

Comparative Analysis in Variability of Aircraft-Passenger Movement in Nigeria Airports

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Introduction

The history of aviation industry in Nigeria is dated back to 1920s and the earliest commercial aviation is credited to Mr. Bud Carpenter, who frequently undertook high-risk flight between Kano and Lagos, using the rail tracks as his guide (Deba et al., 2005). An enterprising pilot carried a few fare-paying passengers in a sea-plane between Lagos and Warri in 1930. By 1935, the Imperial Airways later know as the British Overseas Airways Corporation (BOAC), commenced operations with flights from London to Nigeria. As a result of development in the aviation industry, there is need for more aerodromes necessary to handle the aviation enterprises. By the end of 1940, Lagos had been converted into a strategic base from where aircrafts were being ferried to Middle East and India as part of the war effort. In 1946, the king of England issued an edict establishing the West African Air Transport Authority (WAATA) as well as the formation of the West Airways Corporation (WAAC). In the year 1957, Ghana withdrew from the company after her independence and Nigeria government in collaboration with BOAC and Elder Dempster lines formed the West African Airways Corporation (Nigeria) Limited which was later renamed Nigeria Airways.

The Nigeria Aviation Industry is divided into three namely; Nigerian Airspace Management Agency (NAMA), Nigerian Civil Aviation Authority (NCAA) and Federal Airport Authority of Nigeria (FAAN). The development of air transport (Aviation) started in Nigeria at the end of the Second World War in 1946 with the defunct West African Airway Corporation (WAAC) with headquarters sited in Lagos (Filani, 1975). The corporation operated between Nigeria, Gold coast (Ghana), Sierra Leone and the Gambia using Dove Aircraft. Nigeria Civil Aviation Administration was established as a result of increase in the frequent use of air transport under Squadron H.C Brilliant (a Briton) who was replaced in 1956 by another Briton in person of Wing Commander E.H Coleman.

In 1964, Mr. V.A Roberts (a Nigerian) was appointed as a Deputy Director of Civil Aviation. The Nigerian government gave more attention to air transport development in the 1970s mainly for political and social consideration rather than economy. During this period, Sixteen (16) Airports were developed and expanded. Four(4) of them simultaneously in Lagos, Ibadan, Benin, Enugu, Kaduna, Jos, Calabar, port Harcourt, Abuja, Ilorin, Makurdi, Sokoto, Maiduguri and Kano. Lagos, Kano, and Port Harcourt have been developed to international standard. The runways aprons and terminal buildings have been completed. Presently, Lagos airport alone handles about 80% of the domestic and international passengers, which makes it to be recognized as the most viable and functional airport in the country.

As at 2011, there were eight (8) international airports and twenty (20) domestic airports in Nigeria in addition to other landing stations for private organization and the Nigeria military. Despite the fact that air transport is the fastest and most convenient means of transport system in developing nation of Africa, it is the least patronized due to financial constraint and economy situation of most African countries. The widely used internal transportation is via land with low patronage of internal land air traffic. However, the affluence people can afford the cost purposely because of their time schedule, distance and space, financial status and public recognition. Movement of both passengers and aircraft vary with respect to economy situation of the concerned countries (origin and destination) and season.

Over the years, the festive periods especially during the month of Islamic pilgrimage (Hajj) period and month of December have been noticed to be the season with the highest rate of passengers' movement in and out of the country. Vulnerability of flight to climatic anomalies of the involved Nations also regulates the scheduled plan of the flight movements especially during the harmattan and rainy season.

Objectives of the Study

The main aim of this study is to analyze the variability of passengers and aircrafts movement pattern across the airports in Nigeria. This study will particularly: analyze the trend pattern in passengers and aircrafts movement over years, analyze the correlation analysis between the rate of passengers and aircrafts movement in both international and local airports in the country and examine the variation between domestic and international aircrafts and passengers over years.

Hypotheses

Ho: There is no significant variability in percentage rate of change in international and domestic movement across Nigeria airports.

Hi: There is significant variability in percentage rate of change in both domestic and international movement in Nigeria.

Study Area

Nigeria is located in the West Africa sub-region. It is bounded in the north by Niger Republic, south by Atlantic Ocean, east by Cameroon and Chad and west by Benin Republic. She is the most populous country in Africa. With respect to National population Commission (NPC,2006), Nigeria accounted for more than 140 million and by August, 2011 estimated to be about 167 million. Nigeria is located within the longitude 3⁰E and 15⁰E and latitude 4⁰N and 14⁰N of the equator. Presently, Nigeria has about eight (8) major International Airports and the most functional among them are: Murtala Muhammed Airport, Lagos, Nnamdi Azikwe International Airport, Abuja and Mallam Aminu Kano International Airport, Kano. MMA is the busiest international Airports in Nigeria that always account for more than 80% of the international airport service operation in Nigeria follow by MAKIA. Five of the International Airports were located in the northern part of the country while the rest were in the southern. Those in the north are mostly underutilized even during the month of Islamic pilgrimage.

Materials and Methods

Data used for the analysis were sourced from Nigerian Airspace Management Agency (NAMA) and Federal Airport Authority of Nigeria (FAAN). The data focused on information about passengers and aircrafts arrival and departure across the major International Airport in Nigeria. The data covers twelve years (2000 to 2011). The descriptive analysis of the data were presented in tables 1 and 2 while the graphical illustration of these data were subjected to Time Series Analysis to show annual pattern of both movements. Pearson Moment Product Correlation was applied to examine the relationship between the annual aircraft and passengers' movement over years.

Table 1: Annual Movement of Aircraft and Passengers in Domestic and International Airport in Nigeria

Year	Aircrafts (Domestic and International)				Passengers (Domestic and International)			
	Domestic	International	Variation(%)	Total	Domesti c	International	Variation (%)	Total
2000	101530	22540(22.20)	78990(77.80)	124070	3384262	1882124(55.69)	1502138(44.39)	5266386
2001	123684	21689(17.54)	101995(82.46)	145373	4399333	2151542(48.90)	2247791(51.09)	6550875
2002	120507	24566(20.39)	95941(79.61)	145073	4831525	2601330(53.84)	2230195(46.16)	7432855
2003	138699	22997(16.58)	115702(83.42)	161696	5573101	2334493(41.89)	3238608(58.11)	7907594
2004	168054	23185(13.79)	144869(86.21)	191239	6461551	2458557(38.04)	4002994(61.95)	8920108
2005	160198	26681(16.16)	133517(83.34)	186879	6839707	2744888(59.87)	4094819(40.13)	9584595
2006	196321	26795(13.65)	169526(86.35)	223116	7016780	2780256(39.62)	4236524(60.38)	9797036
2007	191805	27976(14.59)	163829(85.41)	219781	7174200	2984192(41.60)	4190008(58.40)	10158392
2008	216502	32166(14.86)	184336(85.14)	248668	8675937	3439629(39.65)	5235308(60.35)	12115566
2009	232459	33686(14.49)	198773(85.51)	266145	10030821	3182602(31.73)	6848219(68.27)	13213423
2010	230532	39181(16.99)	191351(83.01)	269713	1140165	3746236932.86)	7655415(66.13)	15147887
2011	244926	39758(16.23)	205168(83.77)	284684	11576181	4061508(35.08)	7514673(64.91)	15637689
A.V.T	(85.88%)	(14.12%)	(83.50%)	205536.42	(71.77%)	(28.23%)	(56.69%)	10144367.17

Source: Nigerian Airspace Management Agency, 2011

Table2: Percentage Variation in Passenger and Aircraft

Year	PV	AV	IPV	IAV	DPV	DAV
2000	44.39	77.80	55.61	22.20	64.26	81.82
2001	51.09	82.46	48.90	17.54	67.16	85.08
2002	46.16	79.61	53.84	20.39	65.00	83.07
2003	58.11	83.42	41.89	16.58	70.46	85.78
2004	61.95	86.21	38.04	13.79	72.44	87.88
2005	40.13	83.34	40.13	16.66	71.36	85.72
2006	60.38	86.35	39.62	13.65	71.62	87.99
2007	58.40	88.41	41.60	14.59	70.62	87.27
2008	60.35	85.14	39.65	14.86	71.61	87.06
2009	68.27	85.51	31.73	14.49	75.91	87.34
2010	66.31	83.01	32.86	16.99	75.27	85.47
2011	64.91	88.77	35.08	16.23	74.03	86.03
A.V.T	56.70	84.17	41.58	16.50	70.81	85.88

Source: Authors, 2011

PV: Passenger Variation

AV: Aircraft Variation,

IPV: International Passenger Variation

IAV: International aircraft Variation

DPV: Domestic Passenger Variation

DAV: Domestic Aircraft Variation

Correlation Coefficient

PV & AV: $r=0.688^*$, $r^2=0.4733$ @0.05

IPV & IAV: $r=0.780^{**}$ $r^2=0.6084$ @0.01

DPV&DAV: $r=0.749^{**}$ $r^2=0.5610$ @0.01

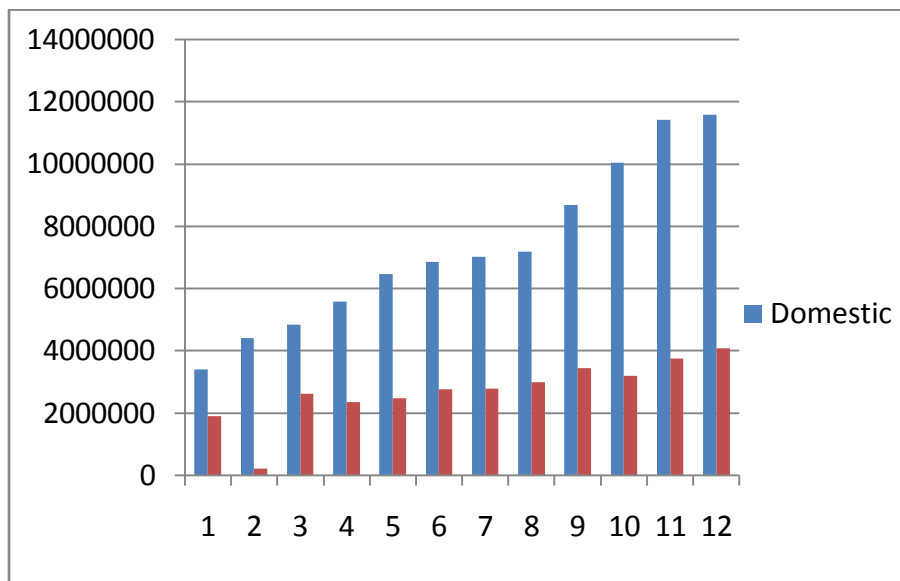


Figure 1: Passenger s’ movement in domestic and international airports (2000-2011)

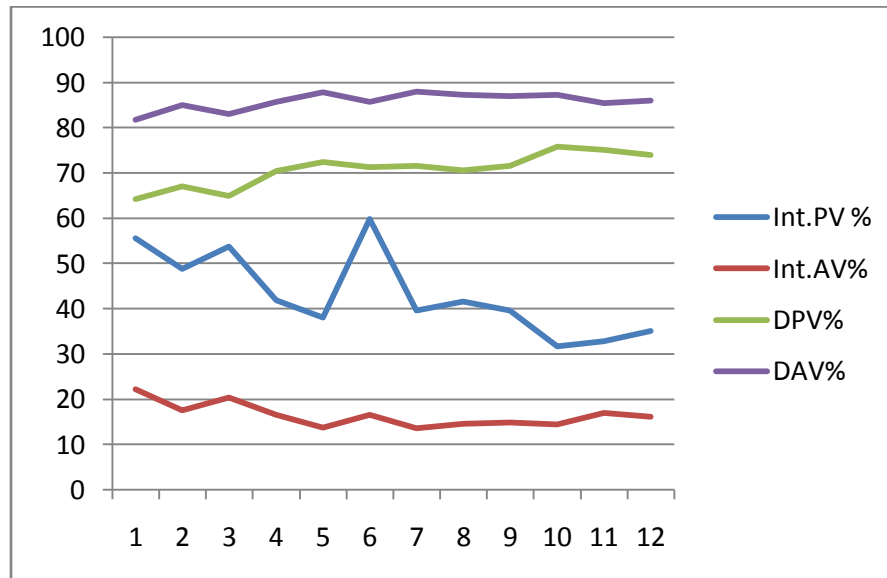


Figure 2: Passenger and Aircraft Variation in Domestic and International Airports in Nigeria (2000-2011)

Results and Discussion

The passenger and aircraft variations at domestic airport follow similar pattern of change with slight oscillation. The IPV was highest in the year 2000 (55.61%) and lowest in 2009 (31.73%) while IAV was highest was highest in 2000 (22.20%) but lowest in 2006 (13.65%). However, the DPV was highest in the year 2009 (75.91%) and lowest in 2000 (64.26%) while DAV was lowest in 2000 (81.82%) and highest in 2006 (87.99%). The correlation coefficients show that the rate of international passengers is directly proportional to the rate of aircrafts movement across the airports with correlation coefficient of 0.780** at 0.01 level of significant. The same situation applied to domestic passengers and aircraft variation with correlation coefficient of 0.749** at 0.01 level of significant (see table 2). Table 1 showed that the higher the international and domestic aircrafts movement, the higher the rate of passengers movement. The figures revealed that 85.88% of aircraft movement across the Nigeria airports account for domestic with 14.12% for international flights. Also, 71.77% of passengers’ movements were through domestic airports while 28.23% of movements were international.

Contributions to Knowledge

This research work exposed the critical aspect of aviation industry in Nigeria. The cost of maintenance and affordability of air transport in Nigeria is beyond the financial capability of the average Nigerian. Also, most of people in Nigeria find it difficult to distinguish between domestic and international airport and aircraft as well as financial unit of payment (USD). In addition, the liquidation of many airlines has been attributed to the management problem and maintenance incapability. This paper therefore **expatiates** domestic and foreign passengers and aircrafts movement within the period of twelve years of observation. It also analyzed the degree of relationship between aircrafts and passengers movement both at domestic and international level. The used line and bar graph clarified the rate of variation, oscillation and changes in relation to year between 2000 to 2011. The result of this paper can be utilized by Nigerian aviation industry and government to strategize the development of aviation industry and further research study in air transport industry. It can also help the Nigerian government to investigate the reasons behind under utilization of some domestic and international airports in Nigeria. It can also be used by federal government to estimate and predict the expected annual internal revenue (IGR) and allocation of fund (budget) to aviation industry that is ratio of IGR to aviation budget.

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