

North America and West Europe have been the only major markets for regional jets. Analysis shows RJs are only operated in the face of competition and countries with strong economies. Investigating regional airlines around the globe reveals prospects for RJ sales may be poor.

Where are the new & developing markets for Regional Jets?

The US and Western Europe have proven to be successful markets for the regional jet (RJ) manufacturers, but sales to the rest of the world have been limited. This article examines the regional airline operations of the world's largest 150 countries to predict new and developing market opportunities.

Barriers to RJs

The biggest barriers to the global operation of RJs are:

- High acquisition costs
- A lack of infrastructure
- A lack of competition
- A need for high performance

The biggest obstacle for many airlines is high acquisition cost, but particularly the lack of aircraft on operating leases. While financing costs are comparatively low, availability in other parts of the world is limited. For example, GECAS is financing Air Canada's, JetBlue's and US Airways' RJs, but is less likely to offer financing or leasing to a small operator in Western Africa, for example. The world's wealthiest nations have provided the core of RJ demand. This is confirmed by comparing GDP and number of RJs per country.

Successful RJ operations in the US and Europe are also the result of developed air transport networks, and where RJs feed mainline networks. Similar opportunities in the rest of the world are limited. The US led the world into deregulation back in 1979, and Western Europe followed. Consequent competition for passengers has driven operators into acquiring RJs.

Smaller West European countries and

the rest of the world still have less competition, and the pressure to acquire RJs is therefore reduced.

North America

Although there are no new operators in the US, fleet growth in existing airlines is set to continue. This is illustrated by the US's share of orders, since 302 of the 325 Canadair RJ orders are for US operators. There is also a flow of used aircraft entering the country. Mesa has taken eight ex-Ansett CRJ200s from Australia and Chautauqua has taken three ex-Axon Airlines ERJ-145s.

Canada has a smaller number of RJs, all with Air Canada and Air Canada Jazz subsidiary. Although Canada might have few RJs in relation to its GDP, the situation will change with Air Canada's plans to add a further 105 RJs as part of its restructuring.

Central America

Mexico's only RJs are the 12 Fokker 100s flown by Mexicana. In recent years two regional operators have grown in size and capability; Aerolitoral with 23 used Saab 340Bs; and Aeromar with 13 ATR42s. Both are strong RJ candidates.

Regional operations are limited among the wealthier nations of Central America, despite the reasonable amount of mainline equipment. Costa Rica's flag carrier LACSA operates a modern fleet of six A320s, but its subsidiary SANSA only operates four Cessna Grand Caravans on domestic services.

Panama's COPA Airlines operates 737s, and the only other significant operator is Aeroperlas, with Cessna Grand Caravans, Twin Otters and Shorts 360s.

El Salvador has one operator, TACA,

with a fleet of A319/A320s.

Modern RJs are beyond the means of the remaining countries in Central America. Guatemala has no flag carrier as such, and the few independent operators that do exist have a mixed collection of older generation or 'Russian' aircraft.

Honduras is similar, with three principal operators. Two of them fly elderly turboprops and Islena Airlines operates three early production ATR42s. Nicaragua's most significant commercial operator, mainline or regional, is La Costena, with two Shorts 360s and four Cessna Grand Caravans.

Caribbean

The Caribbean's wealthiest Island is Puerto Rico, which is a self-governing commonwealth of the US. Regional airline operations are well developed with Executive Airlines being the largest operator with a fleet of ATR42/72 turboprops. The Dominican Republic has no flag carrier, and although there are three independent regional airlines, these are predominantly 19-seater operators with the most common type being the Let 410. Jamaica is far better served with Air Jamaica and its subsidiary Air Jamaica Express flying Twin Otters and Dash 8s on internal flights.

Cuba is the largest and most populated island in the Caribbean, but years of Soviet influence are still apparent in that the three principal commercial operators, Aerocaribbean, Aerogaviota and Cubana, operate mainly Yakovlev Yak-40 jets and Antonov An-24/26 turboprops. These are slowly being replaced by new and used ATR42s. Significantly the largest operator, Aerogaviata, has taken delivery of four ATR42-500s direct from the factory.

Haiti is the poorest nation in the Caribbean which is reflected in the Let 410, Shorts 360 and Dash 7 aircraft flown by its two commercial operators.

South America

South America has always been a difficult market with a history of financial instability. The region's airlines are characterised by a small number of 'flag carriers' operating modern equipment and other independent operators flying older generation aircraft, including Caravelles, DC-9s and older 737s.

Regional operations, with the exception of established operators in Brazil, Columbia and Venezuela, are small independent companies with a few elderly turboprops.

Argentina's financial instability led to severe problems for long term CRJ operator Southern Winds, with the result that the carrier had to re-invent itself as a 737-200 operator. The only current RJ operator is LADE (Lineas Aereas de Estado), a branch of the Argentine Air Force with a fleet including four F.28s. LADE operates services to difficult destinations unserved by regular airlines.

Despite their relative wealth, Chile and Uruguay both lack any sizeable regional operators. The few that do operate one or two 19-seat turboprops

rather than RJs.

Brazil has the most extensive network of regional airlines. Some of these remain Bandeirante operators, but many have moved up into 30- to 50-seat turboprops, with the Brasilia and ATR42 the most common types. RJ operations are restricted to TAM, which is one of the world's largest operators of Fokker 100s and Rio-Sul with a fleet of 15 locally produced ERJ-145s.

Colombia has some operators flying relatively modern equipment. ACES Columbia has a fleet of nine ATR42s, Avianca and its subsidiary SAM have 10 Fokker 50s and Satena has six Dornier 328 turboprops, an ERJ-145 and an F.28.

The fact that this ERJ-145 was actually the third prototype rather than a new production aircraft demonstrates the financial pressures faced by South American airlines. SAM operated a fleet of nine Avro RJ100s for six years, but they were returned to the manufacturer at the end of their lease and not replaced.

Venezuela has several turboprop operators: Avior Express with Beech 1900Ds; LAI with new production ATR42/72s; and Santa Barbara Airlines with used ATR42s.

The remaining nations, Peru, Paraguay, Ecuador and Bolivia, lack structured regional operators and the only RJs in service are a few F.28s.

Western Europe

The core RJ market in Europe has been with the fleets of the wholly-owned regional subsidiaries of the national flag carriers. For example, Air France (Brit Air and Regional) Alitalia Express, BA CitiExpress and Lufthansa Cityline. This market will become one of the major markets for 70- to 100-seat RJS.

A market began to develop among independent operators, but has stalled with large numbers of optioned aircraft not being taken up. Most of the independent operators flew under franchise agreements. Examples are Flybe/Air France and Skyways/SAS. The need for aircraft has disappeared as these partnerships have gone.

There are several European countries that have lower than average numbers of RJs bearing in mind their wealth and population. Of the fifteen European nations, Austria, Belgium, France, Ireland, Portugal, Sweden, Switzerland and the UK have above average wealth. Finland, Germany, the Netherlands and Spain are about average, but Greece, Denmark and Italy are below average.

Norway in particular stands out, since it is the third wealthiest nation yet there is not a single RJ in operation. This is to an extent the result of the large number of high performance airports to be served,

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but Wideroe was rumoured to have selected the ERJ170 before parent company SAS influenced the decision in favour of the Q400 turboprop.

Finland is a good example of how competition can generate opportunities for RJs. Finnair had a virtual monopoly on domestic services until 1998, but then SAS purchased Air Botnia with its fleet of Jetstream 32s. Air Botnia was rapidly expanded to the current fleet of five Avro RJ85s and five Saab 2000s. Air Botnia has just agreed to lease the last four Avro RJs to increase its RJ fleet to nine.

Southern Europe

Greek RJ operations are currently limited to Aegean's six Avro RJ100s. The only other operator was Axon Airlines with three ERJ-145s, but ceased operations. Olympic Airways and subsidiary Olympic Aviation have faced little competition, and replacement for the ATR42/72s is likely to be new generation ATRs or the Q400.

Adria Airways in Slovenia operates five CRJ100/200s, alongside three A320s. Croatia Airlines has three A320s and four A319s, complemented by three ATR42s and one BAE 146.

Turkey has THY and several other airlines, but most are operated in the charter business. Turkish Airlines has 11 Avro RJs, but there are no other regional aircraft in the country. THY now faces direct competition on domestic routes, which has become a major issue with several new operators planning to commence services.

Macedonia only has Macedonian Airlines, which has two 737-300s. Bosnia-Albanian Airlines has introduced two BAE 146s, while JAT Airways in

Serbia and Montenegro has three ATR72s and Montenegro Airlines three Fokker 100s.

CIS

Aeroflot used to operate a large fleet of Tu-134 and Yak-40 RJs, and these same aircraft remain the only RJs available.

The CIS, and Russia in particular, has large potential, but progress on a Russian RJ is slow and any short-term demand will have to be met from the West.

Although the number of Western aircraft entering the CIS continues to grow, the emphasis is on larger aircraft flying international operations to generate hard currency, rather than concentrating on domestic aircraft which generate revenues in Roubles.

The only western 'regional' aircraft that have been added were two Dash 8-300s to SAT Airlines. In contrast, 94 Russian operators have 224 Yak-40s and 243 Tu-134s. Russia undoubtedly has large potential as a replacement market, but it is unlikely that many operators could afford to replace their existing equipment with new Western aircraft.

Western equipment is being introduced in remaining CIS countries, but it is generally older generation types. Turkmenistan and Uzbekistan are the exception. Turkmenistan Airlines has 35 aircraft, and 15 are western (four 757s, three 737-300s, three 717s, a Hawker 1000 and four helicopters) and 14 were delivered new.

Uzbekistan Airways has three Avro RJ85s (the only Western regional jet operator in the CIS), three 757s, two 767s and three A310s, all delivered new from the factory.

Regional jets are often operated by carriers which face competition. Olympic Aviation, for example, is expected to order new generation ATRs of Q400s to replace its ATR72s.

Eastern Europe

CSA Czech Airlines operates an all-western fleet, comprising three A310s, 11 737-400s and 12 737-500s. The airline placed an order for eight Fairchild 728s, but with the collapse of this programme, CSA has decided to re-evaluate its need for a fleet of smaller-capacity aircraft. This again highlights the barrier that RJs have to overcome in a country where there is a lack of competition. If a domestic competitor were to appear then CSA would face more pressure to replace its ATR42/72s with RJs.

Hungary's flag carrier, Malev Hungarian Airlines, is another monopoly operator and was the first East European RJ operator when it introduced six Fokker 70s. These have been complemented by four Canadair CRJ200s in a new subsidiary, Malev Express. Slovakia, has been far slower to throw off its Eastern connections. Flag carrier Slovak Airlines operates three Tupolev 154s and one 737-300. The only regional operator is independent SkyEurope Airlines with a small fleet of Embraer Brasilias.

Poland's LOT has one of the largest fleets of RJs outside North America and Western Europe, with 14 ERJ-145s in service and 10 ERJ-170s on order. This is due to the fact that LOT and its regional subsidiary EuroLOT are the only sizeable commercial operators in the largest country in Eastern Europe. This monopoly has supported RJ operations as route development aircraft, but the imminent replacement of the 50-seat ERJ-145s with larger ERJ-170s suggests that traffic has outgrown the capacity of the smaller aircraft. This could suggest a move to even larger aircraft.

The Baltic states of Estonia, Latvia and Lithuania all have links with their neighbours, Denmark, Finland and Sweden. The result sees RJs in service at Air Baltic of Latvia and Saab 2000s at Lithuanian Airlines. Estonian Airlines has long discussed the possibility of taking CRJs from its part-owner Maersk.

Romania's flag carrier TAROM has six new-build ATR42-500s and a fleet of A310s and 737s. Independent operator Carpatair has grown since 1998 from a single Yak-40 to add five Saab 340Bs and a Saab 2000.

Bulgaria is the poorest of the Eastern European nations and although it has a number of operators, particularly for

Few airlines in the Asia Pacific operate regional aircraft, and those which do have mainly turboprops. These are used to fly to remote regions, otherwise large aircraft look to remain the norm.

charter business, they retain 'Russian' equipment almost exclusively. The only exceptions are Bulgaria Air with two 737-300s and Viaggio Airlines with a single ATR42.

Africa

The poverty of African nations limits their potential for acquiring RJs. The most prosperous nation, South Africa, accounts for all sales of 30- to 50-seat RJs to the region, although Air Botswana operates one BAE 146-100.

The wealthiest African nations are in the North (Libya, Tunisia, Algeria, Morocco and Egypt) or in the South (Botswana, Namibia, Lesotho and Zimbabwe).

Libyan Arab Airlines has a long-standing requirement to upgrade its fleet after the lifting of US sanctions, and this should allow replacement of four F.28s.

Morocco has experienced a false start in RJ operations. Regional Air Lines ordered five ERJ-135s, but the order is now believed to have been reduced to the status of an option or cancelled. Egyptair has been evaluating a fleet of five to 10 RJs for domestic operations.

Equatorial Guinea is significant, since flag carrier Ecuato Guineana de Aviacion purchased an ERJ-145 from Luxair.

Middle East

Airlines in the Middle East are characterised by being monopoly suppliers, flying larger equipment and with few if any regional aircraft in operation.

Abu Dhabi Aviation's pair of Dash 8s are the only regional aircraft in the United Arab Emirates.

Saudi Arabia has many executive and VIP operators, but commercial operations are restricted to Saudi Arabian Airlines, whose smallest aircraft is the MD-90, and Saudi Aramco which has three Dash 8s and two Twin Otters.

Oman's Oman Aviation Services is growing with four ATR42-500s and six new generation 737s.

Iran has the most developed air transport network of the Arab states, and has a number of regional operators and a mixture of modern western aircraft and older 'Russian' equipment. Iran Air has five Fokker 100s and Iran Aseman has



eight ATR72s. Most of the ATRs were delivered from the factory, and six F.28s with Fokker 100s are believed to be on order to replace them. The Fokker 50 is popular with small operators.

Royal Jordanian Airlines' subsidiary Royal Wings has three Dash 8s. Yemenia is Yemen's sole operator and has Dash 7s and Twin Otters.

Israel has Arkia Israeli Airlines with four ATR72s and four Dash 7s, and Israir has four ATR42s.

Indian sub-continent

Air Lanka does not operate regional aircraft.

India's sole RJ operator is Air Sahara, which has taken delivery of seven Canadair RJs formerly in service with Flybe and Midway.

Regional airlines have a chequered history in India, but one independent carrier which has survived is Jet Airways. This airline has eight ATR72-500s. Jet Airways selected the ERJ-175 as an eventual replacement for the ATR72s, but a firm commitment has still to be made.

Pakistan International Airlines' recent decision to replace its F.27s highlights the problems facing the world's poorer carriers. The airline took delivery of 13 F.27s between 1961 and 1967, but 10 were subsequently lost in service. These losses were replaced with acquisitions from the used market. The current fleet includes 11 aircraft, the youngest of which was built 35 years ago.

Bangladesh has independent Dash 8 operator GMG Airlines. Biman has been a long-term operator of the F.28, and acquired two in 1999. Although it would like to operate new RJs, financial limitations are likely to see F.28s in its

service for several years.

Nepal's flag carrier Royal Nepal Airlines is faced with competition from nine domestic operators, all operating 19-seat aircraft, Twin Otters, Dornier 228s and Beech 1900s.

The only airline in Bhutan is Druk-Air, and operates two BAE 146-100s but their replacements are two A319s.

Asia Pacific

The wealthiest nation outside West Europe and the US without a large-scale RJ operation is Japan.

The previous 70- to 100-seat generations from BAE and Fokker completely failed to penetrate the Japanese market. Bombardier has had limited success in placing CRJs. The Q400 has been selected by both All Nippon Airways and Japan Airlines.

Other wealthy nations in Asia Pacific, Hong Kong, South Korea and Taiwan have small RJ operations. Only Hong Kong has ordered 50-seat RJs, with delivery of the first to CR Airways in July.

South Korea has a well developed air transport system, but no regional operators. Korean's remaining Fokker 100s will be replaced with 737s.

Taiwan only has two Fokker 100s with Mandarin Airlines, although there are a number of regional operators flying modern turboprops.

Singapore does not have regional carriers, and Malaysia Airlines has 10 Fokker 50s and five Twin Otters, while independent Berjaya Air has four Dash 7s. The Fokker fleet was purchased new and its replacement is often reported. Given the high cycle nature of much of the flying, a split order for turboprops and regional jets is a possibility.



Thailand has the most developed regional airline infrastructure with Thai Airways International operating a pair of ATR72s, Bangkok Air with nine ATR72s, PB Air with two ERJ-145s and finally Air Andaman with two Fokker 50s.

Vietnam Airlines is Vietnam's only passenger carrier and has a modern regional fleet of two Fokker 70s and eight ATR72s. ATR's influence is also apparent in Laos. Sole airline Lao Aviation has two ATR72s, two Chinese built Y-7s and five Y-12 turboprops.

Cambodia's regional airlines, with the exception of one ATR72 flown in co-operation with Bangkok Air of Thailand, flies An-24s and Chinese Y-7s.

Myanmar has four commercial operators, including Myanma Airways. This airline would be a perfect candidate for new 70-seat RJs, given that its current fleet includes four F.28s, but it has only been able to acquire F.27s from Cubanair, which were more than 30 years old.

More modern aircraft in the form of ATRs are in service with Air Mandalay and Yangon Airways.

China

China stands out as having huge potential, with six RJ operators: Hainan Airlines has 19 Fairchild Dornier 328Jets; China Northwest has 10 BAE 146s; China Yunnan has eight CRJ200s; Shandong Airlines has 10 CRJ200s and one CRJ700 of two on order; Shanghai Airlines has three CRJ200s; and Sichuan Airlines has five Embraer ERJ-145s.

A further seven Canadair Challenger 800 variants of the CRJ are in service with China United. The sheer scale of China's market potential has not been lost on Bombardier or Embraer, and both

companies have signed agreements for local co-production of their aircraft.

Australasia

Despite Australia and New Zealand's relative wealth, RJ operations are quite limited. Neither country has a 50-seat RJ operator. Although both countries acquired large fleets of BAE 146s, the demise of Ansett has left the Qantas' Airlink operation, flown by National Jet Systems and the three Fokker 100s of Alliance Airlines, as the only RJs in operation. With less competition following the collapse of Ansett and the virtual take-over of Air New Zealand, there is little immediate prospect of smaller RJs re-entering the Australian market. Even Qantas' long awaited BAE 146 replacement may be overtaken if it decides to concentrate on its 717 fleet.

Indonesia is still a large potential market, given that it was the biggest F.28 customer, and 19 remain in service with six operators.

The F.28 is also important to Papua New Guinea and flag carrier Air Niugini. Air Niugini is only allowed to continue operating these aircraft until April 2004. They will then have to be replaced.

Summary

Today's US and European RJ operators are mature businesses that began operations with general aviation aircraft, then developed through 19-seaters, to 30-50 seat turboprops and then into RJs. Few made a direct transition from 19-seat turboprops to RJs. Since many parts of the world still only have operators that are little beyond the 19-seater stage it is unrealistic to

Central & South America offer little prospect of RJ sales, since most jet airlines have a history of financial weakness and regional airlines show even smaller prospects for growth.

expect them to acquire RJs.

North America is expected to remain the largest source of demand for RJs in the 50-seat category, and with a gradual erosion of scope clauses will extend upwards to the 70- to 100-seat category.

Central America has few likely candidates for new RJs, with the exception of operators in Mexico.

Caribbean airlines tend to be limited by their need to access smaller island airfields. One potential is Cuba. Large numbers of Russian built aircraft need replacement and since ATR has managed to place aircraft there it is not inconceivable that RJs will follow.

South America has a history of financial instability and a practical need for high performance. With a return to stability, Brazil's desire to support Embraer, and the needs of the larger countries with established regional operators (Argentina, Brazil, Colombia and Venezuela), could generate demand for its high performance ERJ-170. Bombardier may find it difficult to compete there against the local politics and high performance requirements.

There are still a number of untapped markets in Western Europe. Southern Europe's airlines will probably be customers for the previous generation of 70- to 100-seat RJs.

The large potential of the CIS is unlikely to be fulfilled in the short term.

East Europe is an improving market as other nations follow Poland's RJ lead. The only obstacle is the monopolistic nature of the airlines.

Africa may see an expansion of the RJ fleet in Libya, Algeria, Morocco and Egypt.

There are little or no prospects in the Middle East.

Asia is characterised by huge population centres and large aircraft are the norm.

The biggest potential is China. With an existing customer base and the prospect of local production, prospects for the ERJ-145 and CRJ700 look good.

The Asia Pacific's more wealthy nations, Malaysia, Thailand and Vietnam, all provide a steady market for new aircraft.

Australasia's wealthiest nations appear to have little appetite for RJs, while Indonesia and Papua New Guinea lack the wealth. **AC**