



SINGLE
***AFRICAN AIR
TRANSPORT***
*MARKET BENEFITS AND FUTURE
REGIONAL FLEET REQUIREMENTS*

NOVEMBER 2019 ➔



CHALLENGE.
CREATE.
OUTPERFORM.



LIBERALIZING AVIATION WITHIN AFRICA

During the past century, we have been able to see the extraordinary ability of the free market to promote development and prosperity. This is very well expressed in the recent history of China, and the rebuilding of countries like Germany, South Korea and Japan after periods of conflict.

The free market environment provides fertile ground for better service delivery and greater operational efficiency, both of which provide a higher level of profitability for any sector.

In this context, the Single African Air Transport Market represents one of the most important initiatives for Africa development since it smooths the way for liberalization of traffic rights, capacity, frequency, and pricing. These create more route opportunities and increase African integration.

Such evolution can represent billions of dollars of value-added to the whole of Africa's economy. Its impact on tourism, for instance, is enormous as it can improve access to Africa's natural wonders, landscapes and the hospitality of the African people.

Increasing connectivity would also enhance African access to faster supply-chains, improving economic productivity, enabling investment and innovation in a virtuous cycle of social benefits and wealth generation.

Over the past decades, we at Embraer have had the privilege of participating in the Africa Aviation story. First with our turboprops, then with the ERJs, our E-Jets, and most recently with the E2s starting to crisscross the African sky.

Now we're very excited about the possibilities behind SAATM, an initiative that could represent an airborne revolution in Africa as its skies become more open and free.



RAUL VILLARON

VICE-PRESIDENT
SALES & MARKETING



CONTENTS

- Aviation In Africa
- Economic Impact Rationale
- Forecast Methodology
- SAATM-Ready Country Forecast
- Inter-connectivity Benefits
- Data Sources
- Contacts

EXECUTIVE SUMMARY

A Single African Air Transport Market, or SAATM, will accelerate achieving the main goals of the 1999 Yamassoukro Decision that liberalizes traffic rights, capacity, frequency and pricing to create more route opportunities and increase African integration.

In a study for IATA, InterVistas Consulting measured aviation's economic impact. It founds that a 10% increase in international air services would increase a country's GDP by 0.07%. That figure could reach billions of dollars depending on the size of each country's economy. Its impact on tourism is enormous since air travel facilitates access to Africa's natural wonders, landscapes and the continent's hospitality.

A 2014 study commissioned by IATA estimated the impact of air transport liberalization in twelve countries. Full implementation of the principles of the Yamassoukro Decision would grow air traffic by 18%.

Aviation is an engine for growth and development. It creates jobs, stimulates economic growth, and fosters integration. Increasing connectivity would enhance African access to faster supply-chains thereby improving economic productivity, enabling investment and innovation in a virtuous cycle of social benefits and wealth generation.

Embraer aircraft are ideal for connecting Africa and for reaching new markets. They offer exceptional passenger comfort and better profitability for airlines. Now, with the arrival of the E-Jets E2s, those benefits are even greater.





AVIATION IN AFRICA

From ATAG, Aviation Benefits Beyond Borders (2018)

161
AIRLINES

1,277
AIRCRAFT
IN SERVICE

349
COMMERCIAL
AIRPORTS

36
AIR NAVIGATION
SERVICE PROVIDERS

98
MILLION PAX

1,130,000
FLIGHTS

68%
AVERAGE
REGIONAL LF%

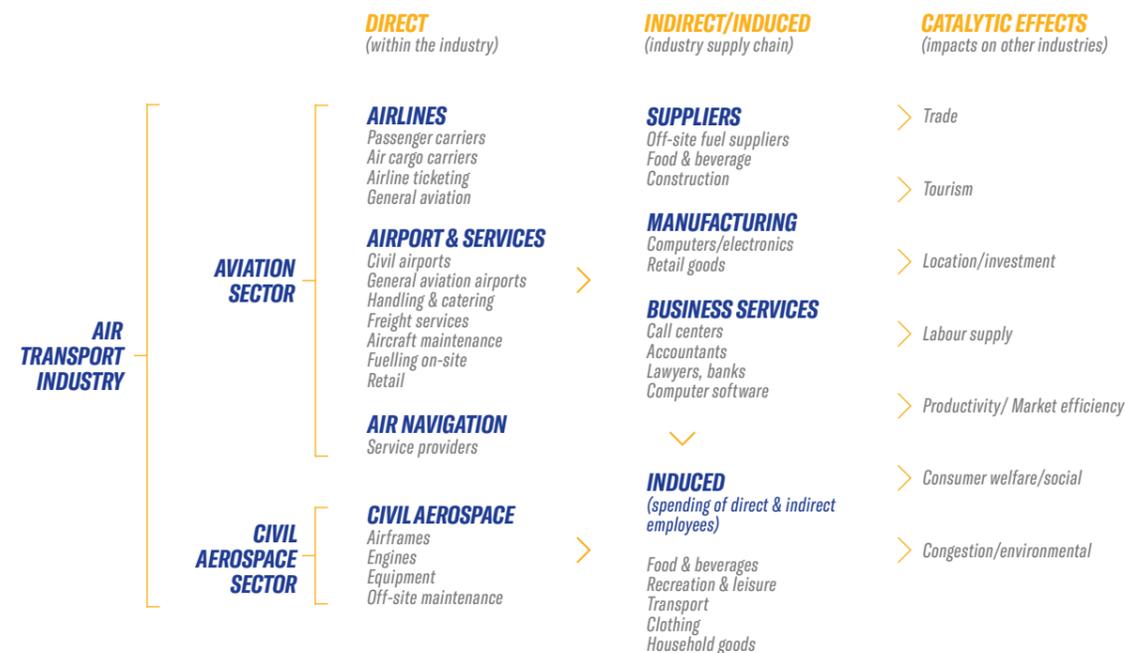
968,000
TONS OF FREIGHT

**AFRICA HAS 2%
SHARE OF GLOBAL
PASSENGER TRAFFIC.**

Source: ATAG

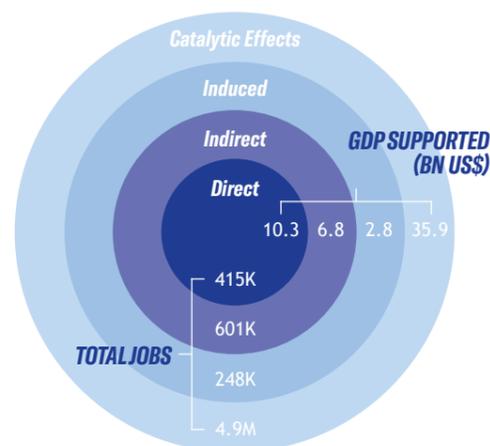
AIR TRANSPORT INDUSTRY ECONOMIC IMPACT

The impact of air transport can be felt throughout an economy. Its direct impact is associated with jobs created by airlines and airports. An important supply chain serves each aircraft which also impacts an economy. Consumer spending flows across all lines of an economy, too. The powerful engine of tourism accounts for a huge portion of the wealth generated by aviation, which acts as a catalyst that benefits many other industries.



Source: Oxford Economics

TOTAL EMPLOYMENT AND GDP SUPPORTED BY AIR TRANSPORT IN AFRICA (2019)



Source: ICAO

The Economic Impact of Air Transportation in Africa was measured by ICAO, in 2019. The employment generation was a total of 6.2 million jobs, being 415 thousand directly associated with the operation. On GDP impact, up to \$55.8 Bn on all its Economic Impacts, being \$10.3 directly associated with the operation.

This Embraer study associates the metric presented to the traffic level of 2019, in RPKs, to generate the proxies that will be used to forecast the Future Economic Impact of Aviation in the ten SAATM-ready countries.

BENEFITS OF AIR TRAFFIC LIBERALIZATION

In 2008, the World Trade Organization used a gravity-type model to explain bilateral passenger traffic. It estimated the impact of liberalizing air transport services on air passenger flows for a sample of 184 countries. The study determined a positive and significant relationship between the volume of traffic and the degree of liberalization. An increase in liberalization increases traffic volume approximately 30% between countries linked by direct air service.

Earlier in 2006, InterVistas, prepared a worldwide economic impact study of air service liberalization. Its research found that after liberalization of air services agreements between countries, traffic typically grew an average of between 12% and 35%. Those rates were significantly higher than during the years preceding liberalization. An updated 2015 study confirmed the average increase to be 16%. The 2006 analysis even showed growth exceeded 50% in several situations. In some cases, the figure was almost 100% of the pre-liberalization rates. The wide variation is explained by the different sizes of each country-pair.

InterVistas also simulated the likely result of liberalizing 320 country-pairs that were not part of any Open Skies agreements. The numbers were impressive. Traffic grew, on average, almost 63%.

Comparatively, the creation of the Single European Aviation Market in 1993 produced annual average traffic growth between 1995 and 2004 that was almost double the rate between 1990 to 1994. That liberalization generated some 1.4 million new jobs.

In 2014, the East African Business Council commissioned InterVistas to measure the benefits of an Open Skies arrangement in East Africa. Through quantitative analysis, the data showed that liberalization would lead to a 41% increase in frequencies and a 9% reduction in fares, both of which would stimulate demand for air travel.

In the present Embraer study, traffic estimates for the ten SAATM ready countries were performed, based on the above mentioned study results, as a conservative average of 40% increase on top of the forecasted traffic, representing the upside benefits that SAATM could potentially bring in 2038.

Sources: InterVistas and World Trade Organization

EMBRAER FORECAST PROCESS

UP TO 150 SEATS - 2019-2038 PROJECTED FLEET

Ten SAATM-Ready Countries

Data sources

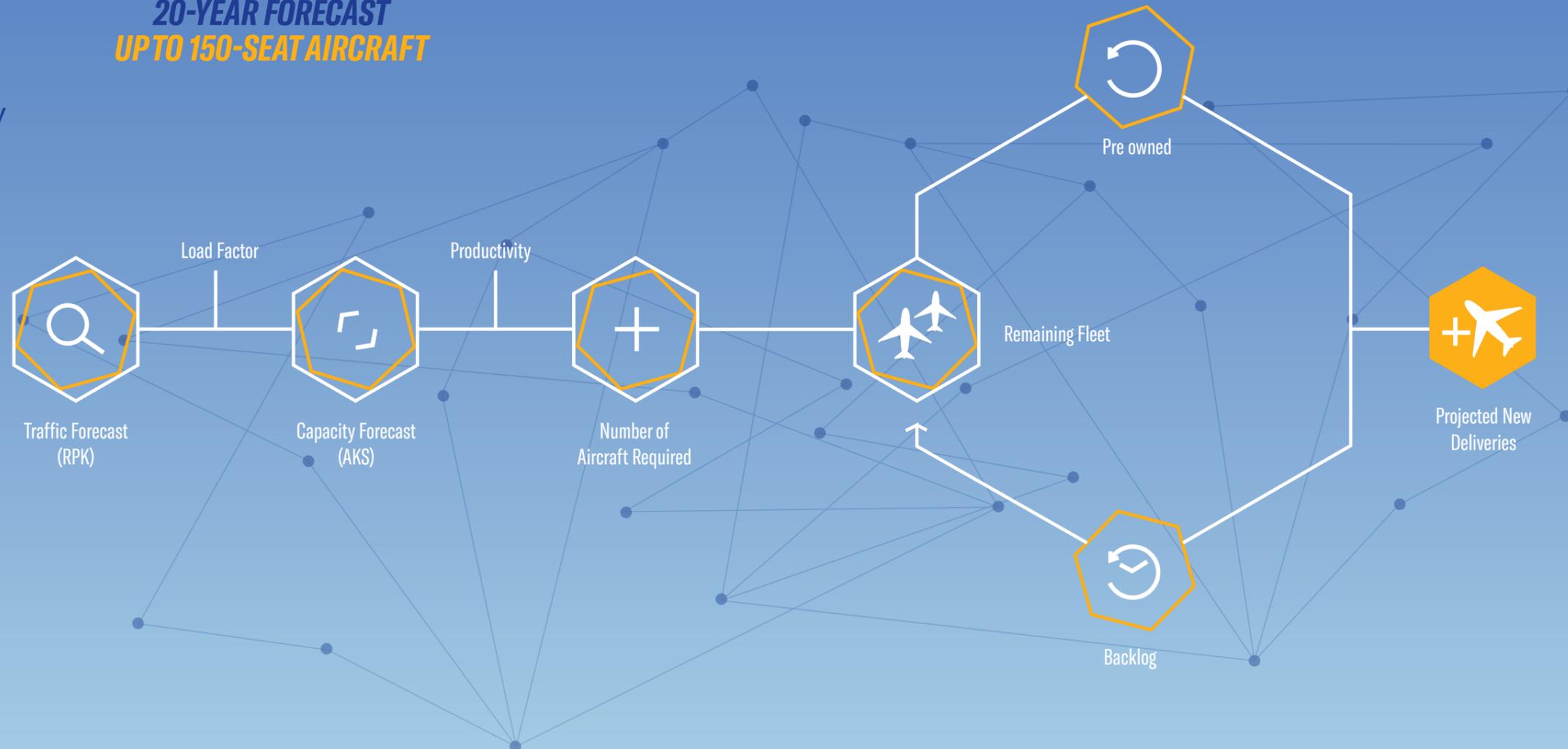


FLEET IN SERVICE **342** 2019 **555** 2038

Sources: Cirium and Embraer



Methodology



Source: Embraer

TEN SAATM-READY COUNTRIES



1. SOUTH AFRICA
2. KENYA
3. MOROCCO
4. ETHIOPIA
5. NIGERIA
6. GHANA
7. MOZAMBIQUE
8. CAPE VERDE
9. RWANDA
10. TOGO

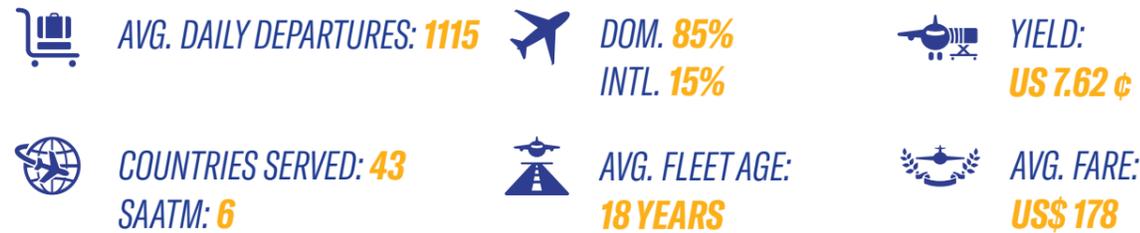




SOUTH AFRICA

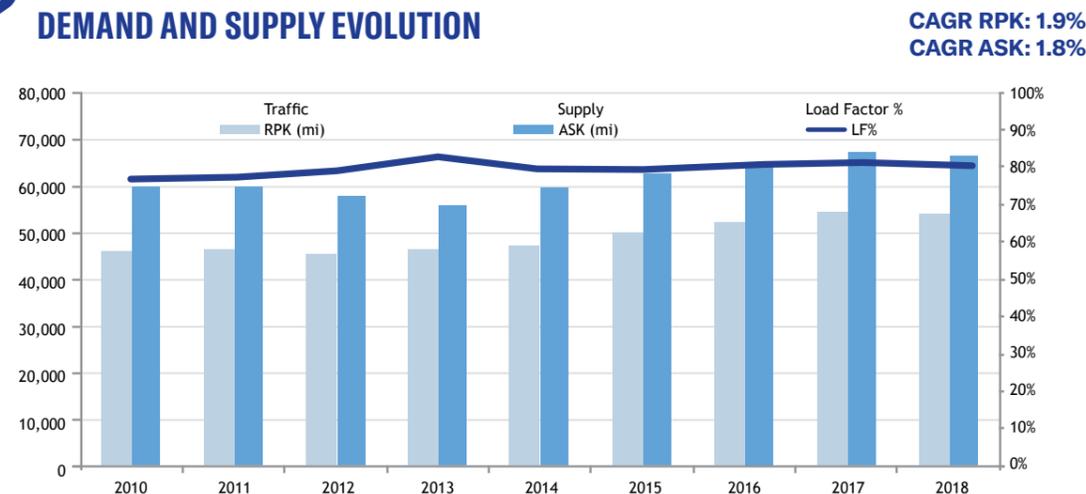
South Africa is the most developed country in Africa, with Johannesburg being the biggest hub of the entire African continent. Five out of ten of the most profitable routes in Africa originate from SA. The country is well connected with the rest of Africa and the world. The domestic market, with multiple daily flights between all the major airports within the country, is well established too.

YEAR: 2018



Sources: Cirium and Sabre

DEMAND AND SUPPLY EVOLUTION



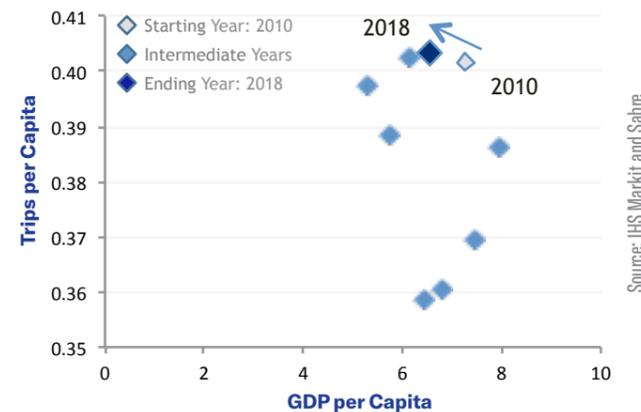
Source: Sabre

In the last decade traffic has grown modestly (2% CAGR). Implementing SAATM agreement will boost the growth in the next 20 years, reaching a CAGR of 4.8%.

PROPENSITY TO TRAVEL

IHS Markit assumed modest recovery in South Africa's GDP growth rate to 1.4% in 2019. The budget deficit is expected to average 4.3% of GDP in 2019-21.

It is expected that limited upward momentum exists to propel the economy to a higher growth path for the remainder of 2019. Travel propensity was positive in the last decade, yet the absolute number of per capita trips was low.

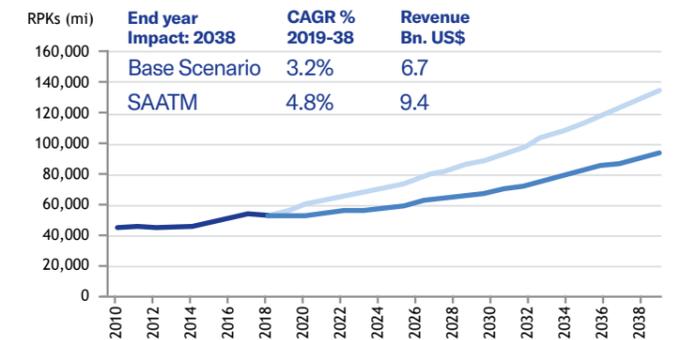


SAATM ESTIMATED IMPACT IN 2038

TRAFFIC AND REVENUE

Using the econometric model of traffic associated with future GDP, it is expected that aviation in South Africa will keep growing at 3.2% annually between 2019 and 2038. With the additional benefits that SAATM would bring, the growth rate could be up to 4.8%.

Source: Embraer, Sabre, IHS Markit



FLEET SIZE

Although there is an established fleet of up to 150-seat aircraft in the country, it represented only about 14% of all ASKs generated by South African carriers in 2018.

There is huge potential to untap with the implementation of SAATM to further improve intra-regional and domestic connectivity.

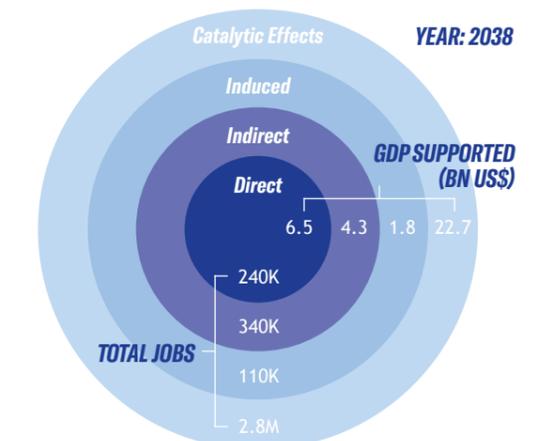
Source: Embraer



ECONOMIC IMPACT

Using future traffic forecasts under SAATM and economic impact assumptions from ICAO for Africa, South African aviation in 2038 is expected to employ 240,000 workers and provide up to 3.5 million summing the indirect jobs and the catalytic effects of tourism. Air transport will generate US\$6.5 billion directly for the national economy and account for up to US\$35.3 billion of associated economic activity.

Source: Embraer, Sabre, IHS Markit, ICAO





KENYA

Air transport is a major driver in Kenya's economy, supporting tourism and attracting multinational companies and foreign investment in the country. Aviation accounts for 4.6 per cent of Kenya's GDP. Implementing SAATM agreement will further boost connectivity between the country and the rest of the continent.

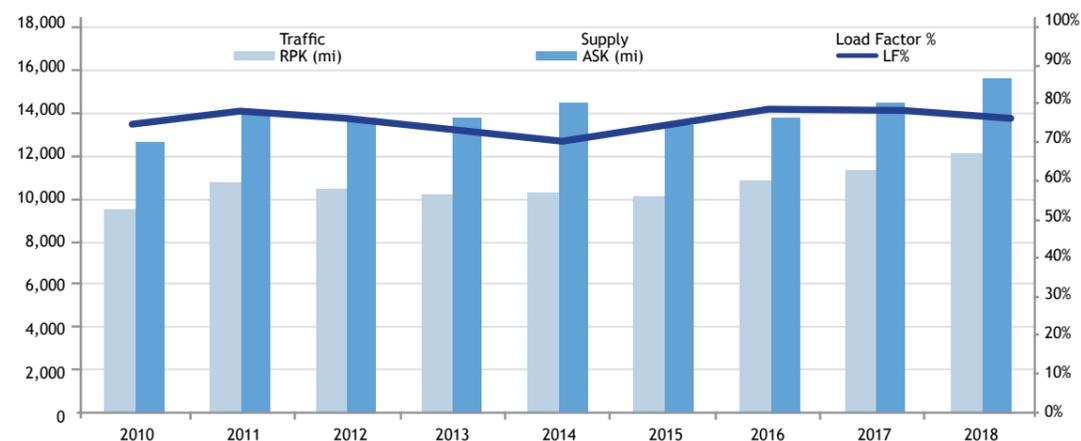
YEAR: 2018



Sources: Cirium and Sabre

DEMAND AND SUPPLY EVOLUTION

CAGR RPK: 2.9%
CAGR ASK: 2.2%



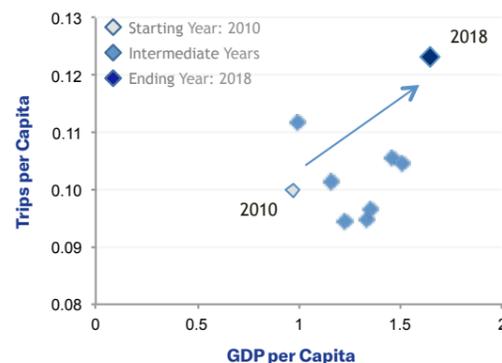
Source: Sabre

The overall number of domestic and international departure seats has increased by more than three quarters since 2010. The growth of Kenya's domestic market, in particular, has accelerated over the past three years, increasing with an average annual growth of 30%. Domestic capacity has risen from 1.95 million departure seats in 2010 to 5.18 million this year, while international capacity has grown from 3.88 million to 5.1 million over the same period.

PROPENSITY TO TRAVEL

Kenya is showing consistent growth in both GDP per Capita and Trips per Capita. However, the propensity to travel is still low compared to worldwide levels.

Source: IHS Markit and Sabre



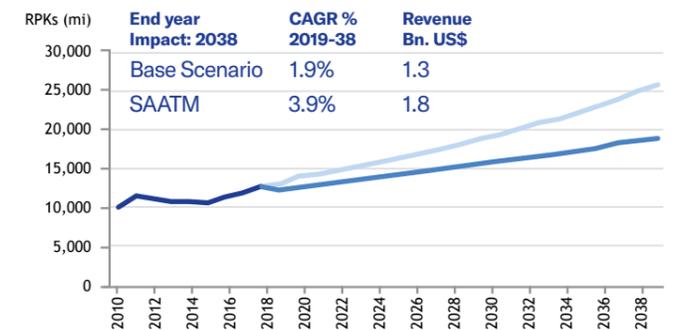
SAATM ESTIMATED IMPACT IN 2038

TRAFFIC AND REVENUE

Kenya has a positive outlook for GDP growth with derived traffic tracking upward.

Twenty-year estimates forecast a compound annual growth rate of 2.4% between 2019 and 2038. SAATM implementation would see a significantly higher rate of up to 3.9%.

Source: Embraer, Sabre, IHS Markit



FLEET SIZE

Between the ten SAATM-ready countries, Kenya is the one with the largest fleet of aircraft up to 150 seats. That fleet can potentially get close to 200 aircraft threshold, making Kenya an leader in intra-regional and domestic connectivity in the region.

Source: Embraer

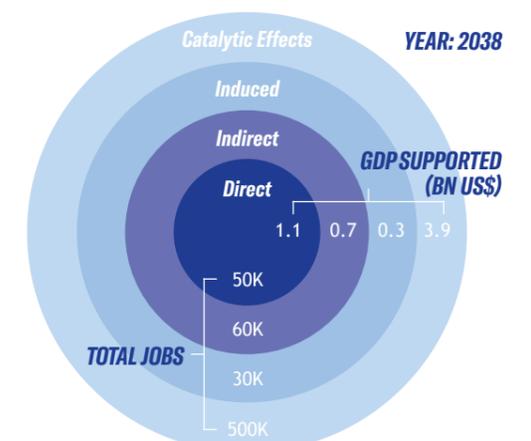
Up to 150-Seat aircraft segment



ECONOMIC IMPACT

Using future traffic forecasts under a SAATM and economic impact assumptions from ICAO for Africa, the derived economic effect on Kenya would be US\$6.0 billion in GDP contribution and the creation of 650,000 jobs in 2038. Some 50,000 jobs would be directly associated with airline operations. Direct economic impact is estimated at US\$1.1 billion.

Source: Embraer, Sabre, IHS Markit, ICAO





MOROCCO

SAATM would enable Morocco to further expand its intra-African network, enhancing connectivity between Africa and the rest of the world, using its already extensive network.

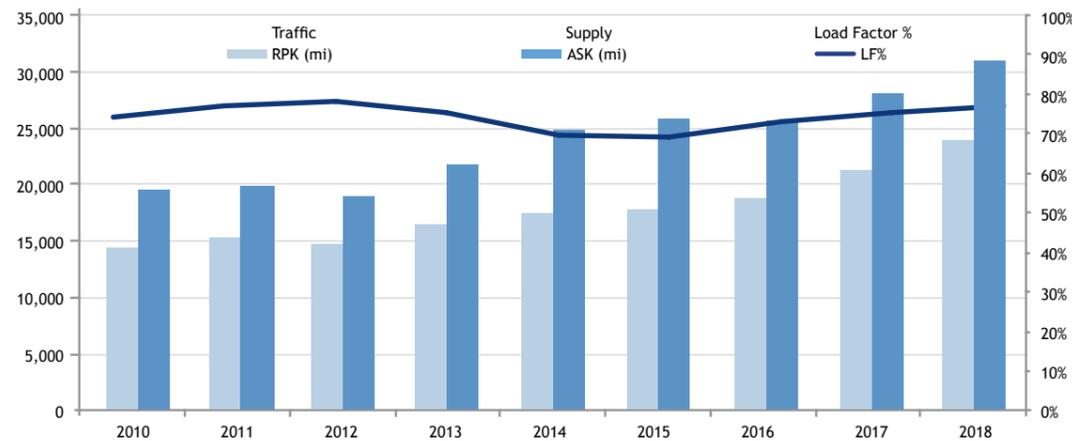
YEAR: 2018



Sources: Cirium and Sabre

DEMAND AND SUPPLY EVOLUTION

CAGR RPK: 6.2%
CAGR ASK: 5.8%

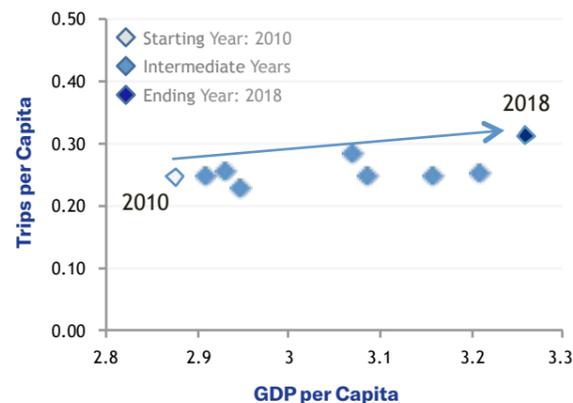


Source: Sabre

With SAATM, African destinations would grow considerably. Sustainability and probability can only be achieved with right size aircraft, increasing frequencies and enabling connectivity.

PROPENSITY TO TRAVEL

Morocco in almost a decade increased its propensity to travel figures, both in terms of GDP per Capita and in Trips per capita.

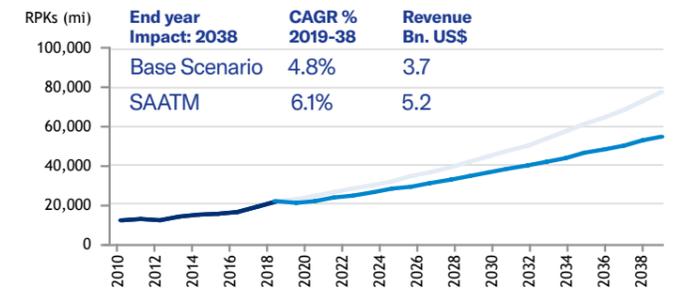


Source: IHS Markit and Sabre

SAATM ESTIMATED IMPACT IN 2038

TRAFFIC AND REVENUE

According to long-term GDP projections, Morocco is expected to maintain positive traffic growth of 4.8% annually from 2019 to 2038. SAATM would boost that rate to 6.1% compounded annually.



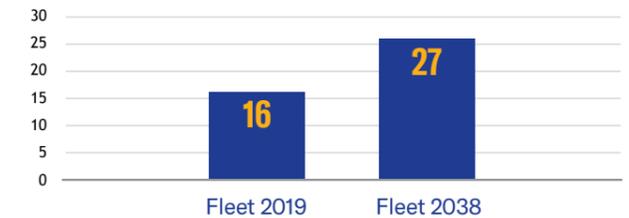
Source: Embraer, Sabre, IHS Markit

FLEET SIZE

Morocco could greatly benefit from the expansion of Africa's intra-regional traffic untapped by SAATM. Because of its geographic location, it could be also connect people from all over the continent to Western Europe.

Source: Embraer

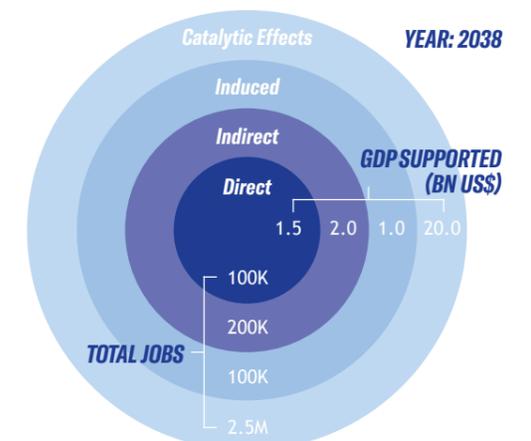
Up to 150-Seat aircraft segment



ECONOMIC IMPACT

Using future traffic forecasts under SAATM and economic impact assumptions from ICAO for Africa, Morocco aviation in 2038 is expected to employ 100,000 workers and provide up to 2.9 million summing the indirect jobs and the catalytic effects of tourism. Air transport will generate US\$1.5 billion directly for the national economy and account for up to US\$24.5 billion of associated economic activity.

Source: Embraer, Sabre, IHS Markit, ICAO





ETHIOPIA

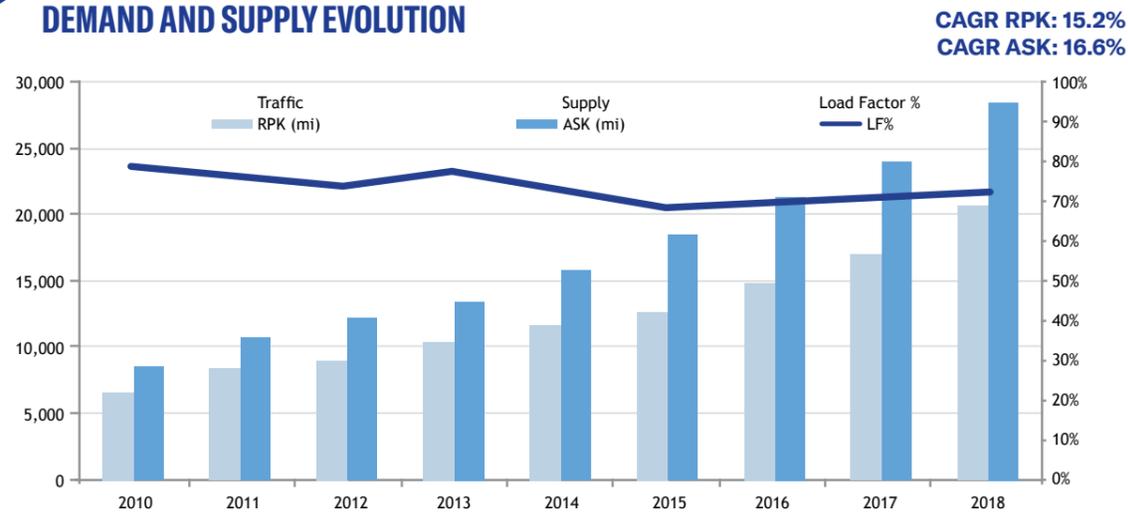
Ethiopia is an excellent example of a virtuous circle connecting economic development and improving connectivity. Rapid growth of Ethiopian airlines and Addis Ababa hub contributes to the country's impressive GDP growth, in turn, one of the fastest growing economies in the world is stimulating the demand for air travel and fueling the growth of the national carrier.

YEAR: 2018



Sources: Cirium and Sabre

DEMAND AND SUPPLY EVOLUTION



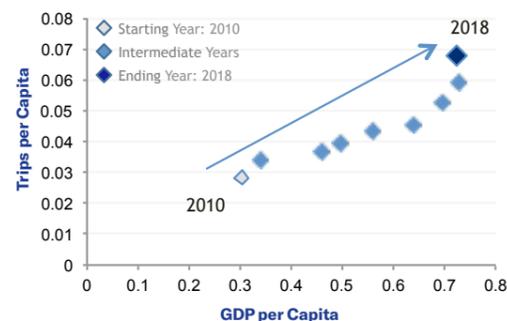
Source: Sabre

In terms of traffic and capacity growth in the last decade Ethiopia comes only second to Rwanda among the SAATM ready countries. Given the country size this development is even more impressive. Despite such aggressive growth load factors remain at healthy 70%+ levels. Going forward, however, there is some room for "right-sizing" – capacity discipline would help drive the load factors closer to the global average (82%).

PROPENSITY TO TRAVEL

Propensity to travel in Ethiopia closely follows the impressive growth of GDP/capita. At 0.07 trips/capita country is still way below global average (0.6 trips/capita), which leaves a lot of room for further growth. When combined with country's growing population, this provides a very strong base for future development of country's aviation sector.

Source: IHS Markit and Sabre

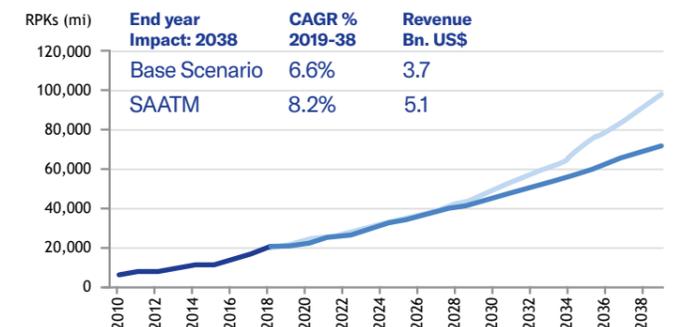


SAATM ESTIMATED IMPACT IN 2038

TRAFFIC AND REVENUE

With strong economic foundations and ambitious and comprehensive growth strategies in place (e.g. "Vision 2010", "Vision 2025") even in the base scenario traffic is expected to grow at the annual rate of 6.6%, which is almost double of the global growth rates. SAATM implementation would bring more flexibility in designing the regional and inter-regional route network and support building even more robust hub structure in ADD. In this scenario growth rates can go as high as 8.2% per year.

Source: Embraer, Sabre, IHS Markit

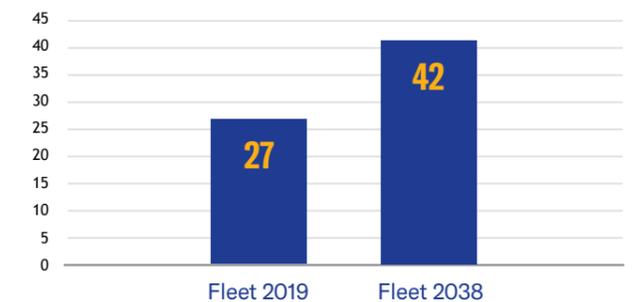


FLEET SIZE

Sub-150 segment already constitutes more than 1/3 of the country's fleet. With SAATM, the relevance of this segment will only grow. The opportunity to open the connections to 2nd tier cities across the continent as well as increased number of frequencies on existing markets will favor the smaller gauge aircraft.

Source: Embraer

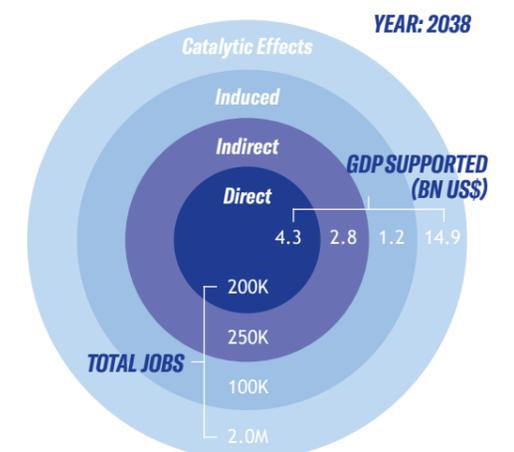
Up to 150-Seat aircraft segment



ECONOMIC IMPACT

Ethiopia can derive huge economic benefits from air transport liberalization through SAATM. Using future traffic forecasts under SAATM and economic impact assumptions from ICAO for Africa to 2038, Ethiopia would see US\$4.3 billion in direct GDP contribution and up to US\$23.2 billion when including all the derived benefits. Some 200,000 jobs would be directly linked to aviation, and up to 2.5 million associated jobs would be created.

Source: Embraer, Sabre, IHS Markit, ICAO





NIGERIA

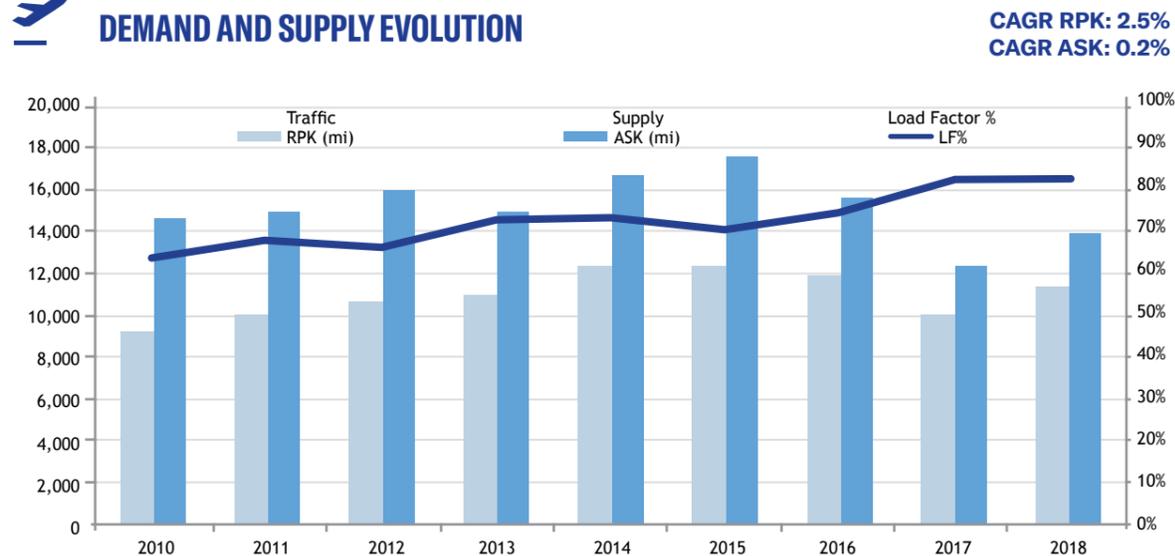
As demand grows in Nigeria, existing airlines are strengthening their network with new destinations and more frequencies, but also modernizing their fleet. New players are appearing in the country and SAATM would bring more development opportunities.

YEAR: 2018



Sources: Cirium and Sabre

DEMAND AND SUPPLY EVOLUTION



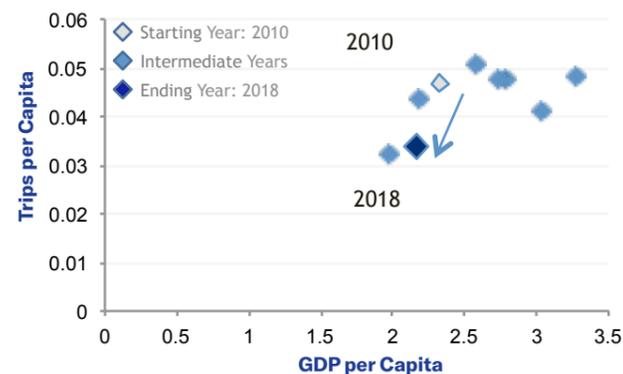
Source: Sabre

Nigerian aviation saw a reduction in Available Seat Kilometers in 2017. It has since regained momentum and is showing signs of growth with positive Revenue Passenger Kilometers and high load factors.

PROPENSITY TO TRAVEL

Nigeria has seen variations in GDP per Capita and Trips per Capita which have trended slightly downward albeit from low absolute values. Since Nigeria has a population of nearly 200 million, there is room for great advancements in its air transport industry.

Source: IHS Markit and Sabre

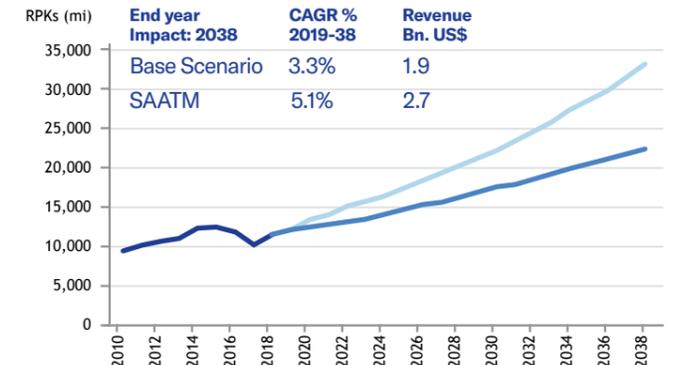


SAATM ESTIMATED IMPACT IN 2038

TRAFFIC AND REVENUE

Following the econometric forecast of aviation traffic as a function of GDP, passenger volume to/from Nigeria is expected to keep growing at 3.3% annually. Implementing SAATM could increase that to 5.1% CAGR.

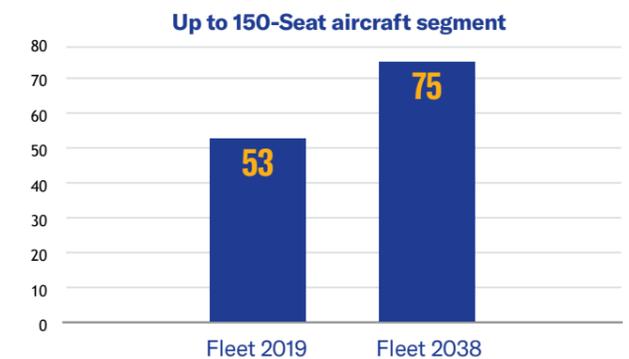
Source: Embraer, Sabre, IHS Markit



FLEET SIZE

Nigeria is in the process of renewing and expanding its regional fleet with modern, state-of-the-art aircraft. If the country's airlines keep up the pace and with SAATM's additional push, Nigeria can unleash its full potential to become one of the main players on the continent.

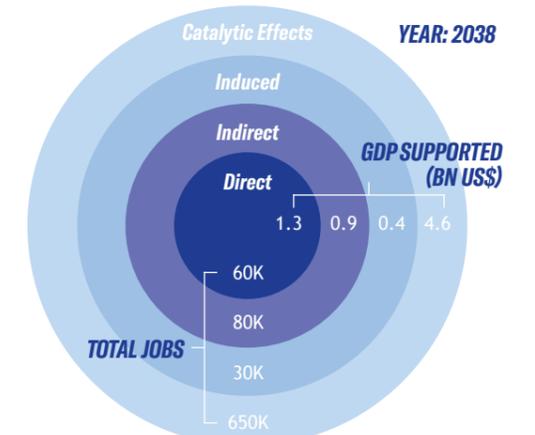
Source: Embraer



ECONOMIC IMPACT

The economic impact of air transport liberalization will be hugely beneficial to Nigeria. In 2038, using traffic forecasts and economic impact estimates from ICAO, aviation could generate 800,000 jobs of which 60,000 would be directly associated with airline operations. The industry would contribute some US\$1.3 billion to GDP. That number would rise to US\$7.2 billion when factoring the induced and indirect catalytic effects of tourism.

Source: Embraer, Sabre, IHS Markit, ICAO





GHANA

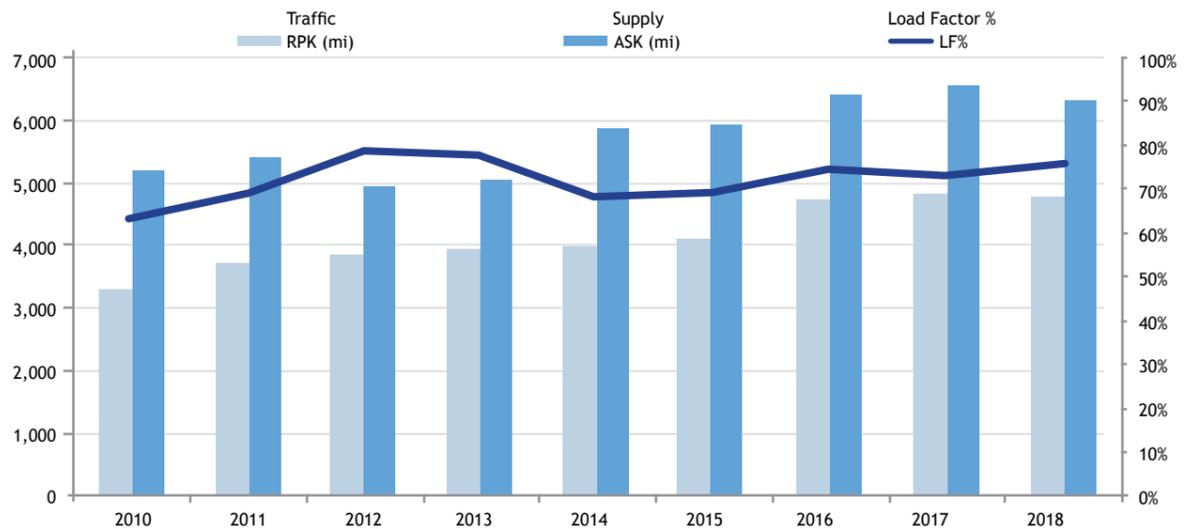
Air traffic liberalization would open more routes to Ghana and unleash the country's tremendous potential. Air traffic has been growing steadily. Rights to access new markets would bring new benefits.

YEAR: 2018



Sources: Cirium and Sabre

DEMAND AND SUPPLY EVOLUTION



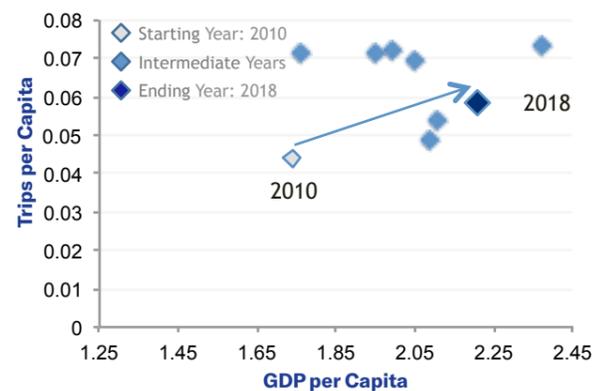
Source: Sabre

Air traffic in Ghana grew at the worldwide rate for nearly a decade. There is room for expansion on the supply side since it has only increased half as much as demand. Load-factors are close to the world average of 80%.

PROPENSITY TO TRAVEL

Ghana has seen variations in its GDP per Capita and Trips per Capita. Despite a positive propensity to travel trend, the country still ranks below worldwide levels.

Source: IHS Markit and Sabre

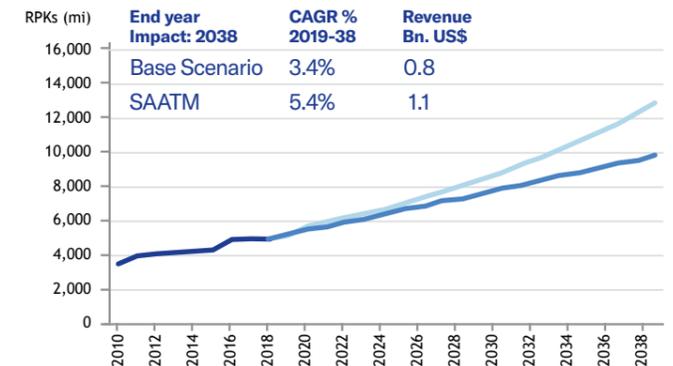


SAATM ESTIMATED IMPACT IN 2038

TRAFFIC AND REVENUE

Ghana's traffic as a function of GDP forecasts is expected to keep growing 3.4% annually over the next 20 years. SAATM implementation can improve the CAGR to 5.4% per year from 2019 until 2038.

Source: Embraer, Sabre, IHS Markit



FLEET SIZE

There is room for a significant increase in the size of the national fleet. Traffic demand is there and it is expected to grow at an even higher pace with SAATM. The up to 150-seat aircraft segment will be essential in connecting domestic and intra-regional markets to the rest of the continent, and to the world.

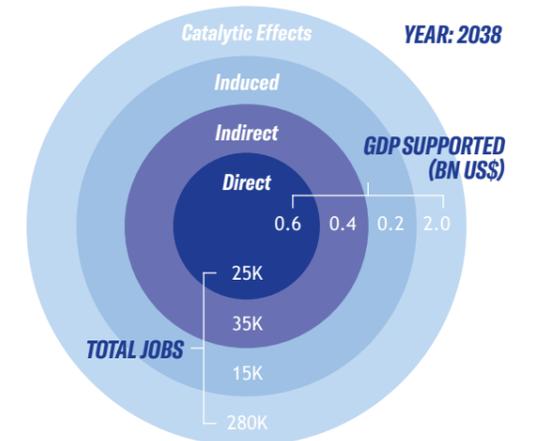
Source: Embraer



ECONOMIC IMPACT

Ghana's economy can make great gains from air transport liberalization. Based on ICAO economic assumptions and traffic forecasts to 2038, Ghana could see aviation directly accounting for US\$0.6 billion of GDP and up to US\$ 3.2 billion when considering all its derived benefits. Some 25,000 jobs would be directly linked to aviation and up to 350,000 jobs when all the associated economic effects are included.

Source: Embraer, Sabre, IHS Markit, ICAO





MOZAMBIQUE

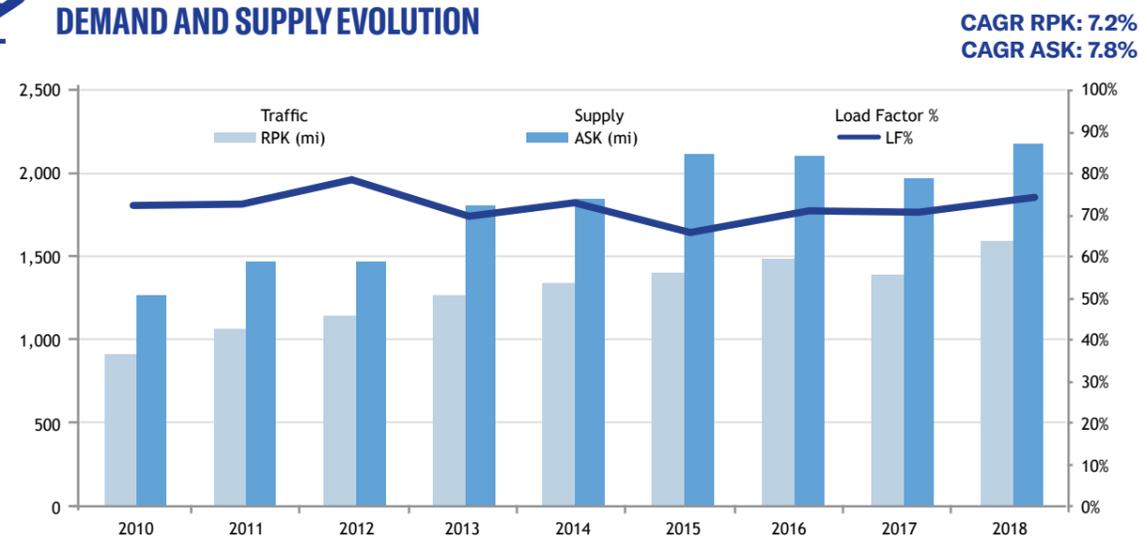
Mozambique's large geographic size combined with SAATM implementation across Africa will continue to drive traffic growth at steady rate while likely connecting more regional markets to the country. The below 150 seat aircraft market in Rwanda is expected to double consequently.

YEAR: 2018



Sources: Cirium and Sabre

DEMAND AND SUPPLY EVOLUTION

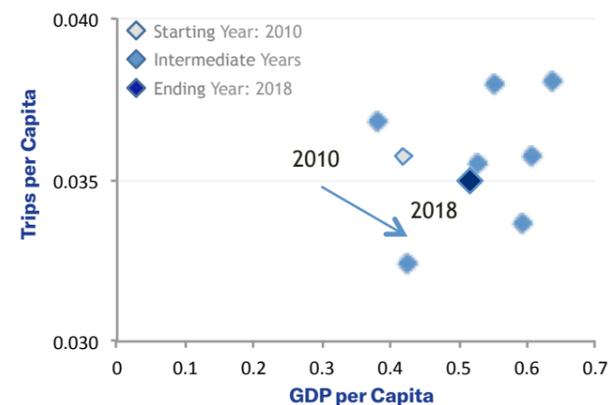


Source: Sabre

With Mozambique recently offering the most liberal air traffic rights on the continent, demand has remained above industry trends both in Africa and Globally.

PROPENSITY TO TRAVEL

The propensity to travel measured in Trips per Capita and GDP per Capita shows fluctuations in Mozambique's economy having an impact. In absolute terms, the variations are slight. The higher the index, the more likely residents will fly more.



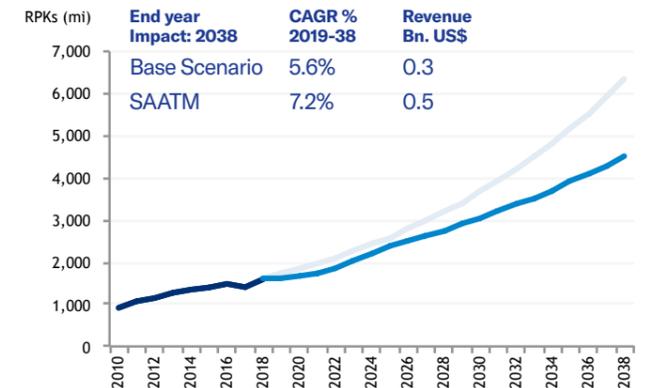
Source: IHS Markit and Sabre

SAATM ESTIMATED IMPACT IN 2038

TRAFFIC AND REVENUE

The long-term economic outlook Mozambique is expected grow air traffic at a 5.6% CAGR rate between 2019 and 2038. Implementation of SAATM could raise that to 7.2%.

Source: Embraer, Sabre, IHS Markit

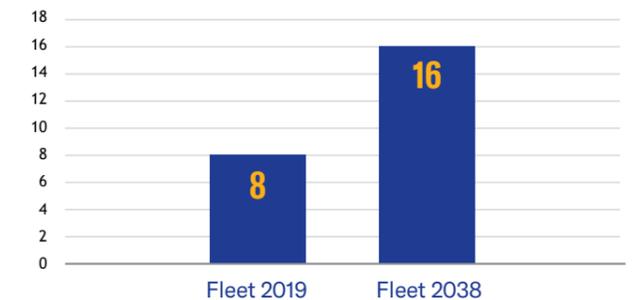


FLEET SIZE

Mozambique is another example of a country with huge potential to expand the nation's regional fleet. With SAATM, Mozambique could more easily be connected to important hubs on the continent and to the rest of the world.

Source: Embraer

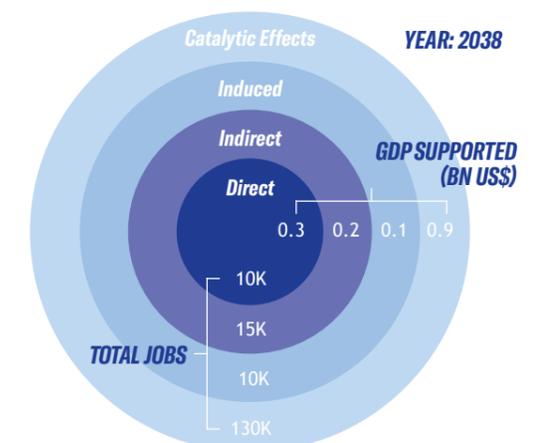
Up to 150-Seat aircraft segment



ECONOMIC IMPACT

Based on forecasts and ICAO economic assumptions for Africa, Mozambique would profit from air transport liberalization. Aviation would directly contribute US\$300 million to GDP and employ some 10,000 people. The indirect economic impact would be US\$1.5 billion and up to 165,000 jobs in 2038.

Source: Embraer, Sabre, IHS Markit, ICAO





CAPE VERDE

CAPE VERDE

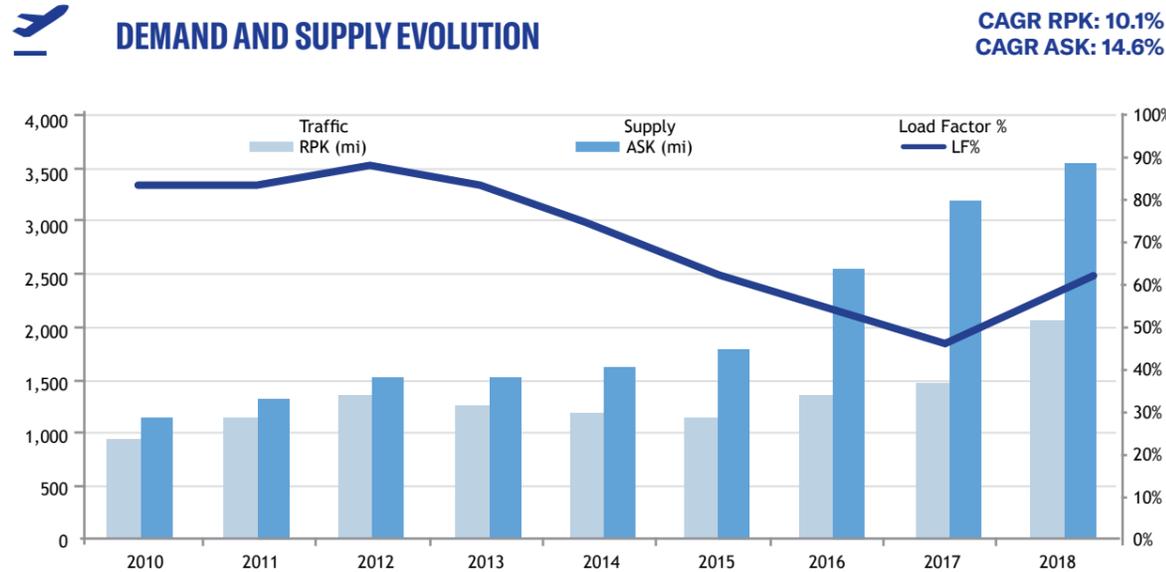
For the booming Cape Verde tourism sector aviation is crucial. So far most of the capacity was coming from seasonal flights to/from Europe. Recent opening of new long-haul routes should change this picture. SAATM can open further opportunities to diversify the network and balance the seasonality.

YEAR: 2018



Sources: Cirium and Sabre

DEMAND AND SUPPLY EVOLUTION



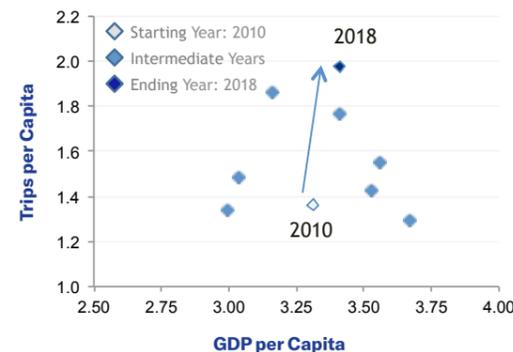
Source: Sabre

Cape Verde market is still immature, but growing dynamically over last years. With a relatively small base and high seasonality the highly fluctuating load factors are not surprising.

PROPENSITY TO TRAVEL

The Cape Verde passengers' numbers to large extent are determined by the inbound traffic. Propensity to fly is also boosted by Cape Verde being an island state. This results in Cape Verde leadership position among the SAATM ready countries. However, positive economic outlook and traffic rights liberalization can drive this metric further up – it's not uncommon for other island states to have 10 trips/capaita or more.

Source: IHS Markit and Sabre

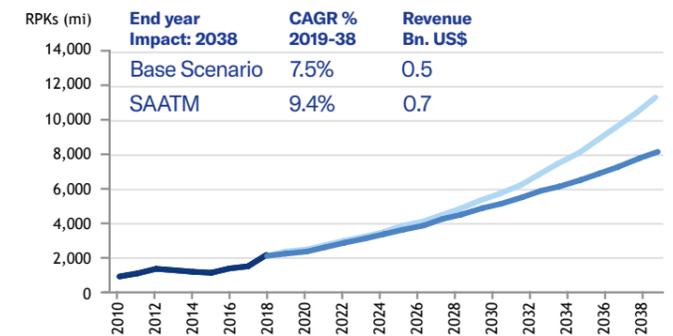


SAATM ESTIMATED IMPACT IN 2038

TRAFFIC AND REVENUE

The Cape Verde is expected to be one of the fastest growing African aviation markets. Number of factors are contributing: rapid growth in tourism, development of long-haul routes, and diversification of the country's economy. SAATM can "supercharge" this growth, helping to develop the African traffic flows – alternative to the prevailing European traffic.

Source: Embraer, Sabre, IHS Markit

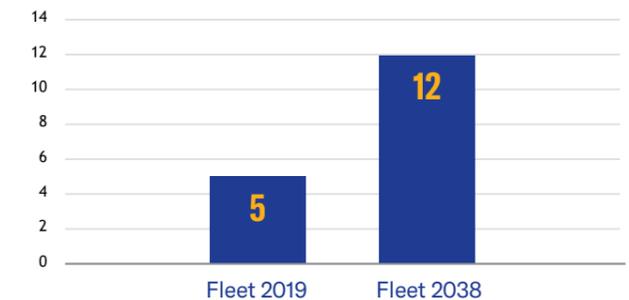


FLEET SIZE

Cape Verde will always need smaller gauge aircraft for the inter-island operations. Moreover, development of new services to the continental Africa would enhance the demand for the sub-150 seats aircraft – they are the optimum "route-openers".

Source: Embraer

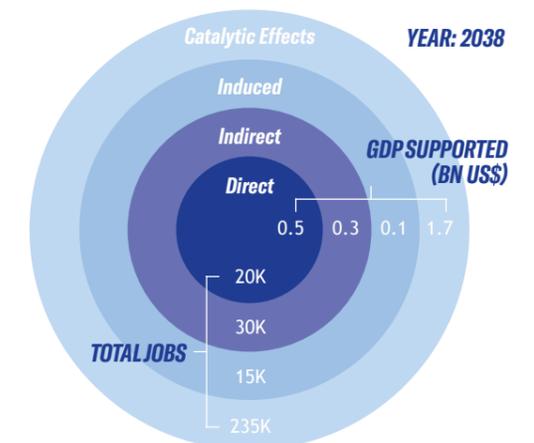
Up to 150-Seat aircraft segment



ECONOMIC IMPACT

Using future traffic forecasts and economic impact assumptions from ICAO, aviation in Cape Verde will support 20,000 direct jobs, and 300,000 jobs from the indirect and induced catalytic effects of tourism in 2038. Air transport will generate US\$500 million of economic benefits directly up to US\$2.7 billion indirectly.

Source: Embraer, Sabre, IHS Markit, ICAO





RWANDA

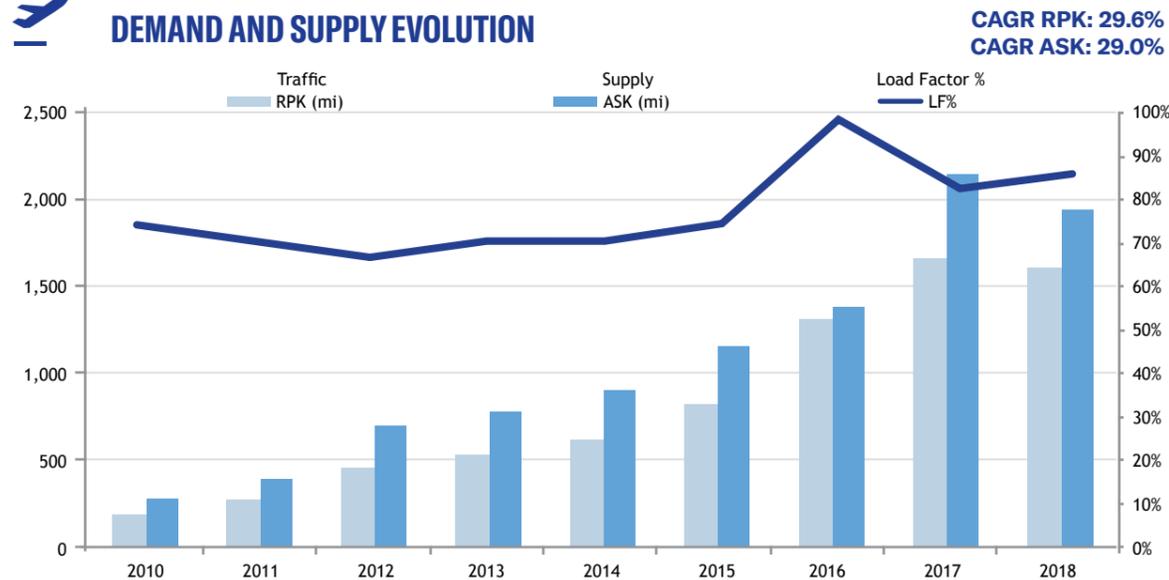
SAATM forecasts double digit percentage air traffic growth in Rwanda, enhancing connectivity and demand. The below 150 seat aircraft market in Rwanda is expected to double consequently.

YEAR: 2018



Sources: Cirium and Sabre

DEMAND AND SUPPLY EVOLUTION



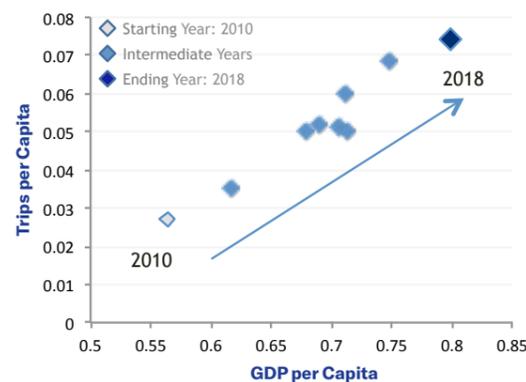
Source: Sabre

Rwanda has been a key player in air traffic liberalization over the past decade which has attributed to its positive trending traffic growth, driven by its national carrier, Rwandair. In the last decade, traffic has grown tremendously at an average rate of 30% per year.

PROPENSITY TO TRAVEL

Among the ten SAATM-ready countries, Rwanda has the highest propensity to travel. Yet despite the tremendous growth, it is still well below worldwide levels.

Source: IHS Markit and Sabre

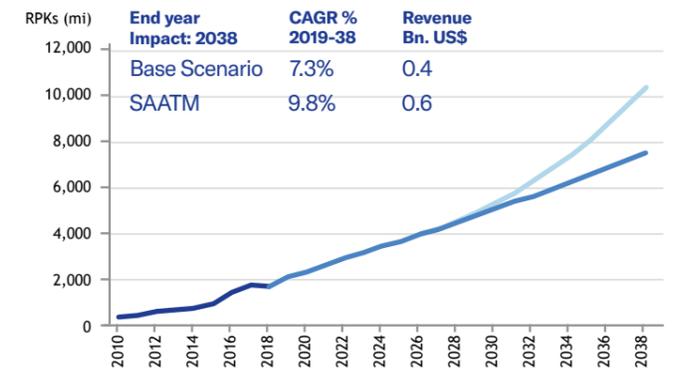


SAATM ESTIMATED IMPACT, IN 2038

TRAFFIC AND REVENUE

Air traffic growth in Rwanda is one of the highest in Africa. It is forecast at 7.3% compounded annually between 2019 and 2038. With SAATM, that rate could increase to 9.8% CAGR.

Source: Embraer, Sabre, IHS Markit

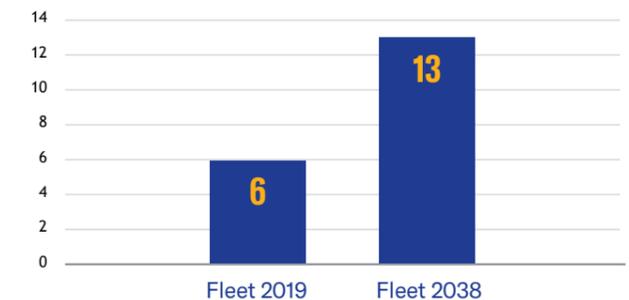


FLEET SIZE

Traffic has been increasing steadily over the last decade. Liberalization under SAATM would link the country with more of the continent and the rest of the world. Up to 150-seat aircraft can drive that connectivity.

Source: Embraer

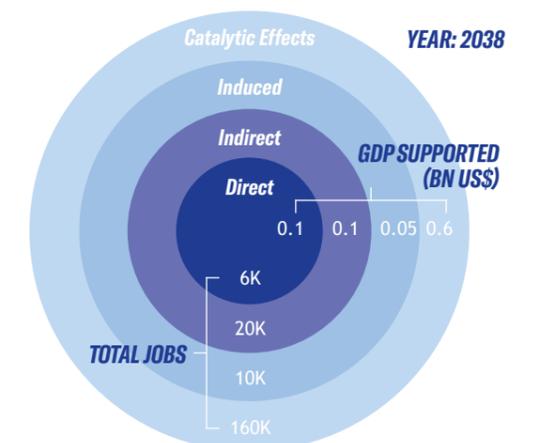
Up to 150-Seat aircraft segment



ECONOMIC IMPACT

Rwanda stands to gain economically from SAATM. In 2038, using traffic forecasts and economic assumptions from ICAO, aviation will employ 196,000 people, 6,000 of which will be directly associated with airline operations. Aviation will have a direct impact on GDP of US\$100 million. The induced and indirect catalytic effects of tourism will represent up to US\$ 850 million.

Source: Embraer, Sabre, IHS Markit, ICAO





TOGO

Togo is the only of the ten SAATM-ready countries that only has international flights. Air transport liberalization in the region would boost Togo's network, which has a lot of potential to grow frequencies and destinations.

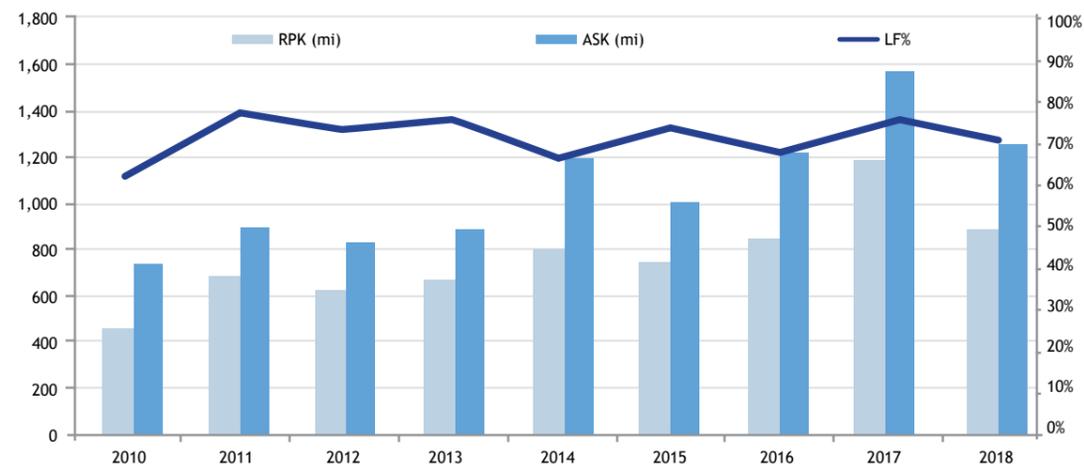
YEAR: 2018



Sources: Cirium and Sabre

DEMAND AND SUPPLY EVOLUTION

CAGR RPK: 8.5%
CAGR ASK: 6.7%

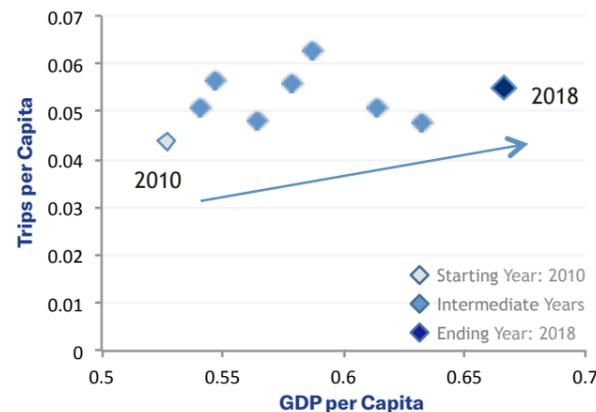


Source: Sabre

Demand and supply have significantly grown over the last decade. However, load factors are below the world's average. This is an excellent opportunity for right-sizing the fleet and increasing frequencies.

PROPENSITY TO TRAVEL

The propensity to travel has been fluctuating with the economy of Togo. The rate is positive albeit with low absolute numbers.



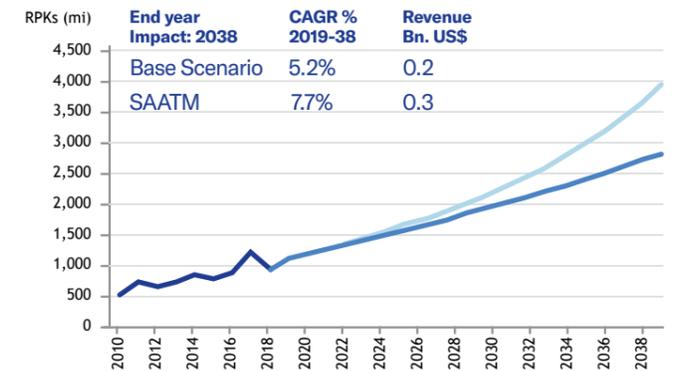
Source: IHS Markit and Sabre

SAATM ESTIMATED IMPACT, IN 2038

TRAFFIC AND REVENUE

According to long-term GDP projections, Togo is expected to maintain positive traffic growth of 5.2% annually from 2019 to 2038. SAATM would boost that rate to 7.7% compounded annually.

Source: Embraer, Sabre, IHS Markit

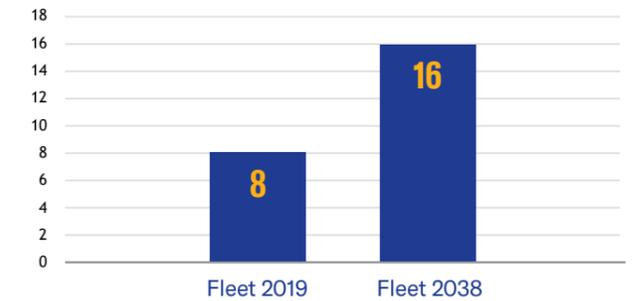


FLEET SIZE

With an excellent geographical location, Togo will be a key player in connecting western Africa. Low gauge aircraft will enable this network development, bringing more frequencies and higher load factors.

Source: Embraer

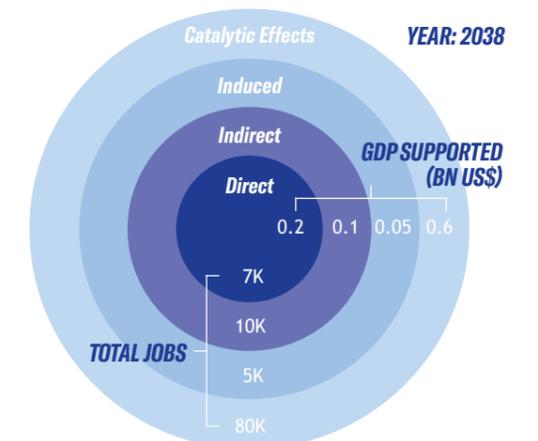
Up to 150-Seat aircraft segment



ECONOMIC IMPACT

Air traffic forecasts and ICAO assumptions show the total economic impact of SAATM on Togo's GDP to be up to US\$ 0.9 billion and the creation of 100,000 jobs by 2038. Some 7,000 jobs will be directly linked to airline operations. The direct economic impact of aviation is estimated at US\$ 170 million.

Source: Embraer, Sabre, IHS Markit, ICAO



INTER-CONNECTIVITY BENEFITS

Existing frequencies to main airports

Route exercise of linking all ten

SAATM ready countries



Source: Sabre, Ref. Nov-18

INTER-CONNECTIVITY BENEFITS

With the SAATM it is expected that many new frequencies will be opened. Increasing the connectivity among the ten SAATM ready countries. To measure its benefit, this study used the Connection Index, which is calculated per the following formula:

Number of destinations x Frequency x Seats per flight weighted by the size of the destination airport. Divided by a scalar factor of 1000.

Where:

Number of destinations: among the ten countries of the study;

Frequency: weekly frequencies linking each country-pair;

Seats/flight: an average of seats available per departure;

Weighting by airport size: Percentage of the processed passenger totals in the main international airport of the selected country, compared to the largest airport in the world, which in 2018 was Atlanta (ATL).

Source: IATA

Examples:

City - Airport	Beijing - PEK	London - LHR	Chicago - ORD	Sydney - SYD	São Paulo - GRU
Connection Index	384.8	358.5	274.8	157.2	81.0

Source: Embraer, Sabre - Nov. 2018

WEEKLY FREQUENCIES AMONG THE TEN SAATM READY COUNTRIES:

DESTINATION

ORIGIN	Country-pairs	DESTINATION									
		Morocco	Cape Verde	Ghana	Togo	Nigeria	South Africa	Mozambique	Rwanda	Kenya	Ethiopia
Morocco	-	1	3		6						
Cape Verde	1	-									
Ghana	3		-	12	83	8			7	7	
Togo	4		16	-	16					4	
Nigeria	6		85	12	-	7		11	10	18	
South Africa			8		7	-	77	7	33	29	
Mozambique						79	-		11	7	
Rwanda					11	7		-	28	10	
Kenya			7		10	33	7	29	-	51	
Ethiopia			7	4	18	29	7	8	53	-	

Reference: First week of November-2018

Source: Sabre

In the countries not yet linked by a direct flight, for liberalization impact estimation purposes, this study added a daily flight. Where flights were already available, the existing frequencies were rounded to the next multiple of seven, to simulate a conservative addition of new flights among countries. The exercise kept the airport and aircraft sizes constant.

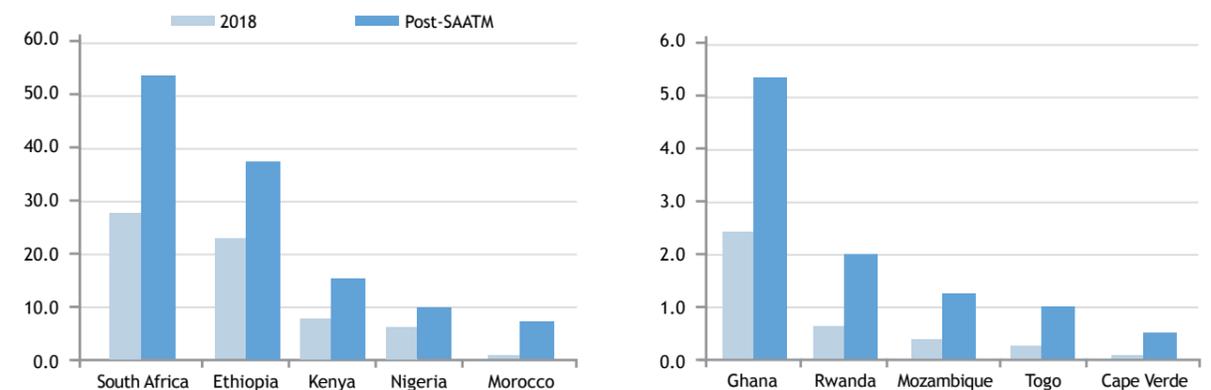
SUMMARY OF FREQUENCY LIBERALIZATION IMPACT EXERCISE:

SAATM Country	Main Airport	Airport size ref. to ATL Weight	Seats per Departure	Destinations		Weekly frequencies		Connection Index	
				2018	SAATM	2018	SAATM	2018	SAATM
Morocco	CMN	10%	155	3	9	10	63	0.4	8.5
Cape Verde	SID	1%	114	1	9	1	63	0.0	0.4
Ghana	ACC	3%	121	6	9	120	170	2.5	5.4
Togo	LFW	1%	152	4	9	40	84	0.2	1.0
Nigeria	LOS	5%	134	7	9	149	168	6.8	9.9
South Africa	JNB	20%	148	6	9	161	205	28.1	53.7
Mozambique	MPM	1%	89	3	9	97	140	0.3	1.2
Rwanda	KGL	2%	127	4	9	56	98	0.5	2.0
Kenya	NBO	7%	143	6	9	137	168	8.2	15.0
Ethiopia	ADD	12%	217	7	9	126	161	22.8	37.5
Total						897.0	1320.0	69.9	134.5

Sources: Sabre, IATA, Embraer

Significant improvement in the inter-connection among the ten-countries was obtained, increasing the number of weekly frequencies on a total of 47%.

CONNECTION INDEX



Source: Embraer

With regards to the connection index, the growth was 93%, meaning that linking all the ten countries with at least a daily flight would mean almost doubling the connectivity of the region, showing the multiplier effect of the aviation.

DATA SOURCES

ATAG
CIRIUM
IATA
IHS MARKIT
INTERVISTAS
OXFORD ECONOMICS
SABRE
WORLD TRADE ORGANIZATION





CHALLENGE.
CREATE.
OUTPERFORM.

RAUL VILLARON
VICE-PRESIDENT
SALES & MARKETING
raul.villaron@nl.embraer.com

GAD WAVOMBA
SALES DIRECTOR
gad.wavomba@nl.embraer.com

FRANCISCO MORAES
SALES DIRECTOR
francisco.moraes@nl.embraer.com

DANIELE SANSONE
MARKETING MANAGER
daniele.sansone@nl.embraer.com

EmbraerCommercialAviation.com

embraer.com

