners. Personal Remittances Received and Trade Openness both show moderate means and variability, with positive skewness indicating occasional higher values. These factors could play important roles in the overall economic landscape, potentially influencing other variables like GDP and FDI. This dataset reveals a complex economic picture with some stable elements like population growth, alongside highly volatile factors such as inflation and exchange rates.

Stationarity Test

Regression analysis using non-stationary series can lead to inaccurate results, rendering them unsuitable for analysis, forecasting, or policymaking, as noted by Bashar (2015) and Emeka and Aham (2016). To address this issue, the Augmented Dickey-Fuller (ADF) test was employed to determine the stationarity of the series. The results of the unit root test, presented in Table 2, reveal that when the intercept is considered, only inflation, unemployment, FDI, and GDP were stationary at levels. The remaining variables became stationary after first differencing. This indicates the absence of I(2) series among the variables, with only I(0) and I(1) series present. Given this mix of integration orders, the ARDL approach is deemed most appropriate for the analysis.

Table 2. Unit root test results (ADF)

	Level Form		First Differenced	
Variable	**Intercept**	**P-value**	**Intercept**	**P-value**
GDP	-3.4196	**0.06689**	-4.7662	**0.0000**
INV	-2.3484	0.4361	-4.0177	**0.01852**
REMIT	-2.0844	0.5404	-3.7021	**0.03694**
TRADE	-1.6254	0.7217	-4.6477	**0.0000**
INF	-3.4647	**0.06011**	-4.6858	**0.0000**
FDI	-4.14385	**0.0023**	-10.0315	**0.0000**
REER	-2.00635	0.2831	-4.47396	**0.0009**
UNEMP	-4.01175	**0.0033**	-2.34668	**0.0163**
POP.G	-0.51131	0.9769	-5.2929	**0.0000**

Bold values indicate significance

Bound Test for Cointegration

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The bound test for cointegration was conducted after confirming the stationarity of the series, a necessary step for implementing the ARDL model. Table 3 presents the results of this test, showing an F-statistic value of 6.533. This F-statistic exceeds the upper bound, I(1), at the 5% significance level. As a result, we reject the null hypothesis and accept the alternative hypothesis, confirming the existence of long-run joint cointegration among the variables. This finding supports the use of the ARDL model for further analysis of the long-run relationships between the variables.

Table 3. Bound Test results (Pesaran, Shin, and Smith (2001) bounds test)

H_0: No levels relationship

Test Statistic	Value	Sig	I(0)	I(1)
F-Stat	6.533	10%	1.95	3.06
K	8	5%	2.22	3.39
		2.50%	2.48	3.7
		1%	2.49	4.1

Long Run Remittance impact on GDP growth

The analysis reveals an intriguing negative relationship between personal remittances and GDP growth, with a coefficient of -1.159. This indicates that a 1 percentage point increase in remittances is associated with a 1.159 percentage point decrease in GDP growth. While this contradicts some studies (Rehman et al., 2021; Kwaku et al., 2023), it aligns with other research (Amamoo-Otoo & Chi, 2020; Oteng-Abayie et al., 2020). The negative long run relationship could emanate from several reasons. One of the primary concerns is the potential reduction in labor force participation. Acosta et al. (2018) found that remittances can create a disincentive for recipients to engage in the formal labor market, particularly among women and youth. This "moral hazard" effect occurs when remittances are viewed as a substitute for labor income, leading to reduced overall economic productivity. The resulting decrease in labor supply can have significant negative impacts on economic growth, especially in countries where remittances constitute a large portion of national income.

Another critical factor is the potential for remittances to induce "Dutch Disease" effects. Lartey et al. (2012) demonstrated that large inflows of remittances can lead to an appreciation of the real exchange rate, which in turn can harm the competitiveness of a country's exports. This effect is particularly problematic for economies that rely heavily on export-oriented industries for growth. The appreciation of the domestic currency can lead to a contraction in the tradable goods sector, potentially slowing overall economic growth. Remittances may also contribute to brain drain, as argued by Docquier et al. (2020). The prospect of sending money back home can incentivize skilled individuals to emigrate, leading to a loss of human capital in the remittance-receiving country. This exodus of skilled workers can have long-term negative effects on productivity and innovation, crucial drivers of economic growth. While remittances may provide short-term financial benefits, the long-term loss of human capital can outweigh these gains.

Taking the control variables into consideration, inflation demonstrates a significant negative relationship with GDP, with a coefficient of -0.051. This implies that a 1 percentage point increase in inflation is associated with a 0.051 percentage point decrease in GDP growth. Domestic investment emerges as a crucial positive driver of GDP growth, with a coefficient of 0.183. This suggests that a 1 percentage point increase in domestic investment is associated with a 0.183 percentage point increase in GDP growth. This strong positive relationship corroborates recent findings by Nguyen et al. (2021), who emphasized the critical role of domestic investment in driving economic growth in developing countries. Trade openness shows a strong positive impact on GDP growth, with a coefficient of 0.436. This suggests that a 1 percentage point increase in trade openness is associated with a 0.436 percentage point increase in GDP growth.

Population growth exhibits a positive relationship with GDP growth, with a coefficient of 9.946. This implies that a 1 percentage point increase in population growth rate is associated with a 9.946 percentage point increase in GDP growth. This result aligns with recent research by Atanda et al. (2022). Interestingly, Foreign Direct Investment (FDI) shows a negative but statistically insignificant relationship with GDP growth. This non-significance is consistent with recent meta-analyses like that of Iamsiraroj (2016), who found that the impact of FDI on growth can vary greatly depending on the host country's characteristics and absorptive capacity. The Real Effective Exchange Rate (REER) shows a negative but insignificant relationship with GDP growth. Lastly, the unemployment rate shows a negative but statistically insignificant relationship with GDP growth. While this directionally aligns with Okun's Law, the lack of significance suggests that in this context, other factors may be more important in driving GDP growth.

Long Run Remittance impact on Unemployment

In the long-run, remittances show a positive and highly significant relationship with unemployment with coefficient of 0.125572. This suggests that a 1 percentage point increase in remittances is associated with a 0.125572 percentage point increase in unemployment. This finding supports research Orji et al. (2018) and Saani et al. (2023), who found that remittances can increase reservation wages and reduce labor force participation in Nigeria and Ghana respectively. The result implies that remittances might be creating a disincentive to work in Nigeria. As remittance-receiving households experience an increase in non-labor income, they may reduce their job search efforts or withdraw from the labor force entirely, leading to higher unemployment rates. Another potential mechanism is the Dutch disease effect, as explored by Acosta et al. (2018). Large remittance inflows can lead to an appreciation of the real exchange rate, which may harm the competitiveness of the tradable sector. This can result in a contraction of export-oriented industries, potentially leading to job losses and increased unemployment in these sectors.

FDI shows a negative relationship with unemployment, with a coefficient of -0.10974. This suggests that a 1 percentage point increase in FDI is associated with a 0.10974 percentage point decrease in unemployment. Inflation has a positive but statistically insignificant relationship with

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unemployment. This weak positive relationship doesn't strongly support or contradict the Phillips curve theory, which suggests an inverse relationship between inflation and unemployment. Bhattarai (2016) found that the inflation-unemployment relationship can vary across countries and time periods, which may explain the insignificant result. Domestic investment shows a positive but statistically insignificant relationship with unemployment (coefficient: 0.002781, p-value: 0.5681). This result is somewhat surprising, as increased domestic investment is typically expected to reduce unemployment.

Trade Openness demonstrates a negative and statistically significant relationship with unemployment with a coefficient of -0.02815. This indicates that a 1 percentage point increase in trade openness is associated with a 0.02815 percentage point decrease in unemployment. This finding aligns with studies like Felbermayr et al. (2011), who found that trade openness can reduce structural unemployment. The result suggests that increased trade opportunities may create more jobs than it displaces in Nigeria. Population Growth exhibits a positive and significant relationship with unemployment with coefficient of 1.62753. This indicates that a 1 percentage point increase in population growth is associated with a 1.62753 percentage point increase in unemployment. This result is interesting and somewhat confirms the common notion that population growth increases unemployment.

Long Run Remittance Relationship with Dutch Disease

In the long-run, remittances revealed a positive relationship with REER with coefficient of 4.166839, suggesting that increased remittances tend to appreciate the real exchange rate. This aligns with recent findings by Shaheen et al., (2023) and Adamu (2013), who observed that remittances lead to real exchange rate appreciation in India and Nigeria respectively, potentially contributing to Dutch disease effects. This is because where remittances increase the purchasing power of recipient households there may be the presence of spending effect (Acosta et al., 2009). This leads to higher demand for both tradable and non-tradable goods, but since the prices of tradables are set internationally, the primary effect is an increase in the relative price of non-tradables, causing real exchange rate appreciation.

Foreign Direct Investment (FDI) shows a significant negative relationship with REER, indicating that increased FDI leads to real exchange rate depreciation. This finding aligns with some recent studies (Combes et al., 2022) but contradicts others (Ibhagui, 2017), highlighting the complex nature of FDI's impact. Domestic investment demonstrates a significant positive relationship with REER, implying that increased domestic investment leads to real exchange rate appreciation. This is consistent with recent literature such as Tran and Vo (2020), who found that capital formation, including domestic investment, contributes to real exchange rate appreciation in developing Asian countries. While Inflation and Trade Openness show negative relationships with REER, these are not statistically significant. The positive but insignificant relationship between population growth and REER is interesting. While demographic factors are often overlooked in exchange rate studies, recent research by Hassan et al. (2021) suggests that demographic changes can influence real exchange rates through their impact on savings and investment patterns.

Table 4. Long-run relationship

GDP				**UNEMP**				**REER**			
Variable	**Coefficient**	**Std. Error**	**Prob.**	**Variable**	**Coefficient**	**Std. Error**	**Prob.**	**Variable**	**Coefficient**	**Std. Error**	**Prob.**
C	-11.3302	14.89127	0.452	C	7.991727	1.20671	0	C	-97.7822	291.3396	0.7391
FDI	-0.398777	0.611621	0.5188	FDI	-0.10974	0.063894	0.0945	FDI	-41.079	15.42602	0.0115
INF	-0.051466	0.016234	0.0032	INF	0.001287	0.001948	0.5131	INV	3.052512	1.165697	0.0128
INV	0.183004	0.043948	0.0002	INV	0.002781	0.004828	0.5681	INF	-0.50417	0.470293	0.2908
REER	-0.008593	0.005843	0.1506	TRADE	-0.02815	0.013295	0.0412	TRADE	-2.35595	3.209944	0.4677
REMIT	-1.159085	0.338596	0.0016	REMIT	0.125572	0.034654	0.0009	REMIT	4.166839	8.366495	0.06215
UNEMP	-0.08952	1.410797	0.9498	POP_G	1.627532	0.49057	0.0021	POP_G	72.73162	118.4398	0.543
TRADE	0.43596	0.117859	0.0008								
POP_G	9.946418	4.591711	0.0374								

Short Run Dynamics

For GDP, remittances show an immediate negative effect (-1.29483), suggesting that a 1% increase in remittances leads to approximately a 1.29% decrease in GDP in the short run. This finding contradicts some recent literature, such as Asafo-Adjei (2021), who found positive impacts of remittances on economic growth. However, it aligns with arguments presented by Chami et al. (2021) that remittances might reduce labor supply and productivity in the short term, potentially due to reduced incentives for work among recipient households. Regarding unemployment, remittances exhibit a positive short-run effect (0.123282), indicating that a 1% increase in remittances is associated with about a 0.12% increase in unemployment. This result contradicts studies like Jackman (2019), who generally found remittances to reduce unemployment. However, it supports the "moral hazard" hypothesis proposed by Azam and Gubert (2019), suggesting that remittances might increase reservation wages and reduce labor force participation in the short run. For the Real Effective Exchange Rate, remittances show a strong positive immediate effect (2.77471). This implies that a 1% increase in remittances leads to approximately a 2.77% appreciation in the real effective exchange rate. This

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finding strongly supports the Dutch disease hypothesis and aligns with recent studies such as Hassan and Holmes (2019), who found that remittances contribute to real exchange rate appreciation in developing countries.

The error correction term (ECt-1) is negative and statistically significant in all three models (-0.35937 for GDP, -0.789544 for UNEMP, and -0.8958 for REER). This term represents the speed of adjustment back to long-run equilibrium after a short-run shock. The negative sign indicates that the system corrects its previous period disequilibrium, ensuring long-run stability. For instance, the ECt-1 coefficient of -0.8958 in the REER model suggests that about 89.58% of any disequilibrium is corrected within one period, indicating a relatively rapid adjustment to shocks. These short-run dynamics highlight the complex nature of remittances' impacts on different economic variables. While remittances appear to have some negative short-run effects on GDP and employment, they contribute to real exchange rate appreciation, potentially indicating Dutch disease effects. The significant error correction terms suggest that these short-run impacts are eventually moderated as the economy adjusts towards its long-run equilibrium.

It is important to note that other variables like FDI, inflation, and trade openness also show significant short-run effects, underscoring the interconnected nature of these economic factors. For instance, FDI shows a positive effect on GDP (0.078625) but a negative effect on unemployment (-0.102721) and REER (-37.65), suggesting it might enhance growth and employment while improving competitiveness in the short run. In the GDP model, inflation shows a negative immediate effect (-0.0682), suggesting that a 1% increase in inflation leads to approximately a 0.07% decrease in GDP in the short run. For unemployment, inflation has a small positive effect (0.001125), indicating that higher inflation is associated with slightly higher unemployment. In the REER model, inflation shows a negative impact (-0.544), implying that higher inflation leads to real exchange rate depreciation. These findings generally align with economic theory and empirical studies like Barro (2013), who found negative relationships between inflation and economic growth. The positive effect on unemployment, although small, supports the short-run Phillips curve relationship. The negative effect on REER is consistent with the purchasing power parity theory, as explained by Bahmani-Oskooee and Kandil (2019).

Domestic investment shows a positive immediate effect on GDP (0.245271), suggesting that a 1% increase in investment leads to about a 0.25% increase in GDP. This aligns with growth theories and empirical findings, such as those by Barro and Sala-i-Martin (2021). For the REER model, investment has a positive effect (2.31599), indicating that increased domestic investment leads to real exchange rate appreciation. This could be due to increased domestic demand and potentially higher productivity, as discussed by Lartey (2020). Trade openness shows a positive effect on GDP (0.455264), suggesting that a 1% increase in trade openness is associated with about a 0.46% increase in GDP. This supports the widely held view that trade promotes economic growth, as found in studies like Frankel and Romer (2017). For unemployment, trade openness shows a negative effect (-0.02823), indicating that increased trade is associated with lower unemployment. This could be due to increased job opportunities in export-oriented sectors. In the REER model, trade openness has a negative effect (-2.2135), suggesting that increased trade leads to real exchange rate depreciation. This might be explained by increased competition and efficiency gains from trade, as discussed by Rodrik (2018).

Table 5. Short run relationship

Dependent Variable: GDP				Dependent Variable: UNEMP				Dep.Variable: REER			
Selected Model: ARDL(3, 3, 3, 2, 3, 3, 3)				Selected Model: ARDL(1, 2, 2, 2, 1, 2, 1)				Selected Model: ARDL(2, 2, 2, 2, 2, 2, 2)			
Case: Restricted Constant and No Trend				Case: Restricted Constant and No Trend				Case: Restricted Constant and No Trend			
Variable	Coefficient	Std. Error	Prob.*	Variable	Coefficient	Std. Error	Prob.*	Variable	Coefficient	Std. Error	Prob.*
GDP(-1)	0.351798	0.151232	0.0368	UNEMP(-1)	0.793236	0.053164	0.000	REER(-1)	0.91515	0.174825	0.000
GDP(-2)	-0.15803	0.160664	0.3433	FDI	-0.102721	0.001822	0.000	REER(-2)	-0.3583	0.140571	0.0191
GDP(-3)	-0.11559	0.066129	0.104	FDI(-1)	0.086518	0.006312	0.000	FDI	-37.65	0.741026	0.000
FDI	0.078625	0.140018	0.584	FDI(-2)	-0.004074	0.001731	0.0275	FDI(-1)	37.6189	6.977587	0.000
FDI(-1)	0.401337	0.112559	0.0035	INF	0.001125	0.000113	0.000	FDI(-2)	-15.546	5.91736	0.0162
FDI(-2)	0.185664	0.178034	0.316	INF(-1)	-0.000853	9.71E-05	0.000	INF	-0.544	0.046301	0.000
FDI(-3)	0.171466	0.170752	0.3336	INF(-2)	-6.73E-05	4.97E-05	0.1889	INF(-1)	0.53859	0.079855	0.000
INF	-0.0682	0.008705	0.000	TRADE	-0.02823	0.000422	0.000	INF(-2)	-0.2337	0.082316	0.0101
INF(-1)	0.008599	0.010862	0.4427	TRADE(-1)	0.022887	0.001429	0.000	INV	2.31599	0.149762	0.000
INF(-2)	-0.01147	0.008191	0.1848	TRADE(-2)	-0.000516	0.000376	0.1835	INV(-1)	-2.0793	0.420776	0.0001
INF(-3)	-0.01586	0.005316	0.0106	REMIT	0.123282	0.001485	0.000	INV(-2)	0.92737	0.384179	0.0255
INV	0.245271	0.026461	0.000	REMIT(-1)	-0.098932	0.00664	0.000	TRADE	-2.2135	0.160699	0.000
INV(-1)	0.083331	0.059079	0.1819	POP_G	-1.741054	0.028787	0.000	TRADE(-1)	2.30666	0.485382	0.0001
INV(-2)	-0.04912	0.039287	0.2333	POP_G(-1)	1.43068	0.100208	0.000	TRADE(-2)	-0.9887	0.363162	0.0131
TRADE	0.455264	0.027731	0.000	POP_G(-2)	-0.071221	0.022331	0.0041	REMIT	2.77471	0.534278	0.000

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TRADE(-1)	-0.15935	0.067941	0.0355	ECt(-1)	-0.789544	0.055333	0.000	REMIT(-1)	-3.3467	0.906892	0.0014
TRADE(-2)	0.048355	0.063611	0.4607	C	1.788278	0.420641	0.0003	REMIT(-2)	1.61729	0.72709	0.0378
TRADE(-3)	0.101427	0.045888	0.0456					ECt(-1)	-0.8958	0.180223	0.0001
REMIT	-1.29483	0.097565	0.000					C	44.7881	7.406277	0.000
REMIT(-1)	0.472001	0.203607	0.0374								
REMIT(-2)	-0.21164	0.197033	0.3023								
REMIT(-3)	-0.30975	0.147468	0.0558								
ECt(-1)	-0.35937	0.152354	0.0347								
C	13.0383	1.690615	0								

Residual and stability diagnosis

The residual and stability diagnosis are conducted in this section having estimated the effects of the covariates on the dependent variable in the short run. This is to ascertain if the estimated models are reliable and stable. Table 5 shows that the model has passed the diagnostic tests for Serial correlation, Normality and Heteroskedasticity. The Breusch-Godfrey statistic and Breusch-Pagan statistic have confirmed the absence of serial correlation and heteroscedasticity respectively. The Shapiro-Wilk test also satisfied the assumption of normality. Lastly, the stability of the parameters is also confirmed to be stable using the CUSUM and CUSUMSQ as presented in Figure A1 at the Appendix. As seen in the figure, all the blue lines fall within the red line's borders, showing that the study's models are stable at the 5% level of significance.

Table 6. Diagnostics Tests

Diagnostics Tests	**Statistic**	**Prob.**
Economic growth model		
Serial Correlation Test (Breusch Godfrey)	0.66244	0.4468
Heteroskedasticity Test (Breusch Pagan)	32.699	0.4325
Shapiro-Wilk normality test	0.96834	0.3185
Unemployment model		
Serial Correlation Test (Breusch Godfrey)	0.00693	0.9344
Heteroskedasticity Test (Breusch Pagan)	15.284	0.6424
Shapiro-Wilk normality test	0.79535	0.5426
REER model		
Serial Correlation Test (Breusch Godfrey)	0.13347	0.7203
Heteroskedasticity Test (Breusch Pagan)	22.77	0.5334
Shapiro-Wilk normality test	0.94258	0.4227

Conclusion and Recommendations

The study examined the complex relationships between remittances, economic growth, unemployment, and potential Dutch Disease effects in Nigeria using an ARDL model approach. The findings reveal a complex picture of remittances' impact on the Nigerian economy. In the long run, remittances were found to have a negative relationship with GDP growth, contradicting some previous studies but aligning with others that highlight potential negative effects such as reduced labor force participation and brain drain. The positive relationship between remittances and unemployment in both the short and long run supports the "moral hazard" hypothesis, suggesting that remittances might create disincentives for work. Notably, the study found evidence of Dutch Disease effects, with remittances showing a positive relationship with the Real Effective Exchange Rate (REER) in both the short and long run. This indicates that large remittance inflows may be contributing to real exchange rate appreciation, potentially harming the competitiveness of Nigeria's tradable sector.

The analysis also revealed important insights about other economic factors. Domestic investment and trade openness were found to have positive effects on GDP growth, underscoring their importance in driving economic development. The negative relationship between FDI and unemployment suggests that foreign investment plays a role in job creation. These findings have important policy implications. While

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remittances provide crucial support to many Nigerian households, policymakers need to be aware of their potential macroeconomic drawbacks. Strategies to channel remittances into productive investments, rather than solely consumption, could help mitigate negative effects. Additionally, policies to maintain competitiveness in the face of real exchange rate appreciation may be necessary to counter Dutch Disease effects. In conclusion, this study contributes to a more nuanced understanding of remittances' role in Nigeria's economic landscape. It highlights the need for careful policy design to maximize the benefits of remittances while minimizing potential negative impacts on growth, employment, and economic structure. Future research could further explore the mechanisms through which remittances affect these economic outcomes and investigate policy interventions that could enhance their positive impacts.

Appendix

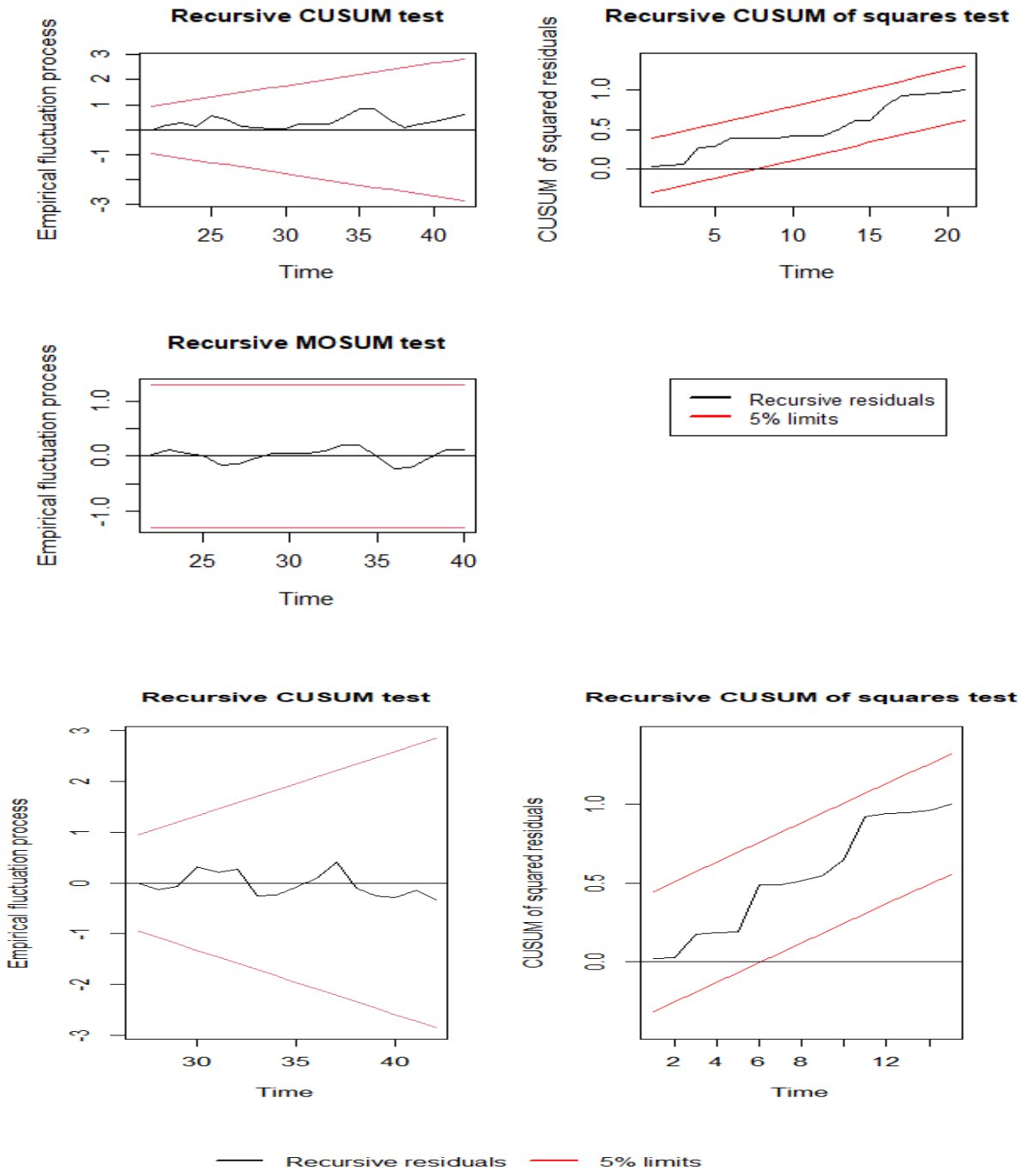

Figure A1: CUSUM and CUSUMSQ test results for the model

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