



## NEXUS BETWEEN TOURISM SECTOR OUTPUT AND MACROECONOMIC INDICATORS IN NIGERIA

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### ABSTRACT

Tourism has become one of the largest export industries worldwide and a key sector necessary for the socioeconomic growth of nations. Tourism's considerable and recognized roles as a foreign exchange earnings source, employment generation, and public income, amongst others, towards the growth of an economy have drawn much attention. The sector's performance is somewhat dependent on the macroeconomic variables in an economy. Thus, this study examines the relationship between tourism sector output and macroeconomic variables in Nigeria, covering the period 1991-2020. Tourism sector output proxied by tourism sector contribution to the GDP was employed as the dependent variable. At the same time, interest rate, foreign exchange and inflation rate, and money supply were the independent variables. The autoregressive distributed lag was employed to analyze data for the study. The ARDL's result cointegration test shows a long-run relationship between the variables employed, and a significant relationship exists between the dependent and independent variables. Based on the findings, the study recommends that interest rate, foreign exchange rate and inflation as they impact the tourism sector's performance. These variables tend to impact the tourism sector's performance and, as such, should be monitored and controlled.

**Keywords:** Tourism, Cointegration, ARDL, ECM

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### ABSTRAK

Pariwisata telah menjadi salah satu industri ekspor terbesar di dunia dan sektor kunci yang diperlukan untuk pertumbuhan sosial ekonomi negara. Peran pariwisata yang cukup besar dan diakui sebagai sumber devisa, penciptaan lapangan kerja, dan pendapatan masyarakat antara lain terhadap pertumbuhan ekonomi telah banyak menarik perhatian. Kinerja sektor ini bergantung pada variabel ekonomi makro dalam suatu perekonomian. Dengan demikian, penelitian ini mengkaji hubungan antara output sektor pariwisata dan variabel ekonomi makro di Nigeria, yang mencakup periode 1991-2020. Output sektor pariwisata yang diproksikan dengan kontribusi

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sektor pariwisata terhadap PDB digunakan sebagai variabel dependen. Pada saat yang sama, suku bunga, valuta asing dan tingkat inflasi, dan jumlah uang beredar merupakan variabel independen. ARDL digunakan untuk menganalisis data untuk penelitian ini. Uji kointegrasi hasil ARDL menunjukkan hubungan jangka panjang antara variabel yang digunakan, dan ada hubungan yang signifikan antara variabel dependen dan independen. Berdasarkan temuan tersebut, studi ini merekomendasikan suku bunga, nilai tukar mata uang asing dan inflasi karena mempengaruhi kinerja sektor pariwisata. Variabel-variabel ini cenderung berdampak pada kinerja sektor pariwisata dan karenanya harus dipantau dan dikendalikan.

**Kata Kunci:** Pariwisata, Kointegrasi, ARDL, ECM

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## Introduction

In many nations, tourism has grown to be a substantial driving force of socioeconomic improvement, a number one supply of sales throughout international locations, and an opportunity approach for financial sustainability and diversification (Ajudua et al., 2021). According to Asuquo et al. (2016), tourism is the sum of all phenomena and interactions that arise from site visitors' motion and temporary lives, so long as the lives do now no longer cause everlasting house and the cause in their go-to is not for sales generation. It has proved to be a robust and resilient financial operation and a pivotal contributor to countrywide financial improvement. It has produced billions of bucks in exports and hundreds of thousands of jobs over the years. It additionally contributes considerably to the socioeconomic and political improvement of vacation spot international locations by using growing awareness, information and admiration for cultural range and life methods. Recognizing those realities, many growing and evolved international locations now bear in mind tourism as a possible desire for long-time period growth. Tourism has elevated to grow to be the world's most significant and fastest-developing financial sector. It is attributed to an upward push in site visitors and visitor points of interest worldwide.

Peace et al. (2016) posited that if Nigeria is to diversify, the improvement of visitor sights will become critical. Over the past three decades, the tourism enterprise has undergone a massive transformation. Tourism has overtaken business crop farming and different number-one industries as a massive country comprehensive profits source, export earnings, and activity advent in maximum growing countries (Yusuff, 2016). Both public and personal excursion operators have seized possibilities to interact in commercial enterprise practices that draw traffic to their countries. Major global economies have deliberate their regions, towns, and states to capitalize on the possibilities provided via way of means of the tourism enterprise in order that vacationers and buyers withinside the tourism enterprise can be attracted to them (Celik et al., 2013). The variety of vacationers and their spending extensively affect revenue, authorities' revenue, wages, the stability of payments, the environment, and the vacation spot areas' culture. A boom in tourism contributes to jobs, revenue, production, and inflation; however, a boom in tourism can jeopardize the environment's outstanding sustainability (Celik et al., 2013).

Accordingly, Abubakar (2014) posits that tourism presents process advent and economic boom opportunities. According to the statistics, Nigeria will benefit from 897,500 jobs, translating to N252 billion in investment, equal to a 1.6 cent annual increase, to attain 5.4

according to cent in 2022. Approximately 840,000 Nigerians paint immediately within the tourism zone, accounting for 1.4 per cent of the labour force. According to the [WTTC \(2022\)](#), Nigeria's journey and tourism zone are anticipated to create a similarly 2.6 million new jobs over the subsequent decades, doubling the variety of these hired in the zone through 2032. Also, the WTTC's Economic Impact Report (EIR) forecast indicates a mean of almost 260,000 new jobs might be created every 12 months for the subsequent ten years, attaining extra than 5.1 million for the zone.

Furthermore, the EIR indicates that Nigeria's journey and tourism contribution to the GDP is forecasted to develop at a mean fee of 5.4% between 2022-2032, notably outpacing the three% boom fee of the prevailing economic system. Consequently, this will enhance Nigeria's tourism zone contribution to the destination's GDP to almost N12.three trillion through 2032, representing four.9% of the whole economic system of the destination, notwithstanding the effect of the 2019 international pandemic. Moreover, the [WTTC's \(2022\)](#) document additionally presents optimism for the short-term restoration of Nigeria's tourism industry because the zone's contribution is about to attain close to pre-pandemic ranges through the subsequent 12 months, simply 3.5% behind the 2019 ranges.

Nevertheless, the sustainability of the tourism enterprise in any vacation spot is an idea to be drastically impacted by authorities' rules that focus on macroeconomic elements for financial boom and development, both at once or indirectly. According to classical economics, the sectoral makeup of an economic system and its boom have been carefully correlated. The concept of zone-specificity in accomplishing financial boom is properly supported via literature ([Gabriel & Ribeiro, 2019](#)). Due to its potential to maximize go back to scale, robust synergies, and linkage effects, the tourism zone has an efficient shape that blessings developing economies ([Arjun et al., 2020](#)). Additionally, the macroeconomic variables' path drastically influences how extraordinary financial sectors, including the tourism enterprise, perform correctly. It is because macroeconomic variables function as a litmus check for the fitness of an economic system. It is supported by the endogenous boom model, which indicates that macroeconomic variables and tendencies motivate technological development as factors that inspire an inner financial boom. It is a blatant signal that the output of the tourism zone might reply to adjustments in macroeconomic variables, which includes inflation rate, hobby rate, and change rate, among others. For instance, the zone's potential to get admission to capital is prompted via the triumphing hobby rate, change rate, and different macroeconomic elements like cash delivery and inflation rate. However, extra latest proponents of Solow's speculation have disputed this view, stating that the path of macroeconomic variables has little to no effect on the manufacturing of financial sectors. The argument necessitates this look to analyze tourism zone output overall performance because it pertains to Nigeria's macroeconomic variables. Therefore, the look is predicted to reply to the study's query of whether or not there exists nexus between the tourism zone and macroeconomic signs in Nigeria.

## Literature Review

### *Theoretical Underpinnings*

The tourism-led growth speculation (TLGH) placed forth through [Balaguer & Cantavella-Jorda \(2002\)](#) posits that growing global tourism sports has a tremendous effect on the economic system. This speculation affords a theoretical and empirical justification for the correlation between inbound tourism and the financial boom. As a result, tourism generates forex that could make used to buy a capital device to supply items and services, stimulating the economic system. A nation's financial boom should be supported by the earnings generated by

the tourism industry. As such, global tourism may be considered a non-conventional export, which shows a supply of earnings or a likely strategic component for boom and development (Chang et al., 2010). This stance affords a theoretical connection between tourism and the financial boom. It is rooted within the export-led growth principle (ELGH), which holds that a financial boom may be created by including extra labour and capital in the economic system and boosting exports (Rasool et al., 2021).

The endogenous boom principle holds that the long-run boom of an economic system is primarily based totally on endogenous forces in preference to exogenous factors. As such, a system's inner approaches force a financial growth. The principle contends that long-time period boom is dictated through the version, and hyperlinks will increase in output in line with capita to financial savings and performance, with performance on account of education, diversification, privatization, liberalization, stabilization, and robust capital marketplace development, among others. According to the principle, coverage selections can affect long-time period boom rates. Countries with excessive degrees of performance, an appropriate financial structure, and solid financial coverage commonly revel in quicker financial boom (Egbulonu & Ajudua, 2017). The principle diagnosed the significance of critical sectors for the financial growth, with the connection between the overall performance of those sectors (tourism region inclusive) and the behaviour of macroeconomic variables being key to the growth.

The input-output framework principle tends to explain the relationships among one-of-a-kind financial sectors (Hasudungan et al., 2021; Malba & Taher, 2016; Miller & Blair, 2009). Hasudungan et al. (2021) in Indonesia discovered the tourism region's position regarding ahead and backward linkages, such as different financial sectors. They look at centres in the tourism region within the context of the hospitality enterprise. The authors applied the input-output approach and traced the econometric back-and-forth problems of the tourism region with the Error Correction Model, using the 2010-2019 database from Statistics Indonesia. The locating confirmed that production output contributes considerably and definitely to the enterprise, even as tourism contributes considerably and definitely to authorities' retribution.

Undoubtedly, we may want to undertake those theories to look at Nigeria's Tourism Sector Output and Macroeconomic Variables. However, this has a look at is underpinned via way of means of the tourism-led growth hypothesis (TLGH), posited via way of means of Balaguer & Cantavella-Jorda (2002). It is because the principle specializes in nations seeking financial improvement possibilities via global exchange. In this vein, tourism may be a supply of global exchange via the inflow of travellers into the country.

### **Empirical Literature**

Matthew et al. (2021) studied the Interaction Effect of Tourism and Foreign Exchange Earnings on Economic Growth in Nigeria. Yusuff & Akinde (2015), in Tourism Development and Economic Growth Nexus: Nigeria's Experience, the researchers discovered that among the length of 2001 and 2013, there had been a growing fashion in worldwide vacationer arrivals between 2001 and 2010 and a vast drop from 2011. The observation found worldwide vacationer arrivals and powerful trade quotes relate to monetary increases within the quick and lengthy run. The observation included the length between 2000 and 2016. The variables taken into consideration have been the GDP increase rate, effective trade rate, the change stability in tourism, gross constant capital formation, tourism-forex profits interplay and overall labour force. The approach of estimation used became the completely changed everyday least squares (FMOLS). The empirical findings found that service change (%) of GDP had a terrible courting with GDP even as different variables contributed undoubtedly to monetary increase.

Considering tourism and the financial system of Nigeria: A synthesis of its contributions to GDP from 2005 – 2016, [Alamai et al. Ladi \(2018\)](#) hired descriptive data to approach investigating the developments in worldwide arrivals in Nigeria, Nigeria's worldwide vacationer receipts and according to cent extra in worldwide arrivals to profits generation. Findings discovered an annual growth in home participation in tourism and inner spending on vacationer offerings and products. [Tung \(2019\)](#) tested the impact of the change fee on overseas vacation arrivals in Vietnam. They have a look at blanketed the length from 2006 to 2018, and the variables used were overseas vacationer arrivals and the change fee. The dating among variables changed into testing the usage of Ordinary Least Squares regression and the Granger causality looks at it. Findings discovered that the change fee greatly affected worldwide vacationer arrivals in Vietnam the length beneath neath investigation. [Peace et al. \(2016\)](#) investigated the connection between the change fee and tourism output in Nigeria from 1995 to 2015 using VECM, the granger causality look at and the cointegration approach. The variables captured withinside the version had been tourism's contribution to GDP, tourism's contribution to employment, the actual powerful change fee and worldwide vacationer arrivals. Findings discovered that the Results discovered that change fee fluctuation had a terrible and significant impact on the tourism quarter output in length beneath neath have a look at. At the same time, [Ajudua et al. \(2021\)](#), the unit root use the ARDL Bound Test and the ECM, recommend an advantageous and great quick and lengthy-run dating exists among agriculture and financial boom. They have a look at additionally discovered a good and great dating among production and financial boom withinside the quick run and a trifling dating withinside the lengthy run. At the same time, tourism confirmed a trifling terrible dating withinside the quick run and advantageous dating withinside the lengthy run.

[Sharma et al. \(2019\)](#) studied the outcomes of trade price tendencies on global tourism calls in India and discovered that the hyperlink between the trade price and global tourism receipt turned into a terrible giant each withinside the brief and lengthy run. A have a look at with the aid of using [Asuquo et al. \(2016\)](#) followed OLS in their look at tourism's economic contributions to Nigeria's gross home product from 2000 to 2015 and discovered a giant effective dating among the economic contributions of tourism and gross home product. [Li et al. \(2013\)](#) followed the VECM technique of looking at the triangular causal dating amongst GDP, tourism and different decided macroeconomic variables. They look at its findings and found a bidirectional causality between economic boom, tourism receipts and health. At the same time, the causality among authorities' tourism expenditure, bodily capital, schooling and exports to the economic boom has been unidirectional.

From those have a look at's findings, tourism output and its contribution to the socioeconomic boom of countries have been established. However, the performance's tourism area of countries, like each different area, is related to the attributes of such nations' macroeconomic variables ([Vanegas, 2021](#)). These variables may also consist of inflation price, cash supply, hobby price, investment, and trade price, amongst others. Nevertheless, preceding research has not begun to appreciably hire those macroeconomic variables to check their dating with the tourism area's output of a growing country in West Africa, which includes Nigeria. Consequently, this has a look at turns into vital and seeks to reveal the correlation between tourism area output and macroeconomic variables in Nigeria.

### Research Methods

The initial description of the ex-post facto research is raised in this study because the dataset used was obtained from secondary sources. The variables used in this study are tourism sector output, interest rates, foreign currency exchange rates, inflation and the money supply. The model adopted for this research is ARDL. This study carried over from the model because initial investigations indicated that the data integrated into the order of zeros and ones. This model is used to determine the short-term and long-term relationships of each variable. The data was time series data covering 30 years (1991-2020). The primary sources of the dataset used in this study are; the Central Bank of Nigeria (CBN) statistical Bulletin and the National Bureau of Statistics (NBS). Therefore, based on known macroeconomic variables and examining their impact/influence on the output of the tourism sector, a mathematical functional connection among the dependent and independent variables is stated.

The ARDL model is specified thus as;

$$\Delta Y = \varphi_0 + \partial_1 Y_{t-1} + \partial_2 Y_{t-2} + \alpha_1 X_{t-1} + \sum_{I=1}^k \beta_{1i} \Delta Y_{t-1} + \sum_{I=1}^k \beta_{2i} \Delta Y_{t-2} + \sum_{I=1}^k \delta_{1i} \Delta X_{t-1} + \sum_{I=1}^k \delta_{2i} \Delta X_{t-2} + \mu_t \tag{1}$$

The  $Y$  and  $X$  are presumed exogenous variables that explain any variation in  $Y$ ,  $\alpha_0$  is the intercept,  $\alpha_1, \alpha_2, \alpha_3,$  and  $\alpha_4$  are output elasticities concerning individual input or macroeconomic factors, which are the parameter to be estimated. At the same time,  $\mu_t$  is the model's error term.

Equation 1 could be transformed as follows;

$$\Delta(TSO) = \varphi_0 + \partial_1 INT_{t-1} + \partial_2 INT_{t-2} + \alpha_1 FEX_{t-1} + \sum_{I=1}^k \beta_{1i} \Delta INT_{t-1} + \sum_{I=1}^k \beta_{2i} \Delta FEX_{t-2} + \sum_{I=1}^k \delta_{1i} \Delta INF_{t-1} + \sum_{I=1}^k \delta_{2i} \Delta MS_{t-2} + \mu_t \tag{2}$$

Where:

TSO = Tourism Sector Output proxied by tourism sector contribution to the GDP

INT = Interest Rate

FEX = Foreign Exchange Rate

INF = Inflation Rate

MS = Money Supply

Due to the difference in measurement scale, variables would be transformed into their logarithm form to compress the scales and thus avoid the problem of heteroskedasticity. Thus equation 2 becomes:

$$\Delta(LNTSO) = \varphi_0 + \partial_1 LNTSO_{t-1} + \partial_2 INT_{t-1} + \alpha_1 FEX_{t-1} + \sum_{I=1}^k \beta_{1i} \Delta INT_{t-1} + \sum_{I=1}^k \beta_{2i} \Delta FEX_{t-1} + \sum_{I=1}^k \delta_{1i} \Delta INF_{t-1} + \sum_{I=1}^k \delta_{2i} \Delta LNMS_{t-2} + \mu_t \tag{3}$$

Before evaluating the cointegration relationship, a unit root test was conducted to ensure the static nature of the variables used in this article. As a result, the estimated ARDL is given as follows;

$$\Delta(\ln TSO) = \alpha_1 + \sum_{i=1}^n \Psi_1 \Delta(\ln TSO)_{t-1} + \sum_{i=1}^n \Psi_2 \Delta(INT)_{t-1} + \sum_{i=1}^n \Psi_3 \Delta(FEX)_{t-1} + \sum_{i=1}^n \Psi_4 \Delta(INF)_{t-1} + \sum_{i=1}^n \Psi_5 \Delta(MS)_{t-1} + \phi_1 INT_{t-1} + \phi_2 FEX_{t-1} + \phi_3 INF_{t-1} + \phi_4 MS_{t-1} + \mu_{it} \tag{4}$$

For the variables in equation 4,  $\alpha_1$  is the constant,  $\Psi_1 - \Psi_4$  are the corresponding short-run coefficients, and  $\phi_1 - \phi_4$  are the relevant long-run coefficients.  $\mu_{it}$  is the mutually independent white noise residuals,  $\Delta$  signifies the difference operator,  $n$  is the lag length, and  $t$  is the period.

The ARDL model of equation 4 is specified as

$$\Delta(\ln TSO) = \alpha_1 + \sum_{i=1}^n \Psi_1 \Delta(\ln TSO)_{t-1} + \sum_{i=1}^n \Psi_2 \Delta(INT)_{t-1} + \sum_{i=1}^n \Psi_3 \Delta(FEX)_{t-1} + \sum_{i=1}^n \Psi_4 \Delta(INF)_{t-1} + \sum_{i=1}^n \Psi_5 \Delta(MS)_{t-1} + \Psi_1 \Delta ECM_{t-1} + \mu_{it} \tag{5}$$

The  $ECT_{-1}$  and gotten from the estimated co-integrated equation. The value of the lagged error correction term ( $\Psi_1$ ), which shows the speed of adjustment after macroeconomic shock, is expected to be statistically significant with a negative sign.

The a priori expectation of these estimates is also stated as follows:  $\alpha_1, \alpha_2, \alpha_3 < 0, \alpha_2$  and  $\alpha_4 > 0$ .

## Result and Discussion

**Table 1: Descriptive Statistics**

	TSO	INT	FEX	MS	INF
Mean	23.17500	2.598500	24.57500	41.70500	18.53700
Median	8.050000	2.575000	24.50000	43.45000	12.20000
Maximum-	71.30000	3.160000	40.00000	66.00000	72.80000
Minimum	0.700000	2.390000	12.00000	22.40000	5.380000
Std. Dev.	26.47042	0.126015	7.193578	11.92640	16.28594
Skewness	0.902593	2.326911	-0.129964	0.030369	1.792534
Kurtosis	2.134604	11.22666	2.093667	1.595834	5.388535
Jarque-Bera	6.679348	148.8933	1.481669	3.292286	30.92969
Probability	0.035449	0.000000	0.476716	0.192792	0.000000
Sum	927.0000	103.9400	983.0000	1668.200	741.4800
Sum Sq. Dev.	27326.64	0.619310	2018.155	5547.319	10344.04
Observations	40	40	40	40	40

Source: Authors' Computation via E-View 10. (2022)

The descriptive statistics towards the direction of the graphical illustration but in a more scientific manner. The mean value of tourism output was put at (23.18), directly followed by the mean value of interest rate and foreign exchange at (2.60) and (24.58), and the money supply and inflation rate mean values were (41.71) and (18.5) respectively. TSO's maximum

and minimum values are 71.3 and 0.7, respectively, with a very high standard deviation of 26.5. The standard deviation value was so because the disparity between the early years of the TSO growth rate and the later years was very high. It is so because the effect of macroeconomic variables was not pronounced at the early production stage when compared with the later stage.

The skewness of the dependent variable is highly skewed to the left, showing the adverse effect of current macroeconomic variables on the growth of tourism output as time passes. Also, the minimum value of TSO at 0.7 per cent is a testimony to the continuous fall in the growth level of output of TSO due to the poor level of the macroeconomic infrastructure, implying that the poorer the infrastructural level, the lower the growth rate of tourism output.

### Stationarity or Unit Root Test

**Table 2: Augmented Dickey-Fuller (ADF) and Philip Perron (PP) Unit Root Test Results**

Variables	ADF	5%	Prob.	I	PP	5%	Prob.	I
LnTSO	6.6890	2.998	0.0000	I(1)	6.672	2.998	0.0000	I(1)
INT	5.2641	2.998	0.0003	I(1)	5.686	2.998	0.0001	I(1)
FEX	3.2103	2.992	0.0317	I(0)	3.196	2.992	0.0328	I(0)
INF	6.1301	2.991	0.0000	I(0)	6.231	2.992	0.0000	I(0)
LMS	3.7884	2.998	0.0092	I(1)	3.7884	2.998	0.0092	I(1)

Source: Authors' Computation via E-View 10. (2022)

Table 2 shows the unit root test result of the time series variables used in the study. The result of ADF and Phillips-Perron (PP) indicate that tourism sector output (TSO), interest rate (INT), and money supply (MS) are integrated of order one I(1), that is, this variable became stationary after first differencing. In contrast, the foreign exchange rate (FEX) and the inflation rate of order zero I(0) are stationary at this level.

In particular, Johansen's approach would preclude mixing the variables I(0) and I(1). This provides a convincing argument in favor of using the limit test approach or the ARDL model proposed by Pesaran et al. (2001).

### Cointegration Test

**Table 3: ARDL Bounds Test (ARDL Cointegration Test)**

F-Bound Test		Null Hypothesis: No levels of relationship		
Test Statistics	Value	Significant	I(0)	I(1)
Asymptotic: n=1000				
F-Statistic	6.408033	10%	2.45	3.52
K	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06

Source: Authors' Computation via E-View 10. (2022)

Table 3 depicts the ARDL Bound test's result that measures the estimated model's long-run relationship among all included variables. This result indicates a long-run connection between all the variables in the model. It is because of comparing the statistical values between the F-statistics value and the critical Bound values at a 5 % in significance level. The comparison reflects that the F-statistics value is greater than the critical values at 5 per cent



for both I(0) Bounds and I(1) Bounds. Therefore, this research reject the null hypothesis of no long-run relationship and accept the alternative hypothesis as stated in the Bound test.

Furthermore, in a more numerical expression, the bounds test F-statistic of 6.408033 is more significant than 4.01, the critical value of the upper bound I(1). Based on this, the null hypothesis of no cointegration is rejected, implying evidence of a long-run relationship among the variables. With the establishment of the long-run relationship, the long-run coefficients of the parameters were then estimated, as shown below.

**Table 4: Long Run Equation**

LEVELS EQUATION				
DEPENDENT VARIABLE: LNTSO				
VARIABLE	COEFFICIENT	STD. ERROR	t- STATISTICS	PROBABILITY
INT	-0.006079	0.026221	0.251819	0.8198
FEX	-0.049025	0.010143	-4.833331	0.0002
INF	-0.371128	0.136008	-2.728726	0.0155
LNMS	1.956245	0.436717	-4.479435	0.0004

EC=LNTSO – (-0.006079\*INT – 0.0490\*FEX – 0.3711\*INF – 1.9562\*MS)

Source: Authors’ Computation via E-view (2022)

The long-run equation results show that a unit increase in interest rate would lead to a 0.0061 unit decrease in the tourism sector’s contribution to GDP in the long run. The p-value of 0.8198 means that the contribution of interest rate (INT) has no significant long-run effect on the tourism sector’s contribution to GDP. A unit increase in the foreign exchange rate (FEX) will lead to a 0.0492 unit decrease in the tourism sector’s contribution to GDP in the long run. The P-value of 0.0002 indicates that the foreign exchange rate has a significant negative long-run relationship with the tourism sector’s contribution to GDP. The coefficient of -0.3711 for the inflation rate implies that a unit change in the inflation rate will cause a change of 0.3711 units in the tourism sector contribution to GDP in the opposite direction in the long run. Probability of 0.0155 also shows that INF significantly negatively affects the tourism sector’s contribution to GDP in the long run. The coefficient of 1.9562 for MS implies that a unit increase in money supply will cause the tourism sector’s contribution to GDP to increase by 1.9562 units in the long run. The P-value of 0.0004 shows that money supply has a significant positive long-run effect on the tourism sector’s contribution to GDP.

**Table 5: The Autoregressive Distributed Lagged Model (ARDL) or Short Run Model**

Dependent Variable: D(LNTSO))

Method: Least Squares

Date: 03/09/22 Time: 14:49

Sample (adjusted): 1984 2021

Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.082542	0.226008	-0.365216	0.7181
D(LNTSO(-1))	0.332877	0.544261	2.611614	0.0465
D(LNTSO),2)	0.224751	0.163571	1.374029	0.1821
D(INT(-1))	-0.230161	2.178159	0.291884	0.5617
D(FEX)	0.076861	0.090261	2.851540	0.0029

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 Dependent Variable: D(LNTSO))

Method: Least Squares

Date: 03/09/22 Time: 14:49

Sample (adjusted): 1984 2021

Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FEX(-1))	-0.024294	0.097203	3.249930	0.0005
D(INF)	-3.443601	0.065408	-0.614935	0.5444
D(INF(-1))	-0.019213	0.093998	-4.204403	0.0398
D(LN(MS),2)	2.348425	4.460347	3.526512	0.0043
D(LN(MS(-1)))	4.291915	0.330256	3.678000	0.0034
ECT(-1)	-0.352526	4.537629	-3.452139	0.0033
R-squared	0.748027	Mean dependent var	0.208762	
Adjusted R-squared	0.727960	S.D. dependent var	0.186586	
S.E. of regression	0.198164	Akaike info criterion	0.129602	
Sum squared resid	0.942458	Schwarz criterion	0.436396	
Log-likelihood	15.39764	F-statistic	4.659669	
Durbin-Watson stat	2.024635	Prob(F-statistic)	0.001317	

Source: Authors' Computation via E-view 10 (2022)

The short-run dynamics of the model are presented in Table 5 above. The result shows that the combined effect of INT, FEX, INF and LNMS within the period under study is approximately 75% (R-Squared 0.745027). The adjusted R-Squared value of (0.727960) implies that if any missing variable in the current model is added to form a new model, the current explanatory variables will still jointly explain approximately 73% variation in tourism output in the new model. Also, the F-statistics value of 4.659669 and its probability value (0.001317) suggest that the overall estimated model is a good fit and robust. In contrast, the value of Durbin Watson implies the absence of serial correlation in the estimated model.

On the other hand, interest rate coefficient is -0.23161, which means that a unit change in the interest rate will cause a negative change of 0.230161 units in the tourism sector's output growth rate. Furthermore, the 23% interest rate is not favourable to the tourism sector because it constitutes divestment to the sector, at least in the short run. The p-value of 0.5617 implies that interest rate has no significant influence on the short-term output growth rate of the tourism sector. Also, the foreign exchange rate has a negative short-run impact on the tourism sector's output growth rate ( $b = -0.024294$ ,  $P < .05$ ). It shows that a unit change in the foreign exchange rate will cause a negative change of 0.024294 unit in tourism sector's output growth rate. The coefficient of the inflation rate is -3.4436, which implies that a unit increase in the inflation rate will cause a decrease of 3.4436 units in the tourism sector's output growth rate. The p-value of 0.0005 implies that inflation negatively affects the tourism sector's output growth rate in the short run. The coefficient of the money supply is 4.291915, which implies that a unit increase in the money supply will cause an increase of units in 4.291915 the tourism sector's output growth rate. The p-value of 0.0034 implies that the money supply positively affects the tourism sector's output growth rate in the short run.

After estimating both the short and long-run connections among the variables, it's imperative to bandy the speed of adaption from short-run drift to the long run equilibrium using the ARDL model. ECT measures the adaption towards the long run equilibrium. Positive ECT indicates divergence, while negative shows desirable confluence (Nkoro & Uko, 2016). The ECT have value of -0.352526 implies that the speed of adaptation to long run equilibrium is 35. That is 35 of the disequilibrium in the former period is being acclimated for in the present periode and is statistically signifikan ( $P < 0.5$ ).

**Model Diagnostic Check**

**Table 6a: Breusch-Godfrey Serial Correlation LM Test:**

F-statistic	0.042618	Prob. F(1,14)	0.8394
Obs*R-squared	0.072838	Prob. Chi-Square(1)	0.7872

**Table 6b: Heteroskedasticity Test: Breusch-Pagan-Godfrey**

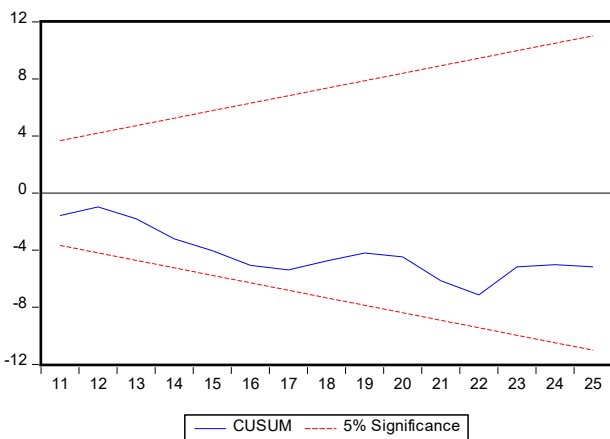
F-statistic	0.513733	Prob. F(8,15)	0.8281
Obs*R-squared	5.161560	Prob. Chi-Square(8)	0.7402
Scaled explained SS	6.762617	Prob. Chi-Square(8)	0.5624

Source: Authors' Computation via E-view (2022)

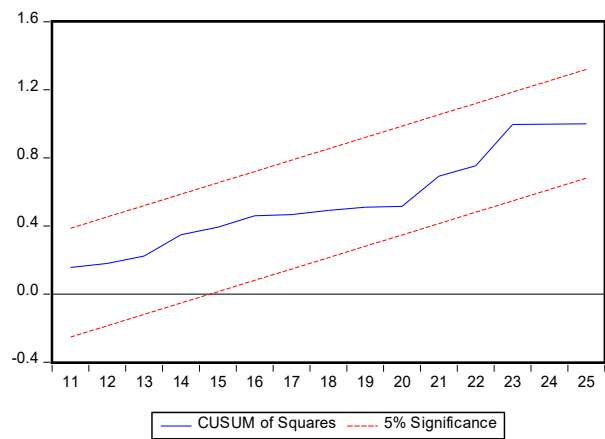
The residual diagnostic test was performed for serial correlation and heteroscedasticity. The result of the serial correlation test in table 5a was done using the BGodfrey Serial Correlation LM test. It tests the hypothesis that no serial correlation is present in the residual. The result gives the LM test probability value of 0.8394, which means that it can't reject the null hypothesis of no serial correlation. The Breusch-Pagan-Godfrey heteroscedasticity test (table 5b) has a probability value of 0.8281. It implies no residual heteroscedasticity.

**Stability Test**

This test was conducted using CUSUM and CUSUM squares test at a 5% significance level. The results, Figures 1 and 2 below, show that the CUSUM and CUSUMSQ plots stay within the 5% critical bounds, which implies that all the parameters employed in the model are stable during the period under study. It shows that the estimated ARDL model is stable and suitable for making long-run decisions.



**Figure 1: CUSUM Stability Test**



**Figure 2: CUSUM Square Stability Test**

Source: Data Processed (2022)

## Conclusion

This study examines the impact of macroeconomic variables on the tourism sector output in Nigeria. The study adopted the ARDL model to examine the nexus between the tourism sector output and some selected macroeconomic variables as seen in the specified model with annual frequency data set spanning 1991 to 2020 utilized. Results suggest that interest rate, as expected, had a negative relationship with tourism sector output proxied by tourism sector contribution to the GDP though not significant. Also, foreign exchange and inflation rates had a negative and significant relationship with tourism sector output, while money supply had a positive and statistically significant relationship with tourism sector output.

Grounded on the findings, it is recommended that a should put on checkk the interes rate, foreign exchange rate, and affectation rate as they impact the performance of the tourism sector. A high-interest rate impedes investment and will stymie the capability to adopt and invest for expansion. Lowering the exchange rate will appreciatively impact the tourism sector as it will boost the importation of shops and ministry to support the sector's affair, which will prop in attracting transnational excursionists. Affectation should also be controlled while allocation to the sector should be bettered.

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