

The Future of Barcelona Airport: An Economic View

The decision by the Spanish Council of Ministers on 28 September 2021 to approve a 2022-2026 Airport Regulation Document (DORA) that does not envisage the expansion of Barcelona airport may seem to close the debate on whether or not such an expansion is necessary. However, because this decision does not solve the problem indefinitely, it can also be interpreted as an opportunity to take more time to delve into the debate and rigorously analyse the various alternatives.

This paper aims to contribute to the debate by exploring some of the economic implications of the two main scenarios under consideration: maintaining the airport's current infrastructure or, alternatively, increasing its capacity in accordance with the proposal put forth by AENA.

Any analysis of the necessary capacities must be based on a forecast of growth in demand. Air passenger traffic¹ has grown significantly in recent years, with cumulative annual growth rates reaching 6.1% globally for the period 2010-2019 and rising to 7.4% if only international traffic is taken into account. In the case of Barcelona,² passenger traffic during the same period—that is, the period following the airport's most recent expansion—increased from 29.2 to 52.7 million passengers per year, representing a cumulative annual increase of 6.8%.

Clearly, the COVID-19 pandemic has drastically reduced mobility. Some forecasts³ suggest that air traffic will be back to 2019 levels by 2024. Whatever the accuracy of these estimates, the key question is whether, once the effects of the pandemic have receded, demand for air transport will continue to grow at the same pace as before. Given that the explanatory factors underlying past trends—improved standards of living, economic integration, income-elastic demand—are likely to continue to play a role in the future, we might expect to see similar rates of growth.

However, there are certain factors at play that could lead to more moderate growth in demand for air transport in the future. First, during the pandemic, experiences with remote meetings of all sorts showed that this technology can act as a substitute—albeit an imperfect one—for face-to-face meetings. These digital contacts do not completely eliminate the need for air travel, but they can act as alternatives to some journeys. Second, when, at some point in the near future, air transport is subject to the full internalisation of the environmental costs it generates, we can expect to see an increase in airfares, which in turn will reduce demand. The timetable for the imple-

The decision must be made after analysing the costs and benefits of all the alternatives, without ruling out any of them a priori.

mentation of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSA), developed by the International Civil Aviation Organisation (ICAO), is less demanding than that of the Emissions Trading System (ETS), which already applies to flights within the European Union, but the pressure to mitigate the consequences of climate change is expected to accelerate the rollout of the scheme. The third factor that could tamp down future demand for air transport is the development of rail travel—especially high-speed trains (HSTs)—as a substitute for flying. For journeys of up to 600-700 km, HSTs are a clear alternative to air travel. However, when considering the impact that the future development of rail travel could have on Barcelona specifically, we must note that the city is already linked to the most important markets within this radius. Only the improvement of connections along the Mediterranean coast and the construction of a line connecting Barcelona to the Bay of Biscay would have a significant effect on the demand for air transport to and from Barcelona. Finally, a fourth factor that could reduce the demand for air travel is the change in user preferences encompassed under the Swedish term *flygskam*, which is typically translated as “flight shame”. However, this change in preferences does not appear to be of significant magnitude; in any case, much of its justification will be lost once air transport internalises its environmental costs.

For all these reasons, we believe that, although demand for air transport may increase more slowly than in the decade prior to the pandemic, it will not decrease, since the factors accounting for the sharp increase in mobility will continue to drive it. Thus, although we cannot predict exactly when, we believe that at some point Barcelona airport will once again face a situation of congestion, with demand reaching or exceeding its maximum capacity of 55 million passengers per year. Given this background, the rest of this paper will analyse the various issues that arise in each of the two possible scenarios: expansion and no expansion.

a) No expansion

In this scenario, in which Barcelona airport would continue to operate with its current infrastructure, the main problem that arises is that of congestion. The immediate consequences of operating an airport at or above full capacity are more frequent delays and cancellations. In fact, even before the

¹ Data from the International Energy Agency: <https://www.iea.org/data-and-statistics/charts/world-air-passenger-traffic-evolution-1980-2020>

² AENA. Air traffic statistics: <https://www.wssl.aena.es/csee/Satellite?pagename=Estadisticas/Home>

³ J. Bouwer, S. Saxon and N. Wittkamp, Back to the future? Airline sector poised for change post-COVID-19, McKinsey & Company, April 2021. Available at: <https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/back-to-the-future-airline-sector-poised-for-change-post-covid-19>

Once the impact of COVID-19 has receded, demand for air transport will continue to grow.

pandemic, when the use of the airport did not exceed its maximum theoretical capacity, Barcelona was already among the most delayed airports in Europe.⁴ Another consequence of operating at full capacity is an increase in prices, with airlines finding it difficult to operate new routes and thus to compete in different markets.

In a situation of excess demand at a particular airport, it is common for part of the demand to shift to alternative airports. This decision, logically, falls primarily to the airlines, as they are the ones who decide whether or not to offer connections from nearby airports not affected by congestion problems. In the case of Barcelona, the alternative airports are Reus (REU) and Girona-Costa Brava (GRO). In 2019, these airports were used by just 1 million and 1.9 million passengers, respectively—well below their capacity.

A good example of the development of a secondary airport in a large European metropolitan area is Bergamo-Orio al Serio (BGY), located approximately one hour by motorway from central Milan. Demand at this airport has grown from just over 1 million passengers in 2002 to 13.8 million in 2019, accounting for 30% of all traffic at the three airports serving the city: Malpensa (MXP) serves 25 million passengers per year and Linate (LIN) 6 million.

One of the factors that makes an airport more attractive for route development is the fees that it charges the airlines. We calculated the fees for the operation of an Airbus A320 and found that Bergamo is 35% cheaper than Malpensa. Similarly, Girona-Costa Brava airport has a 44% fare advantage over Barcelona for the same type of aircraft. Therefore, fares cannot be the only factor explaining Bergamo's success compared to Girona-Costa Brava or Reus. One key differential factor is the fact that the company that operates Bergamo airport (SACBO) is not the same one that manages Malpensa and Linate (SEA), whereas in Spain, AENA manages all of the airports. Competition between operators undoubtedly encourages the development of specialisation strategies that could be very successful in attracting certain airlines.

A key question in this scenario is whether the expansion of demand from Barcelona to secondary airports should be distributed between Reus and Girona-Costa Brava or whether, on the contrary, it might make sense to concentrate this demand in just one of these two airports. Beyond the regional implications of this decision, it should be noted that the estimation of long-run cost functions of Spanish airports demonstrates the existence of economies of scale, which are especially intense at lower capacity levels (Martín et al., 2011).

One variant of the “no expansion” scenario is the reconfiguration of the runways at Barcelona airport. When runway 07R-25L was built, the initial plan was for this runway to be used for landings, while the longer, inner parallel runway 07L-25R was to be used for take-offs. However, due to the acoustic impact of take-offs on population centres to the south, the airport was reconfigured in October 2006 so that aircraft land on the long runway and take off from the short one, turning towards the sea to avoid flying over populated areas. This operational configuration gives rise to

additional capacity restrictions when large aircraft—which are commonly used for intercontinental flights—need to take off from the long runway, as this requires spacing out the landings taking place on said runway.

Therefore, the variant scenario would entail returning the airport to its original configuration, with the aforementioned acoustic consequences. Although technological improvements in the aircraft engine manufacturing industry have reduced noise impacts, it is not expected that these impacts will disappear altogether within a reasonable period of time (Kousoulidou and Lonza, 2016).

b) Expansion

This scenario envisages the proposal put forth by AENA, which basically entails lengthening runway 07R-25L by 500 metres and building a satellite terminal to T1. This proposal would increase the airport's capacity to 72 million passengers per year, with 90 landing or take-off operations per hour (compared to the current 78).⁵

With this proposal, AENA signalled its desire to transform Barcelona airport into a hub— as in the “hub and spoke” operational system used by airlines. In this system, the operations of an airline are concentrated at a particular airport—the “hub”—where passengers transfer to other flights to complete their journey. For an airport, serving as a hub involves significantly higher volumes of traffic than it would have if it were to operate solely on the basis of its local market. This means having a greater number of flight connections, which increases the city's attractiveness as a location for companies that value such connectivity, as demonstrated by Bel and Fageda (2008).

In Europe, the main airports serving as intercontinental hubs are Frankfurt (FRA), London-Heathrow (LHR), Amsterdam-Schiphol (AMS) and Paris-Charles de Gaulle (CDG), which are sometimes referred to collectively by the acronym FLAP. In 2019, traffic at these airports ranged from 70 million passengers at Frankfurt to 80 million at Heathrow. With the expansion proposed by AENA, Barcelona airport would reach a capacity level equivalent to that of these hubs.

However, having the capacity does not automatically make an airport a hub, since it is the airlines that perform this function by organising their operations using the airport as a base. In fact, at each of the airports mentioned above, there is one airline that accounts for at least half of the airport's capacity. British Airways has a 52% share at Heathrow, Air France 49% at Charles de Gaulle, KLM 65% at Schiphol and Lufthansa 65% at Frankfurt. Without an airline to play this role, an expanded Barcelona airport would not be able to assume hub functions.

⁵ <https://www.aena.es/en/josep-tarradellas-barcelona-el-prat/get-to-know-us/hub-development/introduction.html>

⁴ <https://www.eurocontrol.int/sites/default/files/2020-04/eurocontrol-coda-digest-annual-report-2019.pdf>

Even if the airport is expanded, it cannot become an intercontinental hub if it does not attract a major airline.

The alternative to being a hub would be to develop intercontinental connections from Barcelona operated by different airlines. This option would not generate the additional traffic of a hub, since the flight schedules of the different airlines would not be coordinated, making it difficult for passengers to make efficient flight connections. However, this scenario would make it feasible to achieve the objective of increasing Barcelona's connectivity, as it would eliminate the problem of the capacity restrictions associated with the operation of large aircraft.

In fact, this is the strategy that has been pursued since 2005 by the Air Routes Development Committee (CDRA), made up of the Catalan Government, the Barcelona City Council, the Chamber of Commerce and AENA. The number of intercontinental connections from Barcelona has increased significantly in recent years, reaching 14 destinations in Asia and 21 in the Americas during the summer of 2019. As a result, intercontinental traffic in Barcelona has increased from less than 1 million passengers in 2006 to more than 5 million passengers in 2019.

However, despite the results achieved to date and the opportunities that an expanded airport could seize to continue to advance this strategy, the gap between Barcelona and other major European airports in terms of intercontinental demand remains quite large. As shown in Table 1, the FLAP hubs serve around 20-40 million intercontinental passengers per year. Even Munich, which is similar to Barcelona in terms of overall demand, serves 70% more long-haul passengers. The risk associated with carrying out an expansion that would increase demand by 20 million passengers is that this traffic increase would be concentrated precisely in the segments in which Barcelona airport specialises—in other words, short-haul flights.

Conclusions

This paper reviews the main economic implications of the different scenarios under consideration with regard to the expansion of Barcelona airport. The main conclusion of our analysis is that the decision, which will have to be made at some point in the future, must be based on analyses that comprehensively assess the costs and benefits of all the alternatives, without ruling out any of them a priori. Assessment methods (not to be confused with impact analyses) have evolved considerably in recent years, allowing conclusions to be reached on the basis of rigorous and explicit quantification of the economic and environmental impacts.

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Table 1. Passengers by origin or destination, 2019 (millions)

Airport	Domestic	Europe	The Americas	Asia	Africa	África	Total intercontinental
BCN	13.9	29.9	1.9	1.6	0.6	1.0	5.1
LHR	4.8	32.2	19.2	17.8	1.0	3.6	41.6
FRA	7.3	35.9	9.6	10.1	1.1	2.8	23.6
CDG	6.5	34.0	12.0	11.0	1.9	6.6	31.5
AMS	-	48.9	8.8	6.8	1.5	2.3	19.4
MAD	16.6	27.0	6.3	1.9	4.6	1.2	14.0
MUC	9.5	27.2	3.5	4.5	0.1	0.6	8.7

Source: compiled by the authors using data from Eurostat ([avia_pa](https://ec.europa.eu/eurostat/web/transport/data/database)) <https://ec.europa.eu/eurostat/web/transport/data/database>