EXCHANGE RATE DEVALUATION, INTERNATIONAL TRADE AND ECONOMIC MISERY IN NIGERIA: IS THERE A MODERATING EFFECT?

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ABSTRACT

The study examines the effects of exchange rate and international trade on the economic Misery in Nigeria for the period of 1986 to 2023 using the Dynamic Ordinary Least Square (DOLS) technique. The findings revealed significant relationships between all the variables and economic conditions, offering insights crucial for policy formulation and economic management. The analysis demonstrates that exchange rate devaluation plays a pivotal role in shaping economic misery in Nigeria, export trade was found to have a positive and significant impact on economic misery based on the negative coefficient which implies that higher import results to a decline in economic misery. Imports show a significant positive impact on economic misery, suggesting that higher levels of imported goods contribute to economic challenges in form of inflation in Nigeria. The interaction between exchange rate devaluation and export trade also revealed significant impacts on economic misery. This interaction indicates that while export growth can alleviate economic distress, the extent of this benefit depends on exchange rate dynamics as increased exchange rate depreciation was seen to have dampening effect on export trade as their interaction tend to worsen economic misery in Nigeria. Consequently, this study reveals nuanced dynamics, and emphasized the need for coordinated policy measures to optimize export competitiveness amidst exchange rate fluctuations. Proactive policy interventions that promote export diversification, enhance production capacities, and manage import dependencies are essential for fostering sustainable economic growth and reducing economic misery in Nigeria.

Key words: Exchange rate, international trade, import, export, economic misery
(JEL: F16, F19, I13)

1 INTRODUCTION

Nigeria, a major player in the West African economy, has been grappling with economic instability and misery for decades. The country's economy has been plagued by poverty, inequality, increasing rate of inflation and unemployment, with a significant portion of the population living below the poverty line. Exchange rate fluctuations have been implicated in Nigeria's economic woes, with the value of the naira (NGN) experiencing significant volatility against major currencies like the US dollar (USD). Precisely, the naira has faced a significant devaluation against the US dollar,

with an average exchange rate rising from NGN 150/USD in 2015 to NGN 360/USD in 2020, from 360 naira/USD in 2020 to 412.440 NGN/USD in 2021 and to 436.330 NGN/USD and in 2023 it had an average rate of 460.702 NGN/USD (CBN, 2023). The exchange rate devaluation has been seen to have high implication for increased import prices, increased cost of living, high rate of inflation and lower purchasing power and in turn low rate of economic growth. Just like exchange rate devaluation, the Nigeria's economy is heavily reliant on international trade, with a significant portion of its GDP coming from exports precisely from oil exports. The country's major exports include crude oil, natural gas, and agricultural products, while its main imports include machinery, vehicles, and consumer goods.

Consequently, the country's trade balance has been consistently negative, with imports exceeding exports. This trade deficit has contributed to Nigeria's economic misery, characterized by: High poverty rates (over 40% of the population lives below the poverty line), significant income inequality (Gini coefficient of 0.43), unemployment (over 20% of the labor force is unemployed), low economic growth (average GDP growth rate of 2% from 2016 to 2020, and 2.51% in the second quarter of 2023) to mention but a few.

The effect of unemployment as a component of misery index cannot be overemphasized in the economic concept. It signifies joblessness within an economy (Dang, Soepding, & Halidu, 2024; Wasiu, Ofoke, & Kelechi, 2023; Leward, & Lazarus, 2021). According Ngubane, Mndebele, and Kaseeram (2023), roughly 80% of the world's population lives in extreme poverty (*see also* Ebunoluwa, & Yusuf, 2018; Škare, & Družeta, 2016). Furthermore, a 2022 review of studies showed that increased general measures of economic hardship specifically unemployment and, poverty leads to high rate of youth self-destruct which leads to increased youth unemployment and in turn poor growth rate (Sinyor, Silverman, Pirkis, & Hawton, 2024). Thus, misery index according to Büyüksarikulak and Suluk (2022) can be seen as a measure of economic distress felt by everyday people, due to the risk of (or actual) joblessness combined with an increasing cost of living. The misery index is calculated by adding the seasonally adjusted unemployment rate to the inflation rate. Since unemployment and inflation are both considered detrimental to one's economic well-being, their combined value is useful as an indicator of overall economic health. The original misery index was popularized in the 1970s with the development of stagflation, or simultaneously high inflation and unemployment. The relationship between, international trade, exchange rate devaluation and economic misery in Nigeria is multifaceted. Devaluation can lead to economic misery through various channels, including inflationary pressures, reduced purchasing power, unemployment, income inequality, and social unrest.

There is a growing literature on the subject of discourse; however, there is yet no consensus on the impact of exchange rate fluctuations and international trade on economic misery in Nigeria.

While some studies suggest that exchange rate devaluation and international trade, precisely export trade can lead to improved economic growth which can translate into a decline in economic misery, Musa, Muhammed, Nafisa, and Samaila, (2019), Ismailia (2016), Caglar and Titiloye (2019), Egoro and Obah, (2017), Agbo, Ebere and Oluchukwu, (2018), others posit they can exacerbate economic misery which consist of inflation and unemployment rates in Nigeria, (Loto, 2018; Michael and Inam 2020; Jelilor, Jibriu & Gayypov, 2017; Nkemdilim, & Ozegbe, (2021).; Shido-Ikwu, Dankumo, Pius & Fazing, 2023).

Consequently, the main objective is hinged on investigating how exchange rate fluctuations, and international trade can impact economic misery in Nigeria, and more importantly to examine the moderating effect of exchange rate devaluation on the export-economic misery nexus in other to inform policy decisions that can address the country's economic challenges.

This paper is thus structured into five sessions: introduction, literature review, methodology, result and discussion of findings, and policy recommendations.

2 LITERATURE REVIEW

2.1 Theoretical Literature

Several theories of the exchange rate devaluation, international trade, and economic growth/well-being have been established to show the link between exchange rate devaluation and international trade (export and import volumes) and how this in turn causes high inflation and job losses (increased unemployment rate) that can inflict economic hardship on the people. Among the theories are: the Monetarist theory, the Purchasing Power Parity theory, the Keynesian theory, the Balance of Payment theory (John Maynard Keynes and Jacob Viner in the early to mid-20th century), the Asset Market Model (Monetary approach to exchange rate theory) that was propounded by John Hicks and Robert Mundell in the 1960s, the Elasticity approach theory as developed by Paul Samuelson in the mid-20th century, the comparative advantage theory that was propounded by David Ricardo in 1817, the Heckscher-Ohlin theory that was proposed by Swedish economists Eli Heckscher and Bertil Ohlin in the early 20th century, with their seminal work published in 1919 and 1933, respectively, the Dependency Trade theory and others.

The balance of payments (BOP) theory highlights how exchange rate fluctuations impact a country's trade balance. A devaluation may improve a country's trade balance by making exports cheaper and imports more expensive. However, Nigeria faces structural issues, such as heavy dependence on oil exports and vulnerability to global price swings. According to the elasticity of demand hypothesis, the effectiveness of exchange rate devaluation in improving trade balances depends on the price elasticities of demand for exports and imports. For Nigeria, if the demand for exports is inelastic, the increase in revenue from higher prices may not compensate for the higher cost of imports, leading to a trade deficit. Prolonged deficits can drain foreign reserves, leading to chronic economic instability and increased economic distress for the population.

From the international trade angle, the comparative advantage theory suggests that countries should specialize in producing goods and services where they have a lower opportunity cost and trade with other countries to maximize overall welfare and efficiency. The Heckscher-Ohlin theory of international trade upon which the framework of this study is hinged on, opines that countries will export goods that intensively use their abundant factors of production and import goods that intensively use their scarce factors of production. In the context of Nigeria's economic misery and conditions of Nigerians, the Heckscher-Ohlin theory can provide insights into the country's trade patterns and their impact on the economy. This implies that with devaluation, Nigeria can export more of its goods that intensively use their abundant factors such as petroleum products and make foreign earnings that can be utilized to boost the well-being of the people when channelled into the productive sectors that can create jobs and reduce unemployment.

2.2 Empirical Literature

2.2.1 Exchange Rate Devaluation on Economic Misery in Nigeria

There have been quite a number of studies in the area of exchange rate devaluation and economic growth or performance in Nigeria with mixed outcomes. Okeowo, and Awotade (2024) opined that the sustainability of any economies' growth is heavily dependent on exchange rate dynamics amongst other macroeconomic variables. Going further, studies that found exchange rate to have a positive and significant impact on economic growth includes; Musa et al., (2019); Ismaila (2016), Caglar and Titiloye (2019) while those that found exchange rate to be adversely related with

economic growth includes Loto (2018), Michael, & Inam (2020), Jelilor, Jibriu & Gayypov (2017), Nkemdilim, & Ozegbe (2021).

As to how exchange rate impact economic misery, there is a growing literature with no consensus. Specifically, Nwogwuguw and Umeghalu (2021) examined the impact of exchange rate, international trade and economic misery in African countries with low human development using the System Generalized Method of Moments (System-GMM) estimation technique for 17 African countries for the periods of 1995-2018. The result revealed that total export, manufacture export, per capita GDP growth rate, exchange rate and lagged form of economic misery all have positive effect on economic misery. While the effects of total export, manufacture export, per capita GDP growth rate, and exchange rate on economic misery are significant, those of balance of payments and lagged form of economic misery are insignificant. While this study recommends that international trade be engaged strategically such that it results in favorable balance of payments, it also encourages the discarding of obsolete trade policies such as outright bans on importation of certain commodities. Bilateral trade agreements are recommended over multilateral trade agreements, since they are more mutually beneficial and binding on the parties involved. Earlier study by Tukur, Ibrahim, Ashemi, and Adamu (2023) examined the effect of exchange rate and other macro variables on economic growth dynamics on a time series analysis from 1985 to 2022 in Nigeria. It was revealed that exchange rate had a simplex relationship with inflation. Thus, one of the recommendations opined by their study for sustainable growth is to diversify to the non-oil sectors. In the same vein, having adopted the Toda Yamamoto Vector Autoregressive and Granger Causality approach, Asuzu and Anyanwu (2023) analyzed exchange rate, money supply, and inflation on economic growth volatility. The study found a joint causality between money supply and exchange rate for the period reviewed. Emmanuel, Joel, and Baajon (2019) investigated the relationship that lies amidst exchange rate and Unemployment (being one of the components of economic misery) in Nigeria using annual data of Thirty-one Years (1986 to 2017). In order to achieve the objective of the paper, Autoregressive Model with distributed Lag was used to find out the relationship between Real Exchange rate and Unemployment in the country. It was found that Real Exchange Rate has positive effect on unemployment during the period. With high exchange rate, unemployment rate increases. The paper advises for efforts to increase supply of foreign exchange earnings in the country so as to curtail excess demand for it. This will lead to producing more goods as industries that would be established for such production will absorb more workforce out of the unemployed. Moreover, Niken, Haile, and Berecha (2023), studied factors that boosts economic growth, among which are unemployment and inflation rate, in the economy of Ethiopia, using the VAR, and ECM technique. Their results from the period studied- 1980 to 2020, showed that the two variables had immaterial effects on economic growth especially in the long run. Thus, suggested amongst others, the need to motivate output in other sectors of the economy and also increase labour-intensive ventures so as to engender growth.

2.2.2 Impact of International Trade on Economic Misery in Nigeria

There is a limited studies on international trade and its effect on economic misery much interest has been on the economic growth implication of international trade. To this end, various studies have shown that a positive and significant relationship runs between international trade and economic growth (Egoro and Obah, 2017; Agbo, Ebere and Oluchukwu, 2018), while others found a negative and significant impact between international trade and economic growth (Shido-Ikwu, Dankumo, Pius & Fazing, 2023).

In this light, Shido-Ikwu, et al., (2023) studied the impact of international trade on Nigeria's economic growth from 1981 to 2019 and found that import trade and foreign direct investment had a negative impact on economic growth, while export trade had a direct and significant impact. The study suggested that the Nigerian government should encourage exports and discourage imports by providing subsidies and tax concessions to local producers, enhancing foreign direct investments, and implementing friendly foreign trade policies.

With regards to studies on international trade and economic misery, Egbuche, Kalu, and Otto (2018) queried how international trade has impacted unemployment in Nigeria, from1981-2017. In other to accomplish set objectives, their research used unemployment as regress and, import, export, as well as exchange rate, served as regressors. Descriptive statistics and ECM were employed for data analysis. The result showed the existence of long run relationship between trade and work force cutback. While it was revealed that import reduced unemployment, exports, currency rate plus ease of doing business increased unemployment for the periods studied.

More recently, Adefabi (2023), examined the connections between openness in trade and inflation in Nigeria using monthly data from January 2000 to December 2021. It utilized the ARDL modeling approach to determine the magnitude of the short-and long-run impacts of openness in trade on inflation. Empirical evidence from the study revealed that there is long-run relationship between trade openness and inflation rate in Nigeria. The study established that trade openness endangered inflation rate in Nigeria in both the short-run and long-run, which implies that trade openness had detrimental effect on inflation rate irrespective of the time horizon. Also, while money supply had a negative impact on inflation rate, real effective exchange rate, economic growth (RGDP) and crude oil price had favorable impact on inflation rate in Nigeria. The study of Pal, Villanthenkodath, Patel and Mahalik (2022) explored the impact of remittance inflows as well as unemployment amongst other variables on economic growth for high-, low-, and middle-income countries from 1991 to 2020. Having used the fixed and random effects, and the fully modified ordinary least square estimates, the outcomes confirmed that unemployment is adversely affected by remittance inflows in high-income countries.

2.3 Gaps in the Literature and Value Addition

Based on literatures reviewed, extensive research has been done on exchange rate and international trade with focus on how they impact economic growth without keen interest on the wellbeing of the citizenry (Adefabi, 2023; Niken, Haile, & Berecha, 2023; Tukur, Ibrahim, Ashemi, & Adamu, 2023). While, Pal, *et al.* (2022) focused on the wellbeing of the citizenry without considering the effect of external factors such as effects of country's international transactions and other salient factors on growth. Consequently, this study focused on how exchange rate devaluation and international trade affect the economic misery which is a measure of economic condition as captured by a sum of unemployment and inflation rates and more importantly to examine the moderating effect of exchange rate devaluation on the export-economic misery nexus in Nigeria which is lacking in existing literatures.

3 METHODOLOGY

3.1 Theoretical Framework

This study is hinged on the Heckscher-Ohlin theory of international trade which states that countries will export goods that intensively use their abundant factors of production and import goods that intensively use their scarce factors of production. The Heckscher-Ohlin theory can be used to provide insights into Nigeria's trade patterns and their impact on the economy. Nigeria is rich in natural resources, particularly oil, which constitutes a significant portion of its exports.

According to the Heckscher-Ohlin theory, Nigeria's abundance of natural resources would lead it to export goods that require intensive use of oil such as petroleum products and this means that Nigeria should export more of crude oil and other refined products gotten from it and import goods that require scares means of production in Nigeria, to avoid neglecting sectors that have abundant factors of production in Nigeria which in turn can lead to heightened unemployment rate.

In connecting this theory to this study, it is obvious that international trade in form of export and import can either reduce or exacerbate economic misery (unemployment and inflation rate) depending on their volume and the exchange rate position.

3.2 Model Specification

To evaluate the hypotheses of this study as earlier stated, the study adopts and modifies the model as specified Ozegbe and Iheanachor (2021) using Dynamic Ordinary Least Squares method (DOLS) and using economic misery in place of real GDP. The model is specified below;

$$ECO\_MISERY = f(EXR, EXP, IMP, EXR\_EXP, GFCF) \quad (3.1)$$

The generalized form of Dynamic Ordinary Least Squares (DOLS) models for this study is as follows:

$$ECO\_MISERY_t = \beta_0 + (X_t' + Z_t')\beta_t + \sum_{i=q}^{j=r} \delta(\Delta X_{t-1}' + \Delta Z_{t-1}') + \mu_t \quad (3.2)$$

Where: q represents the lags and r represents the leads of the differenced regressors that soak off all the long-run correlation between the stochastic terms.

The specific DOLS form of the model with two leads and lags (that is, $q = 2$ and $r = 2$) is given as follows:

$$\begin{aligned} ECO\_MISERY_t = {} & \beta_0 + \beta_1 EXR_t + \beta_2 EXP_t + \beta_3 IMP_t + \beta_4 EXR\_EXP_t + \beta_5 GFCF_t + \\ & \delta_1 \Delta EXR_t + \delta_2 \Delta EXR_{t+1} + \delta_3 \Delta EXR_{t+2} + \delta_4 \Delta EXR_{t-1} + \delta_5 \Delta EXR_{t-2} + \delta_6 \Delta EXP_t + \\ & \delta_7 \Delta EXP_{t+1} + \delta_8 \Delta EXP_{t+2} + \delta_9 \Delta EXP_{t-1} + \delta_{10} \Delta EXP_{t-2} + \delta_{11} \Delta IMP_t + \delta_{12} \Delta IMP_{t+1} + \\ & \delta_{13} \Delta IMP_{t+2} + \delta_{14} \Delta IMP_{t-1} + \delta_{15} \Delta IMP_{t-2} + \delta_{16} \Delta EXR\_EXP_t + \delta_{17} \Delta EXR\_EXP_{t+1} + \\ & \delta_{18} \Delta EXR\_EXP_{t+2} + \delta_{19} \Delta EXR\_EXP_{t-1} + \delta_{20} \Delta EXR\_EXP_{t-2} + \delta_{21} \Delta GFCF_t + \\ & \delta_{22} \Delta GFCF_{t+1} + \delta_{23} \Delta GFCF_{t+2} + \delta_{24} \Delta GFCF_{t-1} + \delta_{25} \Delta GFCF_{t-2} \quad \delta \quad + \mu_t \end{aligned} \quad (3.3)$$

Where: β_1 to β_5 are the parameters of interest whereas δ_1 to δ_{25} are the nuisance variables' parameters which mop up all forms of serial correlation and endogeneity problems in the model should they be present. ECO_MISERY- a proxy for economic condition or hardship measured by a sum of inflation and unemployment rates (Okun, 1962), EXR - exchange rate being the local currency in terms of US dollar, EXP which captures export earnings or receipts measured in Billion Naira, IMP- Import being money spent on payments for imported goods and measured in Billion naira. EXR_EXP represents an interaction of exchange rate and export earnings, GFCF-gross fixed capital formation a proxy for domestic investment

Apriori expectations $, \beta_1, \beta_2, \beta_4, \beta_5 < 0$; $\beta_3 > 0$

3.3 Method of Data Analysis

The Dynamic ordinary least squares econometric technique was adopted for estimations of the model in this study. This technique addresses all the objectives earlier stated in this study. It simultaneously provided both short- and long-run parameter estimates of the specified model given that there is cointegration among the variables. The Dynamic Ordinary Least Squares (DOLS) is a parametric approach that improves OLS by handling small sample sizes and dynamic sources of bias as well as providing a remedy to endogeneity problems that may be present in the model. To this end, this study employed Dynamic OLS (DOLS) with two leads and lags. The DOLS method is appropriate for this study since a long-run relationship runs between the variables. The choice of this method is based on its assumption that there is independence in the errors in the model, they employ two approaches to remove the deterministic components from both the dependent variable and the regressors to reweight the data before computing DOLS. The technique was used to evaluate the four objectives of this study. The DOLS estimation was done following the laid-down procedures which included carrying out the pre-test analysis on the time series data which included; descriptive statistics, correlation analysis, and unit root and cointegration tests. Following the cointegration result which showed the existence of a long-run relationship, we then estimated the DOLS on the variables using the normal approach using the stated leads and lags for correcting serial correlation problems. This approach does not include the coefficients of the nuisance variables.

4. RESULTS AND DISCUSSIONS ON FINDINGS

4.1 Presentation and Discussion of Descriptive Statistics Results

The summary statistics of all the variables used in this exercise are presented and discussed in Table 4.1.

Table 4.1: Descriptive Statistics.

	ECO_MISERY	EXR	LNIMP	LNEXP	EXR_INEXP	LNGFCF
Mean	169.0191	134.2098	14.27244	14.55335	2133.765	8.202656
Median	158.2955	122.8594	14.69671	15.19449	1931.655	8.560618
Maximum	360.2445	425.4140	17.49162	17.12062	6882.228	11.20609
Minimum	25.77540	2.020575	8.696778	9.096118	18.37939	4.690111
Std. Dev.	97.90965	113.8455	2.327667	2.172146	1895.418	1.840038
Skewness	0.212158	0.983917	-0.730613	-0.877739	0.987581	-0.336370
Kurtosis	1.906196	3.302866	2.549133	2.677400	3.172712	2.193660
Jarque-Bera	2.179380	6.276491	3.702564	5.044143	6.224233	1.746042
Probability	0.336321	0.043359	0.157036	0.080293	0.044507	0.417688
Sum	6422.725	5099.971	542.3529	553.0273	81083.05	311.7009
Sum Sq. Dev.	354693.1	479549.5	200.4672	174.5740	1.33E+08	125.2723
Observations	38	38	38	38	38	38

Source: Author's compilation (2024) from E-views version 10.

From Table 4.1, the mean value of ECO_MISERY which stood at 169.0191 revealed that any value above this indicate poor economic condition while those below the mean value indicate a better economic condition. The exchange rate mean value was 134.2098 showing that any exchange rate above this speaks of high level of depreciation of the Naira which is the case for the period under study. The skewness and kurtosis values indicate that all the variables were positively skewed with ECO_MISER, exchange rate and EXR_EXP were positively skewed while the other variables, import, export and GFCF were negatively skewed. Also, the Jarque bera and its corresponding probability value showed that ECO_MISERY, export, import and GFCF were normally distributed. Judging from the probability value that is greater than the 5 percent level of significance, we therefore accept the null hypothesis of a normal distribution. The other variables (EXR, and EXR_EXP) were not normally distributed as their Jarque- Bera probability vales were found to be less than 0.05. The kurtosis values show that and EXC and EXR_EXP were found to be Mesokurtic while ECO_MISERY, IMP, EXP, and GFCF were seen to be Platykurtic.

4.2 Analysis of the Pairwise Correlation Statistics.

The Correlation matrix is presented in the Tables 4.2, the result reveals the pair wise relationship among the variables.

Table 4.2: CORRELATION MATRIX

	ECO_MISERY	EXR	EXP01	IMP	EXR_EXP	GFCF
ECO_MISERY	1.000000	0.293814	0.443391	0.217327	0.256200	0.101163
EXR	0.293814	1.000000	0.784775	0.733438	0.825105	0.843516
EXP01	0.443391	0.784775	1.000000	0.689825	0.908593	0.653148
IMP	0.217327	0.733438	0.689825	1.000000	0.745445	0.768568
EXR_EXP	0.256200	0.825105	0.908593	0.745445	1.000000	0.790200
GFCF	0.101163	0.843516	0.653148	0.768568	0.790200	1.000000

Source: Author's compilation (2024) from E-views version 10.

From Table 4.2, all the independent variables EXR, EXP01, EXR_EXP and GFCF were seen to be positively and moderately correlated with Economic misery (ECO_MISERY) as seen in the table. Also, since all the independent variables were seen not be highly correlated, we can conclude that the chances of multicollinearity may be slim.

4.4 Unit Root Test

The unit root test is the test for stationary of the variables used in the model. In testing for unit root in the study, The Augmented Dickey Fuller (ADF) test was adopted. The result is presented in the Table 4.3 as follows:

Table 4.3 Unit Root Test for Variable at Levels and First Difference.

	UNIT ROOT AT LEVELS			UNIT ROOT TEST AT FIRST DIFFERENCE		
Variables	ADF Test Statistics	ADF Critical Values (5% level)	Remark	ADF Test Statistics	ADF Critical Values (5% level)	Remark
ECO_ MISERY	-3.374124	-2.943427	Stationary			
EXR	-2.523925	-2.943427	Non stationary	-4.619409	-3.540328	Stationary
EXP	0.220047	-2.960411	Non stationary	-4.172576	-3.562882	Stationary
IMP	-3.120939	-2.945842	Stationary			
EXR_ INEXP	-1.818384	-2.948404	Non Stationary	-5.926005	-3.544284	Stationary
GFCF	-1.449752	-2.943427	Non Stationary	-4.795774	-3.540328	Stationary

Source: Authors' compilation (2024) from E-views version 10.

Table 4.3 presents the ADF test result for stationarity of all variables employed in this study. From it, it can be deduced that EXR, EXP, EXR_INEXP, and GFCF only became stationary at first deference. While ECO_MISERY and IMP were stationary at levels.

4.4 Co-integration Test

Table 4.3 Johansen Co-integration Test

Series: ECO_MISERY EXR LNEXP LNIMP EXR_INEXP LNGFCF Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.730516	130.7865	95.75366	0.0000
At most 1 *	0.596456	83.58171	69.81889	0.0027
At most 2 *	0.481830	50.91283	47.85613	0.0251

At most 3	0.397730	27.24453	29.79707	0.0958
At most 4	0.210326	8.990731	15.49471	0.3662
At most 5	0.013515	0.489873	3.841466	0.4840

Source: Authors' compilation (2024) from E-views version 10.

As revealed in table 4.4 the cointegration test based on the trace test indicates that there are three co-integrating equations at the 5 percent level. Similarly, these results show that a long run relationship exists among the variables in the model.

4.5 Estimation Procedure

The estimation of the long-run estimates in a co-integrated series with the OLS will yield inconsistent and inefficient parameters therefore Stock and Walson (1993) recommended a dynamic OLS estimator (DOLS) to estimate the long-run relationship. The DOLS is a parametric analysis, which accounts for problem of endogeneity and serial correlation in the OLS estimator and thus, imposes additional restrictions on variables to have the same level of stationarity. The DOLS result is presented in Table 4.5 as follows:

Table 4.5.1 Dynamic OLS Estimation

Dependent Variable: ECO_MISERY				
Method: Dynamic Least Squares (DOLS)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXR	-40.45575	7.703149	-5.251846	0.0344
LNEXP	-3137.663	521.0678	-6.021602	0.0265
LNIMP	1886.888	235.1512	8.024148	0.0152
EXR_INEXP	1.192702	0.219458	5.434762	0.0322
LNGFCF	2621.022	580.5408	4.514794	0.0457
C	408.8360	496.9579	0.822677	0.4972
R-squared	0.996367	Mean dependent var		176.7293
Adjusted R-squared	0.941872	S.D. dependent var		96.88703
S.E. of regression	23.35922	Sum squared resid		1091.307
Long-run variance	108.2786			

Source: *Author's computation from Eviews10 output, (2024)*

From the estimated result of the model is presented in Table 4.5.1, the R-squared value of 0.996 showed that about 99.6 percent of the changes in economic misery explained by the explanatory variables, and 94 percent when adjustment was made for the degree of freedom as shown by the adjusted R-square.

Generally, the result showed that all the variables met the expected sign except for exchange rate and GFCF. Specifically, Exchange rate (EXR) had a negative and statistically significant impact on economic misery at a 5 percent level of significance. The estimated value of its coefficient implies that all things being equal, a 1 naira increase in exchange rate would translate to a 40.45575% decline in economic misery. Overall, it meant that exchange rate devaluation reduces economic misery. This finding met the expected sign and it's in tandem with Nwogwuguw and Umeghalu (2021), and Emmanuel, Joel and Baajon (2019). The results of the estimated DOLS

also showed that export (LNEXP) had a negative and significant impact on economic misery at the 5 percent level. The estimated value of the coefficient indicated that holding other factors constant, 1 naira increase in export volume would translate to a decline in economic hardship by 3137.663 naira during the period under study. This showed that foreign earnings from exports reduces economic misery through its reduction in inflation and unemployment rates as increased export earnings will cause an increase in domestic production, employment level, individual's income level and increase the purchasing power of the people. This finding is in line with Agbo et. al., (2018) and Shido-Ikwu et al., (2023). Also, import volume had a positive relationship and a 5 percent significant impact on economic misery in Nigeria. The sign expectation was met accordingly. The coefficient value implied that ceteris paribus, a naira increase in payments made on imports will led to 1886.888 naira increase in economic misery which may be in form of increased imported inflation which can worsen purchasing power, and job losses that can trigger unemployment rate. Therefore, increased import volume significantly worsens the economic misery in Nigeria. This result supports the finding of Shido-Ikwu et al., (2023) where import was found to have an adverse effect on economic misery.

Regarding the moderating variable; exchange rate devaluation and export (EXR_EXP) which is a proxy to ascertain whether exchange rate depreciation has any moderating effect on the economic misery-export nexus, the result showed a positive coefficient which was significant at the 5 percent level. The positive coefficient was not in tandem with the apriori sign expectation indicating that exchange rate devaluation has an adverse effect on economic misery. Showing that an increase in depreciation of the currency, translates to an increase in economic hardship in the face of export trade. This implies that the devaluation of the naira that is supposed to address trade imbalances and stimulate exports and in turn reduce economic hardship was rather found to exacerbate economic misery, particularly for lower-income households that experience a decline in purchasing power following increase in imports due to devaluation.

Lastly, the control variable, GFCF a proxy for domestic investment was seen to have a positive and significant impact on economic misery at a 5 percent level of significance. The value of coefficient implies that, holding other factors constant, a 1 unit increase in GFCF would increase economic misery by 2621.022 naira. This is not in line with expected sign as domestic investment is expected to alleviate economic misery by increasing employment level. The results suggested that a direct relationship existed between GFCF and economic misery in Nigeria during the period under study.

4.5.2 Post Estimation Diagnostic Test

For reliability of the estimates, the residuals normality test, Serial correlation and test for the presence of Heteroscedasticity in the model was done.

4.5.2.1: Normality Test

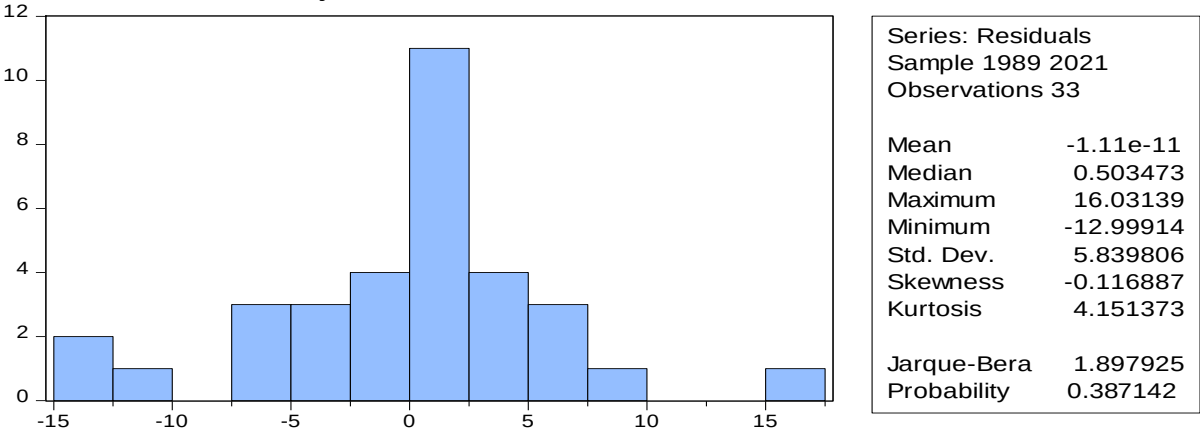

Fig.4.1. Normality Test for the residual.

From the Normality test result of the residuals of the model, it shows that the residuals are normally distributed as the probability value of the Jarque-Bera being 0.3871 was greater the 0.05.

4..5.2.2: Correlogram Q-Statistics Serial Correlation Test

The Correlogram Q-Statistics was employed to verify the presence of autocorrelation in the model while histogram diagnostic test was employed to check for the normality of the residual series. The results are presented in Table 4.5.2:

Table 4.5.2: Correlogram Q-Statistics Serial Correlation Test.

	AC	PAC	Q-Stat	Prob*
1	0.316	0.316	4.0913	0.043
2	-0.163	-0.291	5.2076	0.074
3	-0.117	0.051	5.7973	0.122
4	-0.060	-0.094	5.9582	0.202
5	-0.188	-0.193	7.5815	0.181
6	-0.085	0.043	7.9271	0.243
7	0.152	0.102	9.0527	0.249
8	0.196	0.077	11.003	0.202
9	-0.072	-0.160	11.274	0.257
10	-0.191	-0.092	13.263	0.209
11	-0.113	-0.064	13.982	0.234
12	-0.129	-0.128	14.958	0.244
13	-0.082	0.021	15.368	0.285
14	-0.021	-0.126	15.396	0.352
15	0.199	0.175	18.003	0.263
16	0.229	0.062	21.630	0.156

Source: *Author's computation from Eviews10 output, (2024)*

Table 4.5.2 presents the results of the serial correlation test using correlogram Q-statistics for 16 lags. The null hypothesis is that there is the absence of serial correlation in the model. About 15 out of the 16 lags had probability values of Q-stats above the 5% level of significance, the null hypothesis of no serial correlation is accepted.

4.5.2.3: Heteroskedasticity Test Result

Table 4.5.3: The White heteroskedasticity test.

Heteroskedasticity Test:			
F-statistic	0.841595	Prob. F(19,18)	0.6443
Obs*R-squared	17.87661	Prob. Chi-Square(19)	0.5307
Scaled explained SS	8.239061	Prob. Chi-Square(19)	0.9841

Source: *Author's computation from Eviews10 output, (2024)*

The White heteroskedasticity test showed that the F-statistic value 0.841595 was not significant as the probability value of 64% is greater than 5% level of significance as seen in table 4.5.3. This implied that there was no heteroskedasticity problem in the estimated model.

4.6 Test of Hypotheses

The hypotheses formulated in this study aimed to investigate the impact of exchange rate devaluation, export trade, import trade, and the interaction between exchange rate devaluation and export trade on Nigeria's economic misery index. The DOLS model estimation results are utilized to test these hypotheses.

HO_1: Exchange rate devaluation does not have any significant impact on the economic misery in Nigeria.

The coefficient for the exchange rate (EXR) is -40.4558 with a t-statistics of -5.25 whose absolute value is greater than 2 with a p-value of 0.0344, indicated a significant negative impact of exchange rate devaluation on economic misery. Since the p-value is less than 0.05, we reject the null hypothesis. Thus, exchange rate devaluation has a significant impact on economic misery in Nigeria.

HO_2: There is no significant impact of export trade on economic misery in Nigeria.

Given the coefficient for exports (EXP) which is -3137.663 with a t-statistics value of -6.02 whose absolute value appears to be greater than 2 and a p-value of 0.0265, indicating a significant negative impact on economic misery. Given that the p-value is less than 0.05, we reject the null hypothesis and therefore, conclude that export trade has a significant impact on the economic misery in Nigeria.

HO_3: There is no significant impact of import trade on economic misery in Nigeria.

The coefficient for imports (IMP) is 1886.88 with a t-statistics value of 8.024 that is greater than 2 and a p-value of 0.0152, indicating a significant positive impact on economic misery. Since the p-value is less than 0.05, we reject the null hypothesis. Hence, we conclude that import trade has a significant impact on the economic misery in Nigeria.

HO_4: Exchange rate devaluation does not have any significant moderating impact on the export trade-economic misery nexus.

The coefficient for the interaction between exchange rate and export (EXR_EXP) is 1.1927 with a t-statistics value of 5.434 that is greater than 2 and a p-value of 0.0322, indicating a significant positive impact on economic misery. Given that the p-value of the interaction variable is less than 0.05, we reject the null hypothesis. Thus, state that exchange rate devaluation has a significant moderating impact on the export trade-economic misery nexus.

5. CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1 Summary of Findings

The study examined the effects of exchange rate and international trade on the economic condition of Nigeria, with the following summary of findings.

1. Higher exchange rates (indicative of currency depreciation) significantly reduce economic misery in Nigeria for the period under study.
2. Increased export trade was found to have a positive and significant impact on economic condition as its negative sign shows that export reduces economic misery.
3. Import volume has a significant positive association with economic misery, indicating challenges associated with import-driven inflation and its implications for domestic production capacities that have adverse implication for job creation and employment opportunity.
4. The interaction between exchange rate devaluation and export trade was found to have a positive and significant influences economic misery.

Consequently, the study recommends the following to guide policymakers and stakeholders in addressing economic challenges.

1. Since exchange rate devaluation was found to have a significant impact on economic condition, we therefore recommend that the monetary authorities should implement and maintain a stable and competitive exchange rate regime that supports export competitiveness and mitigates inflationary pressures associated with imports. Periodic assessments of exchange rate policies should consider their impact on economic conditions and adjust as necessary to promote economic stability.
2. Policies should focus on enhancing export capacities, improving market access, and reducing trade barriers to capitalize on global trade opportunities and stabilize export revenues.
3. Develop strategies to manage import levels effectively, particularly for goods that compete with domestic production. Tariff adjustments, import substitution policies, and trade agreements should be leveraged to protect local industries, promote self-sufficiency, and reduce dependency on imported goods.
4. Since exchange rate depreciation was found to have a significant adverse effect on economic misery, that is, worsen economic condition, we therefore suggest the maintenance of stable exchange rate or if a flexible exchange rate must be adopted it must be accompanied with strong export diversification as earlier mentioned.

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