Sectorial Analysis of the Impact of Aviation Transport on Nigerian Economy: A Study of Four Selected International Airports (2003-2015)

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Abstract

This study examined the impact of aviation sector on economic growth in Nigeria using four selected international airports activities namely; Murtala Muhammed International Airport, Ikeja, Lagos; Mallam Aminu Kano International Airport, Kano; Nnamdi Azikiwe International Airport, Abuja; and Port Harcourt International Airport, Port Harcourt between 2003-2015. The study employed error correction model in analyzing the model specified in the study. The result revealed positive connection amid the explained variable LGDP and explanatory variables; Passanger Traffic and Aircraft Movement for all the considered airports which are all in compliance with the apriori expectation. All the explanatory variables except passenger traffic and aircraft movement of Mallam Aminu Kano International Airport were significant in explaining economic growth in Nigeria. While the error correction term, ECM_{t-1} with a high feedback of 84% has the expected negative sign and presented the rate at which disequilibrium will be adjusted back to equilibrium which also showed the existence of a strong relationship between the aviation sectors' activities and economic growth in Nigeria. The study recommends that government should ensure continuous supervision of the activities of aviation sector so as to increase their services of connecting people, goods and services which in turn will create more economic value leading to economic growth and improve aviation infrastructures for a competitive advantage to that of other countries.

Keywords

aviation, economic growth, Error Correction Model (ECM)

1. Introduction

The objective of economic growth and development which is the priority of every government in developed and emerging countries is mainly a function of her economic activities and management.

Transportation is an essential part of this processes and its broad expectation has gone beyond basic purpose of conveying goods and people from various point to another. It affords business and household right of entry between longitudinal estranged places involving product (freight) and individual movements. It is saddled with the responsibility of linking businesses and their input sources, as well as their markets. While, it aids household activities in terms of linking them to offices, schools, workshops as well as enabling them to use social, recreational, community and medical facilities (Hummels, 2007).

A noble transportation system swells economic doings by enhancing ease of access and accelerates movement of goods which includes agricultural produce all over the country. Oni and Okanlawon (2006) opined that, transport is the foundation of development and its importance grows with the complexity of the society as well as the economic activities. While, Amba et al. (2013) maintained that, the demand for any means of transportation swell with the leeway of the input-output relationships in an economy based on the fact that, such demand is a function of the demand for the commodities to which it will be used in conveying or the satisfaction to be derived by the passenger which is inimitable in time and space.

The antiquity of the recent transport system in Nigeria can be traced to the pre-colonial era. Although, prior to this period, the transport system was traced to a bush path method which was advanced into motorable routes in the first decade and the emergence of industrial revolution or development that led to advancement of other modes of transportation. Therefore, according to Anyanwu et al. (1997), road, railways, airways (aviation), inland waterways, coastal waters, the deep sea, and the pipeline are currently the means of transportation being operated in Nigeria. However, amongst these, the role of airways (aviation) in this era of globalization cannot be overemphasized. Its influence on economic activity varies from other systems for the reason of its unique characteristics which include; quickness, cost, suppleness, dependability, and safety. It is the most realistic far distance means of transportation for high-value unpreserved produces and people that takes timeliness into consideration as well as a unique way of accessing geographically isolated areas (Ishutkina & Hansman, 2008).

Operation of air transport in Nigeria begun in the period of World War II (1939-1945) and was as a result of the need to transport troops and supply food across the country. This led to the building of quite a lot of air strips which were latter converted after the war for use by the civilian (Ileoje, 2003). After which the cooperation between Nigerian government, Elder Dempster Lines and the British Overseas Airways Corporation (BOAC) in October, 1958 gave birth to Nigeria Airways, while domestic flights services were rendered by West African Airways Corporation (WAAC) (Filani, 1983).

Nigerian government in 1963 after acquiring the stake of other shareholders turn out to be the single owner of Nigeria Airways and the line solely provide domestic air services in Nigeria as well as engaged in global services end to end the West African Coast, Europe and the United States of America. The Airways therefore grew and ran a fleet of nineteen aircrafts for international flights as well as domestic routes in 1976 (Filani, 1983). At this period, additional main international airlines also

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operated air transport services to and fro of the World's major socio-economic and political centers. While, lots of charter companies also control other airlift in minor aircraft linking Lagos to the core trade and industry centers.

Hence, understanding the role played by air transportation system in the country's economy prompted the development of the country's air transportation system with an Airport development programme (1975-1980) which gave birth to the development of Murtala Mohammed Airport (Filani, 1983). In the same vein, six more airports in Kaduna, Port Harcourt, Kano, Ilorin, Sokoto and Maiduguri were established to house the biggest intercontinental aircraft. Aside from these airports development programme, there was massive manpower development in the aviation industry by the Federal Government which led to the establishment of the Nigerian Civil Aviation Training Centres saddled with the responsibility of training air personnel in areas such as air traffic controllers, communications personnel, maintenance engineers, piloting, and aeronautics teleprompter operators.

A new government owned airline emerged through a collaboration of Nigerian private financiers and the UK-based Virgin Atlantic Airways having the assistance of the Nigerian government know as Virgin Atlantic Airways (Wikipedia, 2011). This was aimed at liberalizing the civil aviation industry and this airline on the 17th September, 2009, was re-named as Nigeria Eagle Airlines which on 2nd June, 2010 was also transformed to Air Nigeria Development Limited, branded as Air Nigeria.

The need to understand the economic impact of aviation on the economy led the International Air Transport Association (IATA) to appraisal the economic and social doles of aviation in over 80 countries worldwide. This study with respect to Nigeria found that, Air transport makes three different types of economic benefits such as improving the gross domestic product, creating job chances and generating tax revenues (Oxford Economics, 2012). However, despite the enormous contributions of aviation sector, the economic worth created by the industry is greater than what was captured in the study (Saheed et al., 2015). Therefore, there is need for further and continuous evalution of the impact of aviation sector on Nigerian economy. Hence, this study seeks to assess the impact of aviation transport on the economy of Nigeria using four selected international airports in Nigeria between 2003 and 2015. To this end, this paper is divided into four sections, following this introduction is section two is the methodology, while section three discusses the results and interpretation. Finally, section four is the conclusion and recommendations from the study.

There are plethora of studies on the connection between air transport and economic growth in the literature with respect to developed and developing countries. However, results from these studies varies owing to different data, methodology, periods of analysis as well as peculiarities of each country. Goetz (1992) examined the impact of air transportation on the growth of 50 big USA metropolies economy. He collected data on employment, changes in population and air passenger flow volume per person and was analyzed using ordinary least square techniques. It was found that, effective air transportation system leads to airport planning which in turn raises the need for airport structures and thereby championing economic growth and development. Also, Fernandes and Pacheco (2010) studied

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the association between economic growth and domestic airline passenger transport in Brazil adopting Granger causality test from 1966-2006. The indicator of growth used was Gross domestic product, while its behaviour with respect to airline activities was explained by total domestic passenger-km values. The empirical investigation showed that, there is uni-directional relationship between domestic airline activities and economic growth with economic growth granger causing development in domestic airline. In addition, the authors also did similar study in 2010 which examined the association between air transport and economic growth within the period of 1990-2009. While GDP still remain the economic growth indicator, total profit of air transport was used as air transport development indicator. It was revealed from the findings that, development in the aviation sector is usually propelled by increased economic growth, while aviation sector development in turn significantly impact on economic growth.

Contrary to this, Nwaogbe et al. (2013), investigated the influence of air transport on economic expansion in Nigeria using descriptive analysis. It was revealed that, aviation sector increases gross domestic product and also generates employment opportunities to the Nigerian youth through direct, indirect, induced and catalytic route.

Not far different from the above is the work of Dharmawan (2012) who investigated the link between airline traffic incidence and economic growth in Indonesia using time series data for the period of 2000-2010. From the results, tourism contribution significantly affects airline usage and a unit increase in airline transport will increase economic growth to the tune on the airline increase. However, Mukkala and Tervo (2013) looked at variables' structure in line with various provinces so as to lay down the reality of the causality between the variables using data of 13 countries and 86 regions for the period of 1991-2010. The result from the analysis shows the existence of stout association between airline traffic and economic growth which was identified to be flowing from regional economic growth leads to upsurge in the number of people who favour air transportation. It was therefore concluded that, airline transport has play a significant role in the development of far-flung areas.

Also, Nwaogbe et al. (2013) studied the effect of the air transport sector on economic growth in Nigeria using time series data which was analyzed with ordinary least square regression technique. The finding from the result revealed that, air transport sector enormously contribute to the economic growth in Nigeria as well as the whole world through taxes levied on Gross Value Added which represent the sum of profits and wages, as well as via its lump sum investment. Also, Stephens et al. (2014) investigated the input of aviation sector to economic growth in Nigeria. The result from the study revealed that the national air transport industry is wild on the rise in term of the demand for its service. It also has a great impact on economic activities in the country thereby contributing to economic growth of the country.

Ugboaja (2013) in a study on the sustainability assessment of Nigerian transport policy. Using survey research method, the result of the investigation showed the total mean score of 2.22 which is lesser than the probable value of 3.00 as obtainable from a five point Likert scale. It was therefore concluded that transportation policy aids development in social sustainability which help in decreasing the adverse

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social effect originating from Nigeria's Transport system. In a similar development, Oyesiku et al. (2013) conducted a research on the influence of public sector venture in transport sector on economic growth using OLS regression technique for the period of 1977 to 2009. The estimated result showed that transportation impacted negatively on economic growth in Nigeria.

Isaac (2013) examined how airport infrastructure impact on socio-economic development in Nigeria. The result revealed positive impact of airport infrastructure on socio-economic development in the country and it was concluded that, government should increase its involvement, established directive and incorrupt procedure in granting contract as well as drawing verdict on issues relating to the development of aviation for veritable achievements in the aviation sector. In the same vein, Akanbi et al. (2013) also looked at how transportation infrastructure improvement has impacted on economic growth in Nigeria by employing ordinary least square regression techniques. Findings from the study revealed that, transport output and investment made on transport infrastructure in Nigeria have positive and significant impact on growth.

According to Oluwakoya and Olufemi (2013), the outcome of the deregulation and liberalization policy has increased airline services at the air terminals in Nigeria. The results revealed that reforms in aviation sector, have expanded service delivery of the air line operators in Nigeria. Ikpechukwu and Urael (2012) evaluated the effect of quality transport infrastructure on economic growth, they discovered a positive correlation between quality of transport and economic growth in Nigeria. Ladan (2012), opined that Nigeria air transport is bedeviled by confused transport policy, depraved administration, moldering amenities, unfastened security, shutting down of airport, sporadic air crashes amongst other factors.

Hence, with the above reviewed literatures, apart from the fact that most of the studies are not a recent study of the impact of aviation transport on economic growth, most of these works used descriptive analysis, granger causality as well as ordinary least square regression techniques with either primary data or time series data on the summation of airport variables without considering individual performance of the airports. This study improved on previous ones by considering the activities of the international airports as well as individual contribution of some of these airports in Nigeria using monthly time series data.

2. Method

2.1 Model Specification

The model formulated for this study is adapted from the model used by Siyan et al. (2015) which is rooted in the theoretical framework postulated by Bloch and Tang (2003).

Siyan et al. (2015) examined the effect of road transportation infrastructure on economic growth in Nigeria and established a functional relationship between road transportation infrastructure and economic growth using Gross Domestic Product (GDP) as a measure of economic growth, while Capital Utilization (CUR), Government Expenditure on Road Transportation (GENOT) and Exchange

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Rate (EXCHR) were the explanatory variables used to captured road transportation infrastructure. Therefore, the model is modified to suit our study and the functional form between the aviation transport activities and economic growth is presented as;

$$GDP = f(PASSTRF \text{ and } AIRMOV) \tag{1}$$

Where,

GDP is Gross domestic product, PASSTRF is Passenger Traffic, AIRMOV is Aircraft Movement

Equation 1 represents the general model for this study, while taking into consideration the uniqueness of this study, we recognized the activities of the four selected international airports (Murtala Muhammed International Airport, Lagos (MMA); Nnamdi Azikwe International Airport, Abuja (ABJ); Mallam Aminu Kano International Airport, Kano (KANO); and Port Harcourt International Airport (PHC)) and represent equation 1 as thus;

$$GDP = f(PASSTRF_{MMA}, PASSTRF_{ABJ},$$
$$PASSTRF_{KANO}, PASSTRF_{PHC}, AIRMOV_{MMA}, AIRMOV_{ABJ}, AIRMOV_{KANO} \text{ \& } AIRMOV_{PHC}) \tag{2}$$

Equation 2 can be rewritten and equally transformed by introducing the Logarithm form as thus.

$$logGDP =$$
$$\beta_0 + \beta_1 logPASSTRF_{MMA} + \beta_2 logPASSTRF_{ABJ} + \beta_3 logPASSTRF_{KANO} + \beta_4 logPASSTRF_{PHC} +$$
$$\beta_5 logAIRMOV_{MMA} + \beta_6 logAIRMOV_{ABJ} + \beta_7 logAIRMOV_{KANO} + \beta_8 logAIRMOV_{PHC} + \mu \tag{3}$$

Where μ is the error term and log is the logarithm form of the variables.

2.2 Data & Methodology

Empirical analysis in this study involves three stages. The first phase is to investigate the stationarity of the data in other to avoid spurious regression as a result of their linear combinations. Augumented Dickey Fuller (ADF) and Phillips and Perron tests stationarity test were used, while the long run relationship among the variables was examined using Johansen and Juselius (1990) cointegration test. The last stage is the estimation of the model using Error Correction Model approach based on the result of the stationarity and co-integration tests.

3. Result and Discussion

3.1 Unit Root Test Result

The result of the stationarity test conducted on each of the variables explained in the model using ADF and PP techniques is presented in Table 1.

Table 1. Unit Root Test Result

VARIABLES	ADF TEST	PP TEST	Order of Integration
	H_0: Variable is not Stationary	H_0: Variable is not Stationary	
LGDP	-0.304050	-0.312783	
Δ(LGDP)	-3.762392*	-3.709103**	I(1)
LPT_MMA	-1.725846	-1.891261	
Δ(LPT_MMA)	-5.025508*	-5.025508*	I(1)
LPT_ABJ	-0.709690	-2.160433	
Δ(LPT_ABJ)	-3.764525*	-5.587874*	I(1)
LPT_KANO	-0.286474	-0.304405	
Δ(LPT_KANO)	-3.273673*	-3.734354*	I(1)
LPT_PHC	-1.642746	-1.694763	
Δ(LPT_PHC)	-4.783772*	-4.926746*	I(1)
LAM_MMA	-0.693673	-0.735635	
Δ(LAM_MMA)	-4.825745*	-4.973573*	I(1)
LAM_ABJ	-0.724635	-0.863467	
Δ(LAM_ABJ)	-3.964764*	-3.963753*	I(1)
LAM_KANO	-1.374894	-1.40036	
Δ(LAM_KANO)	-5.374573*	-5.408367*	I(1)
LAM_PHC	-0.374377	-0.386735	
Δ(LAM_PHC)	-5.963763*	-6.003752*	I(1)
Asymptotic Critical Values			
1%	-3.724070	-3.724070	
5%	-2.986225	-2.986225	
10%	-2.632604	-2.632604	

* implies significant at 1% level, ** implies significant at 5% level, and * implies significant at 10% level. Δ represents first difference.

Source: Authors' computation from E-view 9.5, 2017.

Table 1 revealed that, the variables are stationary at level given the asymptotic critical values that were less than the calculated values of ADF and PP. Therefore, after the variables were transformed to their first difference, they all became stationary at an integration of order one, I(1).

3.2 Lag Length Selection Test

The Schwarz Information Criterion (SIC) was used in selecting the optimal lag length as guided by the information given in the test conducted. The result presented in Table 2 revealed that one lag length is appropriate for the analysis as supported by all the information criterion used.

Table 2. VAR Lag Order Selection Criteria

Endogenous variables: LGDP LAM_ABJ LAM_KANO LAM_MMA LAM_PHC LPT_ABJ LPT_KANO LPT_MMA LPT_PHC

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-11846.51	NA	9.79e+62	170.5828	170.7728	170.6600
1	-11209.16	1182.991*	3.28e+59*	162.5778*	164.4778*	163.3499*
2	-11156.53	90.86337	4.99e+59	162.9861	166.5961	164.4531
3	-11101.38	88.08542	7.50e+59	163.3580	168.6780	165.5199
4	-11035.83	96.20700	1.00e+60	163.5803	170.6103	166.4371
5	-10978.17	77.15244	1.57e+60	163.9161	172.6562	167.4679
6	-10927.19	61.62172	2.90e+60	164.3480	174.7981	168.5946
7	-10847.27	86.24357	3.82e+60	164.3636	176.5237	169.3051
8	-10753.19	89.33470	4.61e+60	164.1755	178.0456	169.8119

* indicates lag order selected by the criterion.

Source: Authors' computation from E-view 9.5, 2017.

3.3 Johansen and Juselius Cointegration Test

Table 3. Johansen and Juselius Cointegration Test

Series: LGDP LAM_ABJ LAM_KANO LAM_MMA LAM_PHC LPT_ABJ LPT_KANO LPT_MMA LPT_PHC

Trace Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.389716	254.2869	197.3709	0.0000
At most 1 *	0.303153	180.7061	159.5297	0.0021
At most 2 *	0.246622	126.8889	125.6154	0.0417
At most 3	0.202465	84.69394	95.75366	0.2256
At most 4	0.147338	50.98581	69.81889	0.5945
At most 5	0.085139	27.23631	47.85613	0.8452
At most 6	0.056253	13.97790	29.79707	0.8419
At most 7	0.030418	5.351208	15.49471	0.7704
At most 8	0.005012	0.748600	3.841466	0.3869

Trace test shows 3 cointegrating eqn(s) at the 0.05 level

Maximum Eigenvalue Test

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.389716	73.58080	58.43354	0.0009
At most 1 *	0.303153	53.81722	52.36261	0.0352
At most 2	0.246622	42.19494	46.23142	0.1272

At most 3	0.202465	33.70813	40.07757	0.2186
At most 4	0.147338	23.74950	33.87687	0.4740
At most 5	0.085139	13.25841	27.58434	0.8702
At most 6	0.056253	8.626692	21.13162	0.8613
At most 7	0.030418	4.602608	14.26460	0.7909
At most 8	0.005012	0.748600	3.841466	0.3869
Max-eigenvalue test shows 2 cointegrating eqn(s) at the 0.05 level				

* denotes rejection of the hypothesis at the 0.05 level; ** MacKinnon-Haug-Michelis (1999) p-values.

Source: Authors' computation from E-view 9.5, 2017.

Table 3 revealed that, there is cointegration among the variables with trace statistic test reporting three cointegrating equations at 5% level of significant and Max-Eigen statistic reporting two cointegrating equations. The implication of this is that, there exist at most one long run relationships among the variables. Hence, we proceed using error correction model for our estimation.

3.4 Estimation of the Error Correction Model

Table 4. Results of Error Correction Model

Dependent Variable: LGDP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10314.57	2036.356	5.065207	0.0000
LPT_MMA	0.083552	0.011298	7.395633	0.0000
LPT_ABJ	2.824357	1.040231	2.715124	0.0074
LPT_KANO	0.023056	0.051656	0.446331	0.6560
LPT_PHC	6.352744	0.787828	8.063614	0.0000
LAM_MM	0.188333	0.037736	4.990839	0.0000
LAM_ABJ	4.529840	1.311307	3.454447	0.0002
LAM_KANO	0.008051	0.042402	0.189883	0.8497
LAM_PHC	10.25211	1.046281	9.798623	0.0000
ECM(-1)	0.842822	0.050824	16.58304	0.0000
R-squared	0.818473	Mean dependent var		28310.78
Adjusted R-squared	0.807048	S.D. dependent var		10886.84
S.E. of regression	4782.185	Akaike info criterion		19.84631
Sum squared resid	3.27E+09	Schwarz criterion		20.04438
Log likelihood	-1508.243	Hannan-Quinn criter.		19.92677
F-statistic	71.64009	Durbin-Watson stat		1.845125
Prob(F-statistic)	0.000000			

* and ** denote significance at 1% and 5% level respectively.

Source: Authors' computation from E-view 9.5, 2017.

The error correction model estimated result presented in Table 4 revealed the existence of a positive and significant relationship between the dependent variable LGDP and independent variables which are all in compliance with the apriori expectation. Specifically, one percent increase in passenger traffic at MMA, MAKA, NAA, and PA will lead to 0.08, 0.023, 2.824 and 6.352 increase in economic growth in Nigeria respectively. While, one percentage increase in aircraft movement of MMA, MAKA, NAA, and PA will lead to 0.19, 0.01, 4.53 and 10.25 increase in economic growth in Nigeria respectively. All the explanatory variables except passanger traffic and aircraft movement of Mallam Aminu Kano International Airport were significant given their probability value in explaining economic growth in Nigeria.

The Durbin Watson statistics of 1.85 indicates the nonexistence of autocorrelation. Consequently, we cast-off the null hypothesis of the existence of autocorrelation amongst the error terms in the model and admit the alternative hypothesis of no autocorrelation between the white noise terms.

The suitability of the model is established by the F-statistic which is significant at 5 percent given the probability value of 0.000000 which led to rejection of null hypothesis put forward that, the independent variables in the model does not in cooperation explain significant variations in economic growth in Nigeria and concluded that they are simultaneously significant.

The error correction term, ECM_{t-1}, also was significant at 5% with a high response of 84%. At the same time, it has negative sign as expected which is an indication that the modification is in the right course to reinstate the long run relationship. This also ratifies the existence of a strong relationship among the aviation sectors' activities and economic growth in Nigeria.

Diagnostic Test

Table 5. Summary of Diagnostic Tests for the ECM Model

TEST	GDP
Jarque-Bera Normality	4.0345
	(0.172)
Breusch-Godfrey (B-G)	1.3773
	(0.318)
Heteroskedasticity	0.1902
	(0.980)
Ramsey Reset	0.1124
	(0.782)

Note. The probability is given in parenthesis while the F-statistics are above the probability value.

Source: Authors' computation from E-view 9.5, 2017.

The result of the diagnostic tests revealed that the residuals in the model are normally distributed as

Jarque-Bera normality test showed favourable result. There is also a normal process of error between aviation sector activities and economic growth, while the Breusch-Godfrey test possess a sturdier statistical control signifying the absence of serial correlation. The result also showed no traces of heteroskedasticity problem and specification error. Therefore, we conclude that the model was well specified and the results are credible.

4. Conclusion

This study examined the impact of aviation sector on economic growth in Nigeria using a sectorial analysis approach for the period of 2003 to 2015. The study considered the activities of four international airports namely; Murtala Muhammed International Airport, Ikeja, Lagos; Mallam Aminu Kano International Airport, Kano; Nnamdi Azikiwe International Airport, Abuja; and Port Harcourt International Airport, Port Harcourt. After testing the time series properties as well as long run relationship among the variables used in the model, the study employed error correction model in analyzing the model specified in the study.

The result of the error correction model revealed positive relationship between the dependent variable LGDP and independent variables which are all in compliance with the apriori expectation. All the explanatory variables except passenger traffic and aircraft movement of Mallam Aminu Kano International Airport were significant given their probability value in explaining economic growth in Nigeria. While the error correction term, ECM_{t-1} with a high feedback of 84% and negatively signed showed that the adjustment is in the right direction to restore the long run relationship which also confirms the existence of a strong relationship among the aviation sectors' activities and economic growth in Nigeria. It is therefore important that government should ensure continuous supervision of the activities of aviation sector so as to increase their services of connecting people, goods and services which in turn will create more economic value leading to economic growth and improve aviation infrastructures for a competitive advantage to that of other countries.

References

Adeniji, K. (1993). *Transport policy and subsidy: An overview*. Ibadan, NISER.

Adeniyi. (1987). *Transport Planning and development in Nigeria, Policy and challenge*. Ibadan: NISER.

Aizerman, J. (2004). Endogenous Pricing to Market and Financing Cost. *Journal of Monetary Economics*, *51*(4), 691-712. https://doi.org/10.1016/j.jmoneco.2003.08.013

Akanbi, B., Bamidele, A., & Dunni, A. (2013). Transport Infrastructure Improvement and Economic Growth in Nigeria. *International Journal of Humanities and Social Science Invention*, *2*(8), 26-31.

Amba, D. A., & Danladi, J. D. (2013). An appraisal of the Nigerian transport sector: Evidence from the railway and aviation sub-sectors. *Journal of economics and sustainable development*, *4*(10), 161-170.

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Anyanwu, J. C., Oaikhena, H., Oyefusi, A., & Dimowo, F. A. (1997). *The Structure of the Nigerian Economy (1960-1977)*. Onitsha, Nigeria: Joanne Educational Publishers Ltd.

Bloch, H., & Tang, S. H. K. (2003). The role of financial development in economic growth. *Progress in Development Studies*, *3*(3), 243-251. https://doi.org/10.1191/1464993403ps063pr

Daramola, A. Y. (2003). Innovative Options for Financing Transport Infrastructure in Nigeria. *The Magazine of the Nigerian Institute of Social and Economic Research*, *4 & 5*.

Dharmawan, I. G. N. I. (2012). *The Effect of Air Transport to Economic Development in Indonesia, Erasmus University*.

Engle, & Granger. (1987). Cointegration and Error Correction: Representation, Estimation and Testing. *Econometrica*, *55*, 251-276. https://doi.org/10.2307/1913236

Fernandes, E., & Pacheco, R. R. (2010). The causal relationship between GDP and domestic air passenger traffic in Brazil. *Transportation Planning and Technology*, *33*(7), 569-581. https://doi.org/10.1080/03081060.2010.512217

Filani, M. (2003). *Advancing the Cause of Private Participation in the Road Transport Sub-sector in Nigeria*. A paper delivered at the 10PthP anniversary celebration of the Associated Bus Company (ABC) Ltd.

Florida, R., Mellander, C., & Holgersson, T. (2012). *Up in the air: The role of airports for regional economic development, Royal Institute of Technology, CESIS-Centre of Excellence for Science and Innovation Studies*.

Goetz, A. R. (1992). Air Passenger Transportation and Growth in the US Urban System, 1950-1987. *Growth and Change*, *23*, 218-242. https://doi.org/10.1111/j.1468-2257.1992.tb00580.x

Hummels, D. (2007). Transportation costs and international trade in the second era of globalization. *Journal of Economic Perspectives*, *21*(3), 131-154. https://doi.org/10.1257/jep.21.3.131

Ikpechukwu, N., & Urael, U. (2012). The impact of the quality of transport infrastructure on the Nigerian economy. *Journal of economic and sustainable development*, *3*(10), 174-180.

Ileoje, N. P. (2003). *A New Geography of Nigeria* (5th ed.). Ikeja, Lagos: Longman Nigeria Plc.

Isaac, I. A. (2013). Airport development and socio-economic development of Nigeria. *Journal of research in national development*, *11*(1), 196-205.

Ishutkina, M., & Hansman, R. J. (2008). Analysis of Interaction between Air Transportation and Economic Activity. In *The 26th Congress of ICAS and 8th AIAA ATIO* (p. 8888). https://doi.org/10.2514/6.2008-8888

Jensen-Butler, C., & Madsen, B. (2005) Transport and regional growth. In K. J. Button, & D. A. Hensher (Eds.), *Handbook of Transport Strategy, Policy and Institutions* (pp. 191-223). Elsevier. https://doi.org/10.1108/9780080456041-012

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration-with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, *52*(2), 169-210. https://doi.org/10.1111/j.1468-0084.1990.mp52002003.x

Ladan, S. I. (2012). An analysis of air transportation in Nigeria. *Journal of research in national development*, *10*(2).

Mukkala, K., & Tervo, H. (2013). Air transportation and regional growth: Which way does the causality run? *Environment and Planning A*, *45*(6), 1508-1520. https://doi.org/10.1068/a45298

Nwaogbe, O., Wokili, R., & Victor, O. (2013). An Analysis of the Impact of Air Transport Sector to Economic Development in Nigeria. *Journal of Business and Management*, *14*(5), 41-48.

Oluwakoya, A., & Olufemi C. (2012). Airline services in Nigeria. *International business management*, *5*(4), 218-222.

Oni, S. I., & Okanlawon, K. (2006). Nigeria's transport infrastructural development: An integral part of the national economic empowerment and development strategy (NEEDS). *Journal of Social and Policy Issues*, *3*(2), 7-13.

Oxford Economics. (2012). *Economic Benefits from Air Transport in Nigeria*. Nigeria country report.

Oyesiku, K. O., Adegbemi, B., & Folawewo, A. (2013). An empirical analysis of transport infrastructure, investment and economic growth in Nigeria. *Social science*, *2*(6), 179-188.

Saheed, A. A. A., & Iluno, S. Z. C. (2015). Air Transportation Development and Economic Growth in Nigeria. *Journal of Economics and Sustainable Development*, *6*(2).

Siyan, P., Eremionkhale, R., & Makwe, E. (2015). The Impact of Road Transportation Infrastructure on Economic Growth in Nigeria. *International Journal of Management and Commerce Innovations*, *3*(1), 673-680.

Stephens, M. S., Ikeogu, V., & Upkere, W. I. (2014). Empirical Analysis of the Contribution of the Aviation Industry to the Nigeria Economy. *Mediterrenean Journal of Social Science*, *5*(3). https://doi.org/10.5901/mjss.2014.v5n3p115

Ugboaja, P. C. A. (2013). Sustainability assessment of Nigerian transport policy. *International Journal of Asian social science*, *3*(5), 1208-1226.

Wikipedia. (2011). *Air Nigeria*. Retrieved March 2, 2017, from http://www.en.wikipedia.org/wiki/air-Nigeria-development