

Drivers of the Aviation Industry Growth in Africa

Study powered by AFRAA economics models

Although Africa represents 15% of the global population, in 2018 airlines present in African airspace operated only 5.5% of the world's commercial passenger and freight aircraft¹. In terms of aviation industry competitiveness over time, Africa continent is still not performing as per the average expectation, despite the recent notable general improvement. Air traffic growth in Africa has been on an upward trend since 2011 with the passenger services being the key contributor having grown at a rate of 4% in 2019² fueled by a conducive global economic environment.

In terms of profitability, majority of African airlines have been incurring losses as the majority of non-African airlines earn profits. However, the African aviation market has been hailed as one with high potential for growth owing to the continent's growing youthful population and the emerging industrial sector³. Against this background, it is necessary to determine the drivers of the aviation sector growth in Africa. This study identified three key indicators of performance in the sector as: growth in air passenger demand, air cargo transportation and revenue. With significant growth in passenger demand and volume of cargo transported, revenues in the sector grow. The determinants of air passenger demand, cargo transportation and airlines revenue are therefore critical in evaluating the drivers of growth in the industry.

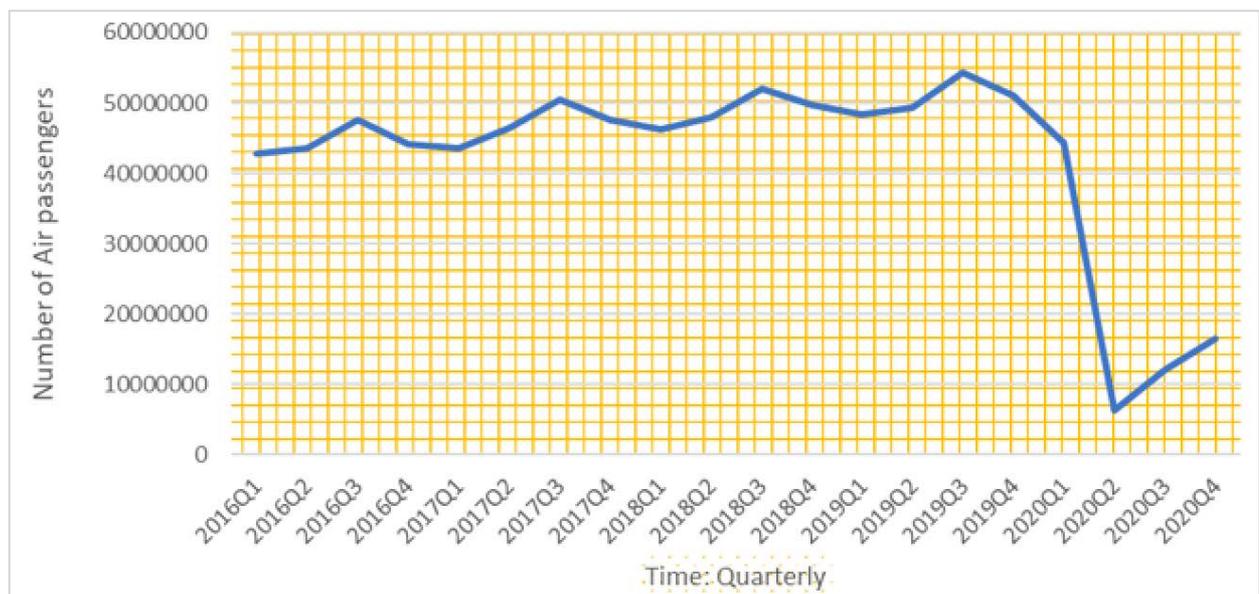
This study estimated the air passenger demand model, to establish factors that influence air travel demand. Due to lack of consistent data on cargo transportation along various routes and its associated factors, revenue model was estimated. Estimation of the models were based on Data for selected 106 busiest city pair spread across the five regions of Africa, over a five-year period (2016 to 2020). The 106 city pair routes in Africa (See Appendix: Table A1 and A2) comprised of 48 within regions and 58 across regions.

a) Air passenger demand in Africa

The two core functions of airlines (aviation) is to transport passengers and cargo. Growth in air passenger demand, all things constant leads to growth in aviation revenues and consequently growth in the industry. Figure 1 shows the trend of air passenger demand in Africa on a quarterly basis from 2016 to 2020.

In the estimated passenger demand model, the aggregate number of air passengers for each city-pair route in a year was assumed to be influenced by annual average fare, level of economic activity in the associated countries captured by gross domestic product (GDP), Distance, and population of the two countries.

Figure 1: The Trend of Air passenger demand in Africa, 2016 Quarter 1 to 2020 Quarter 4



¹<https://www.nortonrosefulbright.com/en/knowledge/publications/250cfc0e/africa---is-it-a-major-untapped-market-for-the-airline-industry>

²AFRAA Annual Report, 2020

³Aviation: Benefits Beyond Borders (ABBB), 2019, Air Transport Action Group (ATAG), https://aviationbenefits.org/media/166344/abbb19_full-report_web.pdf

Dummy variables were included to capture the impact of air liberalisation (period after the signing of the Single African Air Transport Market – SAATM and subsequent participation); regional operation (whether the route was within a region or interregional) as well as the impact of

corona pandemic. The sensitivity of passenger demand to the economic and demographic variables captured by the elasticity values provide critical information of the relative importance of each variable in driving its growth. The estimated elasticity values are shown in Table 1.

Table 1: Elasticity of Air passenger demand to economic and demographic variables

Variable	Elasticity	Comment
Average fare	-0.301	On average, 1% increase in average fare results to a 0.301% fall in demand for air transport
GDP	0.226	on average, 1% growth in GDP results to a 0.226% rise in demand for air transport
Distance	0.349	On average, 1% increase in distance results to a 0.349% rise in demand for air transport
Population	0.242	On average, 1% growth in population results to a 0.242% rise in demand for air transport
Liberalisation (dummy)	0.075	Presence of liberalisation results to significant rise in demand for air transport
Regional operation (dummy)	-1.62	Restriction of airline services within regions results to significant reduction in the number of air transport passengers
Corona pandemic (dummy)	-1.019	Presence of Corona pandemic significantly reduces the number of air transport passengers across Africa

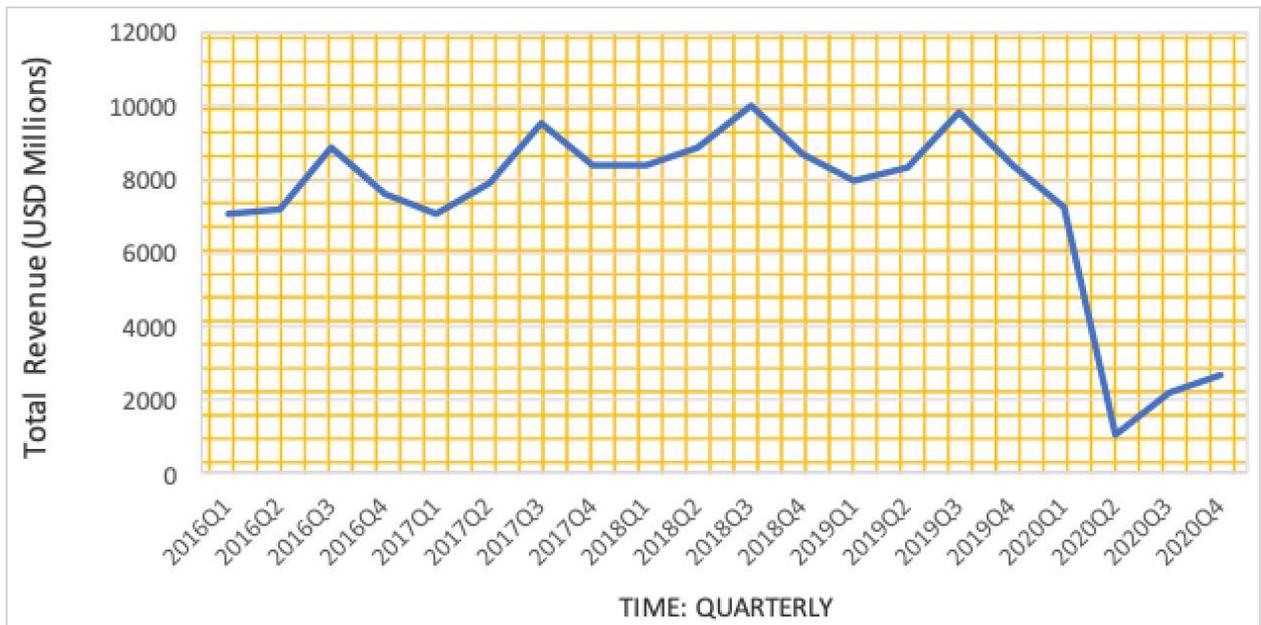
Note: Elasticity measures the percentage change in number of passengers a result of 1% increase in the respective variable

The model predicts with over 90 percent confidence that average fare, GDP, distance, liberalisation effort, the corona pandemic, and regional operations influenced air passenger demand in the study period. Population was established to influence demand but with a lower level of confidence of 87%.

b) Airlines revenue model for Africa

Airlines revenue captures the market value of total airlines services in a given period and therefore constitute the value of tickets sold. The aviation sector is assumed to grow with the growth in airlines revenue. Figure 2 shows the trend of airlines revenue in Africa on a quarterly basis from 2016 to 2020.

Figure 2: The Trend of airlines revenue in Africa, 2016 Quarter 1 to 2020 Quarter 4



The study estimated a model for the annual aggregate airlines revenue per city pair route as dependent on average fare, distance between the city pairs, trade volume, population, and dummies to capture regional operation, liberalisation, and Corona pandemic. Variables associated

with volumes of cargo transported were not available from the accessible data sources. The relative importance of each variable in explaining aviation revenue growth are given by the elasticity values obtained from the model and shown in Table 2.

Table 2: Elasticity of airlines revenue to economic and demographic variables

Variable	Elasticity	Comment
Average fare	-0.583	On average, 1% increase in average fare results to a 0.583% fall in airlines revenue in Africa
Trade volume	0.063	On average, 1% rise in trade volume results to a 0.063% increase in airlines revenue in Africa
Distance	0.364	On average, 1% increase in distance results to a 0.364% increase in airlines revenue in Africa
Population	0.0093	On average, 1% growth in population results to a 0.0093% increase in airlines revenue in Africa
Liberalisation dummy	0.063	Presence of liberalisation results to significant increase in airlines revenue in Africa
Regional operation (dummy)	-1.785	Restriction of airline services within regions results to significant reduction in the airlines revenue compared to those operating at cross-regional level in Africa
Corona pandemic (dummy)	-1.043	Presence of Corona pandemic significantly reduces the airlines revenue across Africa

Note: Elasticity represents percentage change in aviation revenue as a result of 1% increase in the respective variable.

The estimations predict with more than 90 percent confidence that airlines revenue in Africa is influenced by average fare, distance, corona pandemic and air liberalisation efforts. It also shows that revenues were significantly low during the pandemic. The impacts of increase in trade volume and population are consistent with theoretical predictions but the level of confidence in the estimates is low.

c) Drivers of aviation growth

From the Passenger Demand and Airlines Revenue models, we conclude that growth in the aviation sector will be driven by critical decisions that take advantages associated with the following variables.

Average fare

The response of air passenger demand to increase in average fare is negative, showing that on average, air passenger demand as well as airlines revenue decreases as average air ticket price increases. The implication of this finding is that lowering the ticket price on routes within Africa can increase demand for air travel and consequently lead to growth in the airlines revenue. These results imply that, all things constant, airlines can spur the growth of passengers and revenues on routes of operation by taking measures within their means to reduce the ticket price, such as offering discounts on tickets. Negotiations with governments to reduce sector specific taxes and charges, lower cost of jet fuel, can also help reduce costs and translate to lower ticket prices. Such actions can also significantly reverse the negative effects on revenue growth.

Growth in economic activity

The models show that air passenger demand as well as aviation revenue increases as economies experience increase in economic activities proxied by growth in GDP or per-capita GDP and trade volume. During periods of economic booms, the rising incomes, all things constant, increases aggregate demand for goods and services including air travel. Increased demand for imports and growing volumes of exports also increase quantities of goods transported from one city to another as well as from one region to another. Growth in economic activities therefore provide a positive exogenous shock to the aviation sector. Therefore, measures taken to improve the GDP of any country will by extension result to growth of the aviation sector. Airlines can tap into the advantages of economic expansion by implementing discounts on tickets and bookings during periods of high economic activities in countries. The results also imply that a fall in economic performance hurts the growth of the aviation sector in any African economy.

Corona pandemic

Both air passenger demand and airlines revenue significantly dropped during the corona pandemic. This was due to the closure of borders by most countries to contain the spread of the virus that greatly prohibited passenger travels and a massive negative impact on economic activities arising from lockdowns and cessation of movement. The results are a pointer that post-pandemic economic recoveries will be very critical to the aviation sector. Airlines should aggressively

negotiate for enactment of fiscal and regulatory conditions that will be favorable to them for post pandemic recovery in the sector.

Long distance Operations and Inter-regional operations
Air passenger demand as well as airlines revenues increase with increase in distance and operations on cross regional routes. Airlines that operate on longer routes attract more passengers possibly because for longer distance, air transport is the only convenient and quick means of transport within Africa. Therefore, airlines should expand operations on further apart city pair and interregional routes. The model results also showed that airlines operating at regional level attracted fewer passengers than those operating on cross-regional routes. Revenues were also higher on cross regional routes than on regional routes. Therefore, airlines that are interested in attracting more passengers can expand their operations beyond the regional level. Targeted inter-regional operations can generate more revenues and enhance for growth of the aviation Industry in Africa. This would in turn translate to sector.

Population growth

Air passenger demand and aviation revenue were both shown to be positively associated with growth in population in Africa, suggesting that all things constant, number of people who use air travel increases proportionately with

population. Airlines in Africa can take advantage of the population growth by investing in high capacity carriers and implementing discounts on ticket prices to attract more passengers from the growing Africa's population.

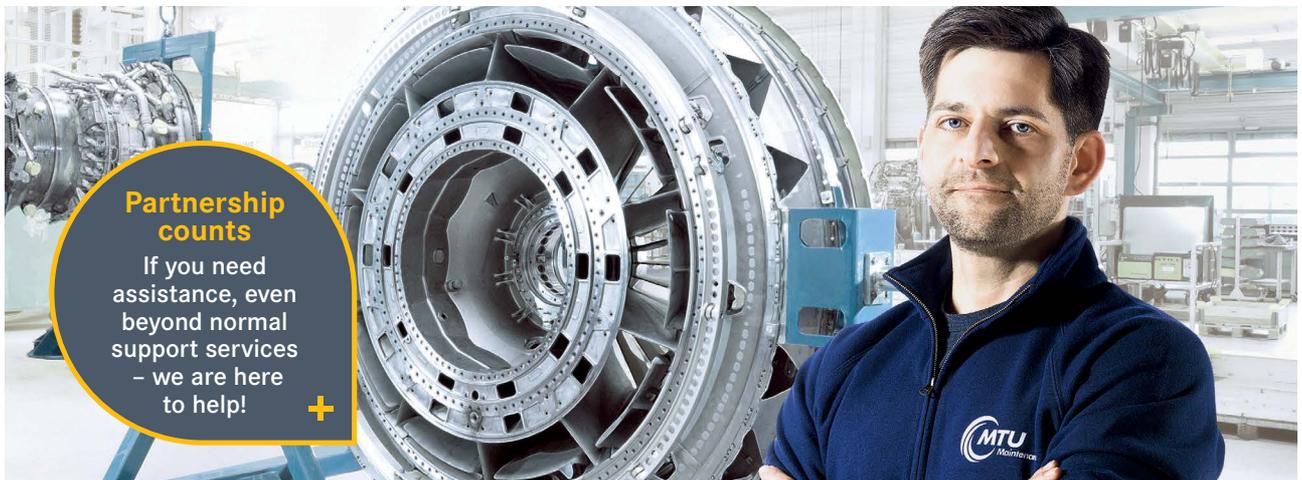
Aviation market liberalisation

Air passenger demand and airlines revenue were established to be on average higher in the period after adoption and implementation of market liberalisation measures. That is after 2018 with the signing of the Single African Air Transport Market (SAATM) agreement. This is a validation that SAATM measure are already impacting the aviation sector positively. Therefore, aviation industry players should mount pressure on full air liberalisation to realise meaningful impacts on growth of the industry. Further, there is need for enhanced coordinated efforts to pressure for full adoption and implementation of the liberalisation agreements to catalyze the industry's growth.

Suggestions for future analysis

The analysis done in this study can be improved if data on volume of cargo transported by air and the cost per unit of cargo transport is available.

The aviation profit forecasting model can also be estimated when historical data is available on jet fuel prices, aviation taxes, airport charges, and cost of cargo transport. 



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