The Impact of Passengers' Traffic on Exchange Rate and Economic Growth in Nigerian Aviation Industry

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A B S T R A C T

The aim of this study is to examine the impact of passengers' traffic on Exchange Rate (ER) and economic growth in Nigerian aviation industry. This study adopts an ex-post facto research design, a systematic empirical inquiry in order to carry out the research. Secondary data was obtained from the Federal Airports Authority of Nigeria (FAAN) and National Bureau of Statistics (NBS). The study employed trend analysis on the time series data and regression analysis to explore the cause-and-effect relationship among variables. The result showed that the trend of exchange rate and aviation contribution to Gross Domestic Product (GDP) have been on increase over certain periods. Hence, the linear trend line shows a steady increase in the pattern of exchange rate and economic growth over the sample period of 2000 to 2020 with R-squared values of 0.714 and 0.824, respectively indicating a good fit of the line to the data. The regression analysis revealed that Passengers' Traffic (PT) has a positive impact on ER and economic growth. Thus, with a T-statistic of 3.296 and probability of 0.004, it indicates a statistically significant effect on the dependent variable (i.e. Exchange Rate). Also, with a T-statistic of 6.119 and probability of 0.000, it indicates a statistically significant impact on the dependent variable (i.e. Economic Growth).

Keywords: Passengers' traffic, Exchange rate, Economic growth, Aviation industry.

1. Introduction

Air transport, field infrastructure, economical and safe airline services and worldwide air transport networks are essential support for commercial touristry [1]. In 2014, over half of all international tourists (54%) journey was by air [2]. Aviation industry plays an important role in a destination's economy, as well as the hospitality sector and the other way around [3]. Touristry

has excited the event of charter airliners [4], opened new routes and business markets, hence, influenced the event of destinations especially as gateways, hub-and-spoke or layovers [1]. Aviation industry serves as a basic mode of transportation for in-bound and out-bound recreational trips [2] and a vital impact on route expansion. Aviation industry and touristry reciprocally relies on each other [6, 7] with airliners typically concerned about the designing and development of tourer destinations whereas touristry destinations might expend time and energy on native airports or the event of latest routes [5]. Foreign airlines treaty has an effect on tourer destinations by influencing airfares and total journey period, connectivity and collaborative advancement [8]. It is therefore a herculean task to maximized or sustained air transportation operations and business unless there is demand for its services; whereas, the estimation of anticipated future demands is a key determinant in planning and projecting aviation industry performance [9].

Overtime, the Nigerian economy has witnessed several foreign exchange fluctuations, significantly depreciation in the foreign exchange market with inflation as an attendant effect [10]. ER fluctuations has positive and concise effect on African nation's foreign non-public investment which corroborate the fact that Foreign Direct Investment (FDI) investment in Nigeria is set by foreign exchange likewise as technology, entrepreneurial skills and supply of capital [11]. In line with Ume et al. [12], based on theory, there appear to be no relationship between the par value of charge per unit and foreign reserve within the African nation context only if foreign reserves are dollar denominated thence might not be impacted by par value changes within the local ER. Conversely, the link with real ER offers a distinct supposition since it is local value dependent. This clearly reveals the fact about the disclosed relationship between the real variant as opposition to the par value variant. It is a general knowledge even in literature that real charge per unit may be a favored alternative in foreign exchange connected discourses because it has an adjustment for value. Within the analysis of Egbunike et al. [13], there was no concise impact for interest rate and foreign ER, however, an impact for rate of inflation and value rate on ROA was established. In line with Barguellil et al. [14], the impact of ER volatility relies on the charge per unit regimes and money openness, that is, volatility is further harmful once countries harness versatile charge per unit regimes and money openness. Also, Lilley et al. [15] asserted that the condition of U.S foreign bond acquisition to ERs is basically driven by investment in dollar-denominated assets instead of only by foreign currency exposure. Thus, the impact of ER volatility has in one way or the other contributed to airport concessioning. According to Adeniran and Gbadamosi [16], airport concessioning has the capacity to enhance efficiency of airport operation; reduce cost of airport services to stakeholders; decrease cost to the government for the support of airport sector; and attract private sector participation to free public resources for public services.

Literature has shown that currency ER play a chief role in airline operation and overall value aggressiveness [17]. The perception that a nation is pricey proves to be a particular form of selling challenge. Within the case of African nation, the influence of foreign exchange on the amount of

international arrivals to Nigeria is additionally important to notice. Based on the foregoing, researches have studied the link between capital flight and foreign exchange Nigeria; they concentrate on Nigeria's gross domestic product rate and oil, conjointly on foreign currencies and foreign direct investment that don't seem to be specific to aviation industry operation. The studies associated with aviation industry were restricted to oil costs, jet fuel value on fare and domestic tourism demand. Studies have extensively examined the impact of economic factors on firm performance and/or a nation economy [15, 18, 19, 20, 21, 22, 23, 24]. However, there is very little empirical study on the impact of passengers' traffic on ER and GDP. Hence, this study is set to examine the impact of passengers' traffic on ER and economic growth in Nigerian aviation industry.

2. Literature Review

ER (i.e. charge per unit) is referred to as the proportion or rate at which foreign currency per unit of two currencies may be traded, that is, exchange to native or domestic currency [25]. Monetary interchange systems that do not seem to be tactically or unintended has the propensity to result in associated enlargement or contraction in local currency volume with a transmission impact on financial policy and alternative financial aggregates. In Nigeria, before the exchange management act of 1962, monetary interchange was non-public sector driven, that is, left to the agents of demand and supply; with primarily foreigners doing business in the Federal Republic of Nigeria while their monies are saved in their banks outside the country. Agricultural exports were largely the details of monetary interchange receipts since agriculture was the dependence of the Nigerian economy. The former Nigerian currency, that is, the Nigerian pound was designated against British pound that made it extremely easy convertible currency. This act prevented the progress of a functional monetary interchange market in Nigeria till 1958 when the Central Bank Nigeria (CBN) was established with the attendant centralization of foreign exchange authorities. It is within the jurisdiction of the function of the CBN as the central financial authority that the necessity to boost a local ER market became remarkable. The discovery of oil in large marketable quantity in Nigeria in the 1970s along with the increase in crude oil value contributed to the growth in foreign exchange and monetary reverses.

Overtime, there has been a dwindling within the crude oil worth in the foreign market that has contributed to instability in the nation's external reserves with its attendant impact on the exchange price of Nigerian monetary unit (Naira) particularly to the dollar. The charge per unit instability emerged to be distinguished around the 1980's particularly in 1986, following the structural adjustment program and therefore the sequent deregulating of the monetary interchange market resulting in the introduction of the Second-tier Foreign Exchange Market (SFEM) that is, the parallel exchange system. In 2015, the Nigerian monetary unit (Naira) charge per unit to a dollar was #199 however, the Nigerian monetary unit (Naira) depreciated to #360 to a dollar in 2018 and currently around #385 to a dollar (2020). It is worthy to note that

Nigeria with an economic feature of high-level international trade exposure is an import reliance economy in terms of subsistence and also an export reliance economy in terms of the general public revenue design.

The Nigerian aviation industry got its initial recognition within the era of West African Airways Corporation (WAAC) that was an airline which worked from 1946 to 1958. WAAC was conjointly run by the governments of Britain's four West African territories, that is, the Republic of Gambia, the Federal Republic of Nigeria, Ghana and Sierra Leone. Since 1971 to this time, numbering about sixty one airlines had operated in the airfield terminals of Nigeria. These include Okada Air (1982 – 2002); ADC Airline (1984 – 2006); AfriJet (1998 – 2009); Albarka Air (1999 – 2005); Bellview Airlines (1992 to 2010); Chanchangi Airlines (1994 – 2012) and First Nation Airline (2010 – 2018) just to mention a few. On the 14th of June, 2006, Arik Air got two new Bombardier CRJ-900 airplanes to fly local routes within Nigeria and at intervals the African continent from 2006. The proclaiming of the 'Tear Rubber' airplane was huge and it improved the status quo of the airline that was envisaged to alter the demeanor of the air transport industry within the country. However, the story became different once the Federal Government via the Asset Management Corporation of Nigeria (AMCON), began to manage Arik Air in February 2017, this is because the airline was aforementioned to be bankrupt and vulnerable to closure. AMCON asserted that the national carrier that was responsible for transporting about 55 percent of air passengers within the country had been experiencing troublesome times, as a result of its poor governance management, non-stable operational issues, inability to remunerate employees and serious debt impediment, among alternative problems. However, as the Federal Government took charge of the airline operation in 2017, the national carrier has been experiencing several operational and managerial challenges and Its employees has down-sized over the period of time because of poor salary payment amidst other welfare problems.

Several empirical studies have investigated the impact of charge per unit volatility on the political and economy performance (economic growth) each in theory and through empirical observation. Different economic process indicators such as domestic investments have conjointly been investigated [26]. Edwards and Levy-Yeyati [27] unconcealed that charge per unit volatility impacts absolutely on economic growth through its result on the adjustment process to shocks. This assertion has been supported by Shafi et al. [28] as they affirmed that charge per unit volatility is absolutely significance with growth. Danmola [29] examined the consequences of charge per unit volatility on the Nigerian political and economy factors; the findings of the study disclosed that volatile charge per unit features a positive result on FDI, GDP, and trade openness with a negative result on the inflationary rate within the country. More so, Jakob [30] through empirical observation revealed that there is a positive and important correlation between the steady charge per unit and growth in GDP. Likewise, Dickson and Andrew [31] analyzed the effect of charge per unit volatility on trade imports in the Federal

Republic of Nigeria. With the help of a standard error correction technique, the results showed that charge per unit volatility was absolutely associated with import/export.

Other studies have rather tested the presence of a negative relationship between charge per unit volatility and a few political and economy factors which may have an effect on economic growth like international trade, investment and employment [14, 32]. As an example, the volatile charge per unit will have negative impact on economic process through its effect on the most determinants of the economic activity, like trade flows, exports/imports, Inflation, employment and FDI. Relating to these points, studies have shown that volatile charge per unit usually result in a decrease within the volume of international trade [5]. Also, Tenreyro [33] discovered a negative relationship between charge per unit volatility and exports in developing countries. Similarly, the study of Khosa et al. [34] revealed that important negative result exists between charge per unit volatility and also the performance of exports. Also, David et al. [35] examined the impact of charge per unit fluctuations on Nigerian producing industry; using multivariate analysis, their results revealed a negative relationship between the performance of producing industry and charge per unit volatility.

Volatility refers to how charge per unit is settled on supply and demand of local currency vis-à-vis to foreign currency. Charge per unit volatility can have an effect on the quantity of imports, exports, reserve money; policy selections and disturbs the distribution of productive resources and also the balance of payments. Charge per unit volatility provides possibilities to local investors to get higher profits and also invest in foreign currency. Based on literature, there are three perspectives on the impact of the fluctuation of charge per unit on economic growth as presented by scholars: the first perspective is that the depreciation of foreign exchange has an associated supplementary impact on economic growth [36, 37]. In the study on impact of economic growth with the depreciation of real foreign exchange using the sample of developing countries, Rodrik [38] found that the depreciation of the real foreign exchange was helpful to the trade unit and it is capable of boosting the investment returns for the trade unit and also cut down the price of system and market deformations; hence, the devaluation of the real exchange value can hype gross domestic product through the supplementary impact on economic growth. The second perspective is that the depreciation of charge per unit features a "contractionary effect" on economic growth" [39]. However, Wang et al. [40] concur that the depreciation of the foreign exchange can lead to the "contractionary effect" principally through four ways namely; reducing product supply, inflicting inflation, resulting in foreign drain and escalating debt burden. The third perspective holds that the impact of foreign exchange depreciation on economic growth is unsure [41]. Bernard [42] tested whether disease outbreaks contain valuable information to enhancing the prediction of ER return and volatility. Data showed that the COVID-19 outbreak has been rapid and deadly. Using the total number of infections per million, the researcher demonstrated that COVID-19 has better predictive power over volatility than over returns for a one-day ahead forecast horizon.

3. Methodology

This section address how data and the information used in this study was gathered and analyzed. It also deals with the method of data collection and types of information generated.

3.1. Data Collection

The data set applied in this study to represent aviation traffic record, ER and aviation contribution to National GDP as annual time series data from 2000 to 2020. These secondary data were obtained from the Federal Airports Authority of Nigeria (FAAN), CBN Statistical Bulletin and National Bureau of Statistics (NBS). The data set used in this study was mainly time series data which are quantitative in nature.

3.2. Data Analysis

This study adopts an ex-post facto research design; a systematic empirical inquiry in order to examine the trend of ER, aviation contribution to Nigeria Gross Domestic Product (2000-2020) and also the impact of passengers' traffic on ER and economic growth. The study employed trend analysis on the time series data and regression analysis to explore the cause-and-effect relationship among variables. This section presents the methodology used in the analysis of the variables which relies on the parametric statistical techniques.

3.2.1. Trend analysis

The least square method also known as trend line is suitable to forecast data with random variation and trend. The model for least square method is presented thus:

$$Y = a + bx. \qquad (1)$$

Where,

Y = forecast,

x = year,

a = intercept,

b = trend (slope).

3.2.2. Multiple regression model

Multiple regression is a more sophisticated extension of correlation and is used when one wants to explore the predictive ability of a set of independent variables on one continuous dependent measure. Multiple regressions allow a more sophisticated exploration of the interrelationship

among a set of variables i.e. it is used to explore the cause-and-effect relationship among variables. In order to examine the impact of passengers' traffic on ER and economic growth, the specified empirical models are thus;

Exchange Rate (ER) = PT (Passengers' Traffic),

$$ER = \alpha + \beta_1 (PT) + ... + Ui. \qquad (2)$$

Gross Domestic Product (GDP) = PT (Passengers' Traffic)

$$GDP = \alpha + \beta_1 (PT) + ... + Ui. \qquad (3)$$

Where

α = Intercept;

$\beta_{1....n}$, = Parameters;

Ui = Stochastic disturbance term or error term which captures other economic indicators;

PT = Passengers' traffic;

GDP = Gross Domestic Product;

ER = Exchange Rate fluctuations.

4. Results and Discussion

4.1. Data Summary of Parameters

Table 1 depicts the ER, aviation contribution to GDP and the aviation traffic flow over the sample period 2000 to 2020. This summary data reveals the real nature of how ER, aviation contribution to GDP and aviation traffic flow has increased and/or decreased overtime owning to several factors. Thus, foreign ER has appreciated and depreciated at certain periods, aviation contribution to GDP has consistently increased overtime until in the period (2020) when it declined, also, aviation traffic flow has steadily increased overtime but it experienced reduction in the period (2020). These declines experienced in the aviation contribution to GDP and aviation traffic flow has been due to the COVID-19 pandemic.

Table 1. Data summary of parameters.

Year	Exchange rate	Aviation contribution to GDP (N' billion)	Aviation traffic Flow
2000	102.1052	9.20	1,253,376
2001	111.9433	10.53	1,469,331
2002	120.9702	14.03	1,589,382
2003	129.3565	15.37	1,658,059
2004	133.5004	16.76	1,950,826
2005	132.1470	18.29	2,124,577
2006	128.6516	22.41	2,311,326
2007	125.8331	25.44	2,835,395
2008	118.5669	25.75	2,943,682
2009	148.8802	29.20	3,000,660
2010	150.2980	32.67	3,208,919
2011	153.8616	56.49	3,559,455
2012	157.4994	65.61	3,906,188
2013	157.3112	76.91	5,146,915
2014	158.5526	84.41	4,599,374
2015	193.2792	95.74	4,185,214
2016	253.4923	94.50	4,184,250
2017	359.9970	105.90	4,069,589
2018	364.5020	149.40	4,400,450
2019	360.0594	198.62	8,487,698
2020	385.8586	120.50	2,915,770

Source: National Bureau of Statistics (2020) and Central Bank of Nigeria (2020)

4.2. Exchange Rate of the Naira

Figure 1 shows that between 2000 and 2004, the Nigerian naira depreciated by more than 27 percent against the United States of American's dollar. In the second period (2005 to 2008), the Nigerian naira appreciated by more than 11 percent against the United States of American's dollar while the third (2009 to 2016) saw drastic depreciation of the naira by about 84 percent. Therefore, when the various periods are compared, it shows that it was only in the second period (2005 to 2008) that naira value appreciated against the US dollar after which it has been depreciating with amazing rates. In the year 2015, the naira ER to a dollar was #193 but suddenly the naira went on a free fall until it found itself playing around #364 (2018) to a dollar and presently around #385 (2020) to a dollar. It should also be pointed out that Nigeria as an economy has a high-level international trade exposure given that it is an import-dependent economy in terms of subsistence and an export-dependent economy in terms of the public revenue architecture.
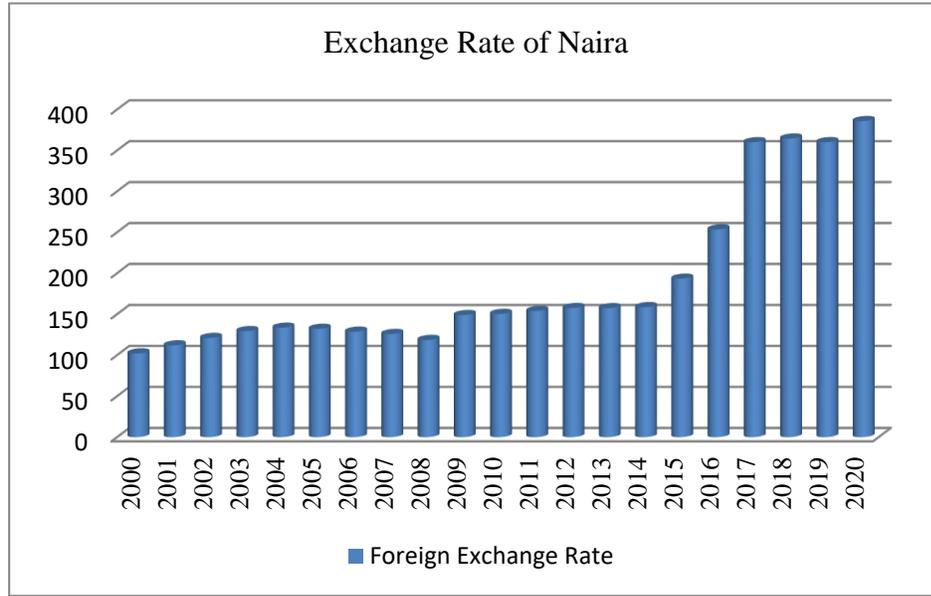
Figure 1. ER of Naira.

4.3. Aviation Contribution to GDP

Figure 2 reveals that the least aviation contribution to Nigeria Gross Domestic Product was in 2000 and 2001 with values of 9.2 billion and 10.53 billion respectively. Between the period 2002 and 2009, the aviation contribution to GDP steadily increased by about 112 percent. In the period (2010 to 2015), aviation contribution to GDP experienced drastic increase by more than 141 percent while there was declination in the contribution in 2020. Thus, aviation contribution to GDP has been on increase overtime until 2020 when a declination was experienced as a result of COVID-19 pandemic.

4.4. Trend of Exchange Rate and Aviation Contribution to GDP

According to ***Figure 3***, the trend of foreign ER and the contribution of aviation industry to Nigeria GDP have been on increase over period simultaneously. Meanwhile, between 2006 and 2009, the pattern dropped below the trend line but thereafter started to increase again until the period 2020 which experienced a decline. Hence, the linear trend line shows a steady increase in the pattern of foreign ER and the contribution of aviation industry to Nigeria GDP over the sample period 2000 to 2020. In the same vein, the respective R-squared values of 0.714 and 0.824 explain a good fit of the line to the data.
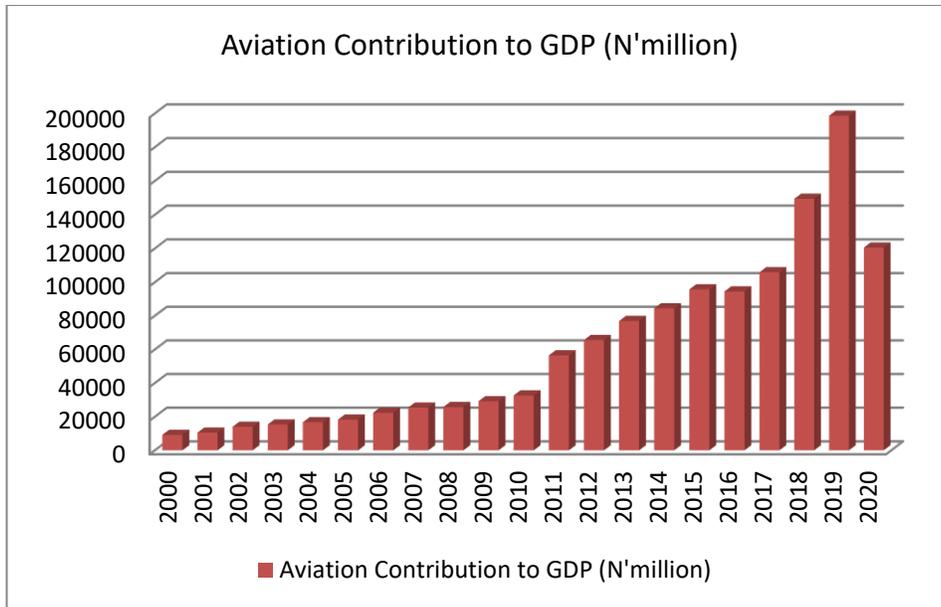
Figure 2. Aviation contribution to GDP.
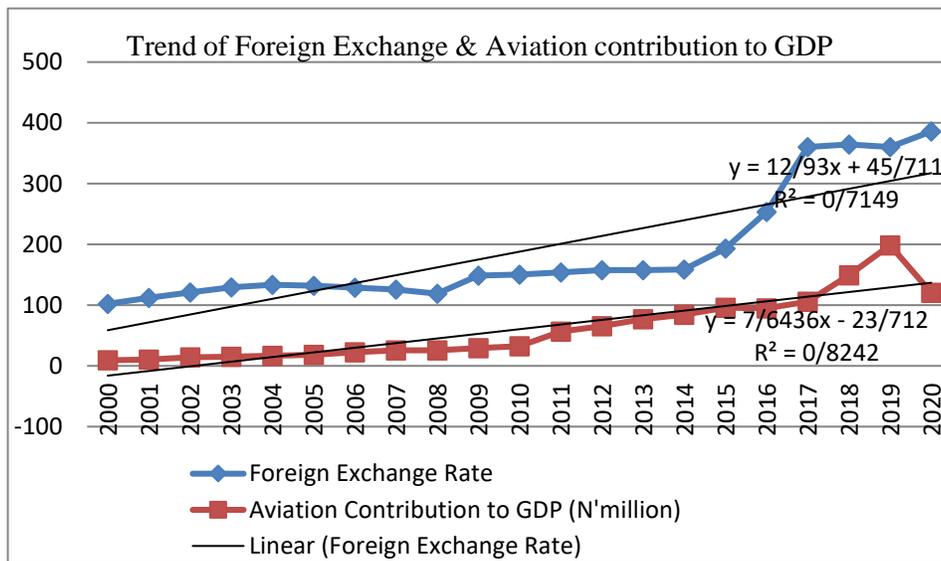
Figure 3. Trend of exchange and aviation contribution to GDP.

4.5. Impact of Passengers' Traffic on Exchange Rate

Dependent variable: Exchange Rate (ER);

Independent variable: Passengers' Traffic (PT);

Method: Ordinary Least Square;

Period of observation: 21 years;

$ER = \alpha + \beta_1 (PT) + ... + Ui;$

$ER = 71.885 + 0.073(PT);$

$S.E = (39.073) \quad (0.100);$

$T = (1.840) \quad (3.296).$

The result in *Table 2* shows the regression analysis of the impact of Passengers' traffic on ER where the variable of PT has a positive impact on ER. The value of coefficient is 0.073 which indicates that a change of 10% in Passengers' traffic will lead to a change of 0.73% in the ER. With a T-statistic of 3.296 and probability of 0.004, it indicates a statistically significant effect on the dependent variable (i.e. ER). The coefficient of determination (R-square) and adjusted R-square are high at 0.780 and 0. 0.608 respectively which implies that about 78.0% in ER can be explained by changes in Passengers' traffic while about 22.0% can be explained by factors outside this model and if adjusted for degree freedom then 60.8% variation in ER is explained by the independent variable, that is, Passengers' traffic.

Table 2. Effect of passengers' traffic on ER.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.780ᵃ	. 608	.574	77.64629

a. Predictors: (Constant), Passengers' traffic
b. Dependent Variable: ER

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	T	Sig.
(constant)	71.885	39.073	.780	1.840	.081
Passengers' traffic	.073	.100		3.296	.004

a. Dependent Variable: ER

4.6. Impact of Passengers' Traffic on Aviation Contribution to GDP

Dependent variable: Aviation contribution to GDP;

Independent variable: Passengers' Traffic (PT);

Method: Ordinary Least Square;

Period of observation: 21 years;

$GDP = \alpha + \beta_1 (F_{EXC}) + ... + Ui;$

$GDP = 31.672 + 0.058 F_{EXC};$

S.E = (18.055)   (0.121);

T = (3.696)   (6.119).

The result in *Table 3* shows the regression analysis of the impact of Passengers' traffic on Aviation contribution to GDP where the variable of PT has a positive impact on Aviation contribution to GDP. The value of coefficient is 0.058 which indicates that a change of 10% in Passengers' traffic will lead to a change of 0.58% in the Aviation contribution to GDP. With a T-statistic of 6.119 and probability of 0.000, it indicates a statistically significant impact on the dependent variable (i.e. Aviation contribution to GDP). The coefficient of determination (R-square) and adjusted R-square are high at 0.869 and 0.755 respectively which implies that about 86.9% in Aviation contribution to GDP can be explained by changes in Passengers' traffic while about 13.1% can be explained by factors outside this model and if adjusted for degree freedom then 75.5% variation in Aviation contribution to GDP is explained by the independent variable, that is, Passengers' traffic.

Table 3. Effect of passengers' traffic on aviation contribution to GDP.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.869[a]	.755	.742	26.53864

a. Predictors: (Constant), Passengers' traffic

b. Dependent Variable: Aviation contribution to GDP

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(constant)	31.672	18.055	.869	3.696	.028
Passengers' traffic	.058	.121		6.119	.000

a. Dependent Variable: Aviation contribution to GDP

5. Conclusion and Recommendations

The aim of this study is to examine the impact of passengers' traffic on ER and economic growth GDP. Thus, the findings of this study revealed that over the sample period 2000 to 2020, ER has appreciated and depreciated at certain periods, the contribution of aviation to the nation's GDP has consistently increased overtime until in the period (2020) when it declined, also, aviation traffic flow has steadily increased overtime but it experienced reduction in the period (2020). These declines experienced in the aviation industry contribution to GDP and aviation traffic flow has been due to the COVID-19 pandemic. When the various periods are compared, it shows that it was only in the second period (2005 to 2008) that naira value appreciated against the US dollar after which it has been depreciating with amazing rates. In the year 2015, the naira ER to a dollar was #193 but suddenly the naira went on a free fall until it found itself playing around #364

(2018) to a dollar and presently around #385 (2020) to a dollar. Thus, the contribution of aviation industry to Nigeria Gross Domestic Product has been on increase overtime until 2020 when a declination was experienced as a result of COVID-19 pandemic.

The trend of ER and the contribution of aviation industry to Nigeria GDP have been on increase over period simultaneously, hence, the linear trend line shows a steady increase in the pattern of foreign ER and the contribution of aviation industry to Nigeria GDP over the sample period 2000 to 2020. In the same vein, the respective R-squared values of 0.714 and 0.824 explain a good fit of the line to the data. The regression analysis of the impact of Passengers' traffic on ER and Economic Growth is summarized as the variable of PT has a positive impact on ER and economic growth. Thus, value of coefficient 0.073 which indicates that a change of 10% in Passengers' traffic will lead to a change of 0.73% in the ER. With a T-statistic of 3.296 and probability of 0.004, it indicates a statistically significant effect on the dependent variable (i.e. ER). Also, the value of coefficient 0.058 indicates that a change of 10% in Passengers' traffic will lead to a change of 0.58% in the Aviation contribution to GDP. With a T-statistic of 6.119 and probability of 0.000, it indicates a statistically significant impact on the dependent variable (i.e. Aviation contribution to GDP).

The recommendations are as thus; government need to regulate goods that are imported into the country, especially luxury goods and other items that can otherwise be produced locally in order to avoid wastage of the foreign reserves which could have been directed towards importation of industrial goods to help create more jobs and boost economic growth. The government should also try to minimize the activities of the foreign exchange parallel market. Only the licensed money changers should be allowed to operate bureau-de change and their activities should be closely supervised by the Central Bank of Nigeria. Nigeria aviation industry which is characterized by airline operations in her respective airports seems to be largely dominated by foreign airliners on international flight routes. This has however increased the demand of foreign currency thereby putting pressure on foreign exchange activities. Hence, the need for Nigeria government to encourage national carriers' existence and functionality in order to minimize this circumstantial occurrence as this will also in-turn create more jobs.

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