

Analysis of the production of civil aircrafts in 2017

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Abstract:

The market environment of the transport sector is characterized by marked turbulence and rapid developments, particularly in recent years. Even though air transport is the youngest sector of the transport industry, it has experienced an expansion during its formation, which is very rare. In particular, the speed of air traffic has caused an increase in passengers using this sector. The growth of the passengers is also closely linked to the development of the market for the production of technical equipment used in air transport. Aircraft manufacturers must flexibly adapt to the turbulent development of the industry and continually overcome technological requirements. The largest civil aircraft manufacturers today include Airbus and Boeing. Their competitive fight is the reason for the optimal and constant supply of the air transport market with more modern, faster and better transport aircraft.

Kľúčové slová:

air transport, civil aircraft, Airbus, Boeing, the market

INTRODUCTION

The largest expansion of air transport has occurred in recent decades. The number of passengers is growing dramatically, and till now it is more than 3.7 trillion. Huge development of air transport and air transport market was caused by the enormous increase in the number of passengers in the past ten years, where the number of air travellers has grown by more than one billion passengers.

Number of projections and forecasts agree that this trend will continue and the number of passengers will grow exponentially in the future.

The increase in the number of passengers also effects expansion of air transport market and concern all stakeholders. Summary information about the expansion of the aviation market are shown in Figure 1.

The market value is currently \$6.1 trillion, which corresponds to 41 030 deliveries of the aircrafts from all manufacturers.

In the year 2017 we have seen an increase in traffic of 4.7%, while the number of airline flights this year was increased by 3.5% compared to the previous period.

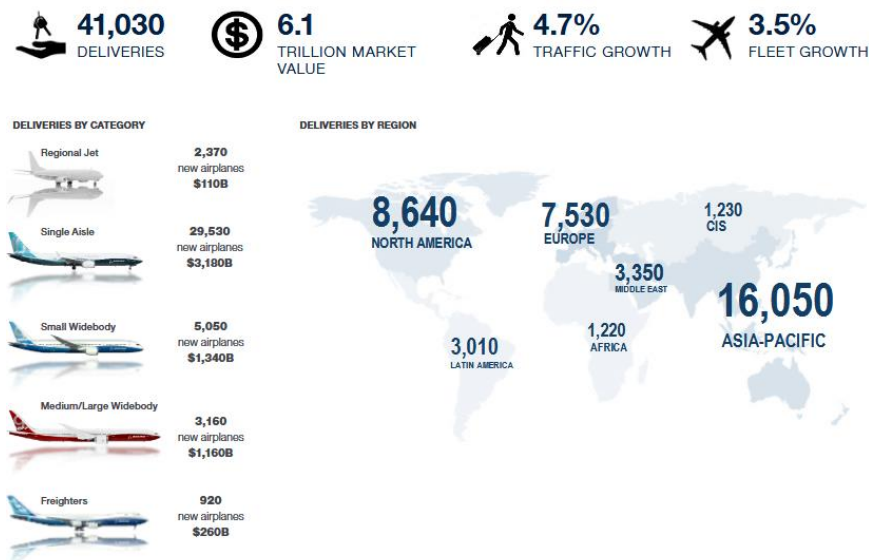


Fig.1 The market situation of air transport in the year 2017

Source: [2]

In the area of civil aviation and the production of transport aircraft, two manufacturers, Airbus and Boeing, dominate today. In addition to these companies, Embraer and Bombardier aircraft are currently in service. The categorization of civil aircraft in service is shown in Table 1.

Table 1 Airplane market sector definitions.

COINCIDING WITH THE SINGLE PASSENGER AIRPLANES	WIDEBODY PASSENGER AIRPLANES	
Single Coinciding with the	Medium/Large	Small
Boeing 757 Boeing 717 Boeing 737-300 through -600 The Boeing 737-700,-CZK 800.0-900ER Boeing 737-MAX8 MAX9 MAX10 MAX7,, Airbus A318 , A319, A320, A321 Airbus A319neo, A320neo, A321neo Boeing/MDC The MD-80, a-95 Embraer EMBRAER ERJ 135, ERJ140, ERJ145 Embraer E170, E190, E175, E195 Embraer E175-E195 E2, E2, E2-E190- Bombardier CRJ 700, 900, 1000 Bombardier CS100, 300	Boeing 747-8 Boeing 747-400 Airbus A380 The Boeing 777, 777x Boeing 787-10 Boeing/MDC MD-11 Airbus A340 Airbus A350-1000	The Boeing 767, 787-8,-9 Boeing/MDC DC-10 Airbus A300, A310 Airbus A330 Airbus A350-900

* **Bold:** airplanes in production or launched

Source: custom processing

Based on these facts, our analysis is focused on Airbus and Boeing, which are the world's largest competitors in the production of medium and long-distance civil airplanes. Both companies focus their production on different categories of aircraft, which are then tailored to customer requirements. However, they create individual classes that compete directly with technical parameters and capacities. Their competition is part of the global expansion of the aviation market.

1. MANUFACTURERS OF CIVIL TRANSPORT AIRCRAFT FOR LONG AND MEDIUM DISTANCES

Airbus and Boeing, with their production program, cover a whole range of narrow-band and wide-body civil airplanes. Both companies have undergone turbulent developments throughout their history and have had to overcome several crisis periods. Despite the turbulent developments in the aviation industry, they have been able to adapt relatively quickly to market requirements and have become the only global players in the production of medium and long-distance civilian airplanes.

1.1 Airbus

Airbus S.A.S, known as Airbus, is based in Toulouse, France. The owner of the company is EADS (The European Aeronautical Defense and Space Company). The final assembly of civilian aircraft is carried out in Toulouse, Hamburg and China in Tianjin. There are also engineering, sales and support centers in North America, sales centers, and customer support centers in Japan and China. Airbus has an engineering center in Russia. Throughout the world, Airbus has five replacement centers and three fully-developed training centers in Toulouse, Miami and Beijing. During its historical development, Airbus produced several types of aircraft with different parameters. An overview of each aircraft type is shown in Table 2.

Airbus, by producing civilian airplanes in the form of class categorization, covers a wide range of potential customers. The very large segmentation of aircraft produced is the reason for the rapid growth of this company. In total, this company supplied till January 2017 more than 10,450 civilian airplanes, recording 17,155 orders. Overall, the company records 420 customers operating their aircraft. The largest percentage of supplies and orders for civilian airliners are registered in Asia and the Pacific, where almost a quarter of Airbus customers operate (see Figure

3). Almost a third of the company's customers come from Europe, about one-sixth of North American customers. About ten percent of customers are from Latin America, the Caribbean and the Middle East. The smallest customers come from Africa.

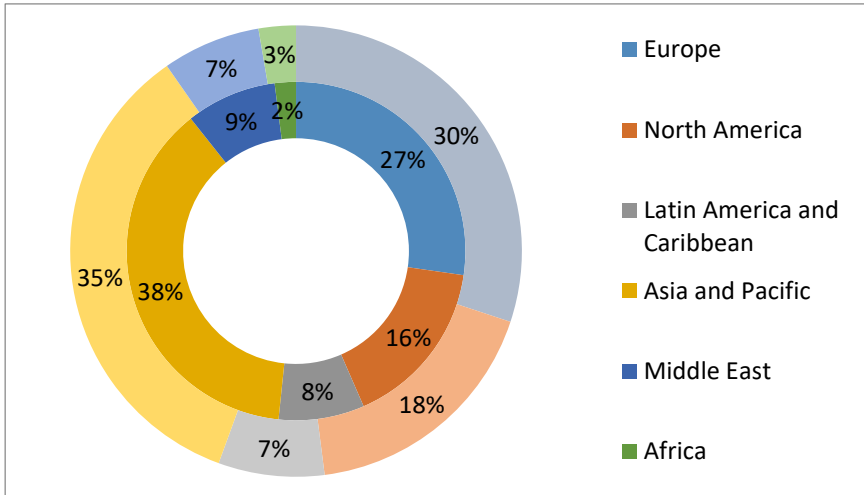
Table 2 Overview of civil transport aircraft manufactured by the company Airbus.

Type of the aircraft	Description	The number of seats	Start of development	The first flight	The first delivery
Airbus A300	2 engines, 2 aisles	266-298	1969	1972	1974
Airbus A310	2 engines, 2 aisles	240-247	1978	1982	1985
Airbus A318	2 engines, 1 aisle	107-132	1999	2002	2003
Airbus A319	2 engines, 1 aisle	124-154	1993	1995	1996
Airbus A320	2 engines, 1 aisle	150-180	1984	1987	1988
Airbus A321	2 engines, 1 aisle	185-236	1989	1993	1994
Airbus A330	2 engines, 2 aisles	253-335	1987	1992	1993
Airbus A340	4 engines, 2 aisles	261-419	1987	1991	1993
Airbus A350	2 engines, 2 aisles	250-440	2004	2013	2015
Airbus A380	4 engines, 2 aisles, 2 decks	525	2000	2005	2007

Source: custom processing
Source: [1]

The number of civil transport aircraft delivered grew by an average of 8% on a year-on-year basis. The biggest increase on the part of customers is the A319 320/321 aircraft, which saw a significant increase in the number of pieces

produced from the number of 4 181 delivered aircraft in 2010 to 7 442 aircraft delivered in 2017 between 2010 and 2017.



* **Dark color:** orders; **light color:** deliveries

Fig.2 Geographic region Summary of Airbus through May 2017

Source: custom processing

Customers show an intense interest including A330 / 340/350, of which 1,042 aircrafts were produced in 2010, and in 2017 to 1,768 units. Customers are also interested in A380 aircraft, where by May 2017 the company has supplied up to 207 units of this type, while in 2010 it was only 26 units. This fact is evidence that the airline market is constantly growing, and Airbus is forced to respond promptly to the changes and demands of this market. The fact that the company's responses to market change are effective is seen mainly in the increase in the number of orders but also in the deliveries of individual classes of civil aircraft.

1.2 Boeing

Boeing is an American multinational airline and also the world's largest manufacturer of commercial and military aircraft. It controls more than half of the jet aircraft market and has a significant market share in military jets and

helicopters, rocket systems and space technology. At present, Boeing is divided into two business divisions. Boeing Commercial Airplanes and Boeing Defense, Space & Security. Boeing has its customers in 145 countries and employs people in more than 60 countries around the world. From the "Big Four" formed by Boeing, Douglas, McDonnell and North American, there has been one huge company, The Boeing Company.

The new millennium began for Boeing to move its headquarters from Seattle to Chicago. Airbus gained market power and the September 11, 2001, attack on the airline had a negative impact on the aviation industry.

Crude oil prices have risen and airline carriers have focused their attention on more efficient and economical aircraft. Boeing started working on a completely new aircraft, the Boeing 787 Dreamliner, which became the best-selling aircraft in the pre-production phase. Boeing's fleet characteristics are shown in Table 2.

During its existence, Boeing has gone through various stormy periods. Nevertheless, it still has a significant market position in the air transport market. As of June 2017, the company registered a total of 23,050 orders and delivered 17,306 civilian aircrafts.

Like Airbus, Boeing manufactures its aircraft in classes which, based on technical parameters, are directly competing with Airbus's civil airplane classes. From a historical point of view, customers were most interested in Boeing 737 aircraft. But one of the best-selling aircraft today is Boeing 777 with a total of 1,763 orders and 1,342 deliveries.

Similarly, to Airbus, Boeing's market segmentation is fairly the same, albeit with a different interest in aircraft from customers. The detailed segmentation of geographic market segmentation, taking into account the orders and deliveries of Boeing's civil aircraft by May 2017, is shown in Fig. 5.

Nearly half of the orders and supplies of Boeing's civilian aircraft flew to North America from May 2017. Approximately one quarter of orders and deliveries of civilian airplanes are from Europe and some more than a fifth of orders and deliveries are from Asia Pacific customers.

Less than ten percent of orders and deliveries of civil airplanes are from South and Latin America, Caribbean, Middle East and Africa customers.

Customer interest in Boeing's civilian airliners is also obvious because the number of aircraft sold is increasing every year. The exception was the year 2016, when the company recorded a drop of 14 pieces of delivered aircraft. This drop occurred in the aircraft classes 737, 747 and 767.

The interest in aircraft of Classes 777 and 787 increased. The most significant increase was recorded by aircraft of Class 787, where the total number of aircraft delivered in this class increased from 0 in 2010 to 137 aircraft delivered in 2017.

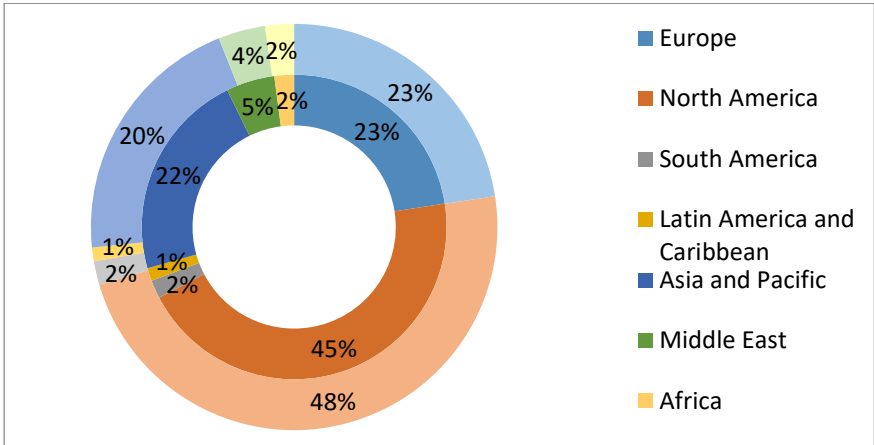
Table 3 Overview of civil transport aircraft manufactured by Boeing Company.

Type of the aircraft	Description	The number of sites	The launch of the development	The first flight	The first delivery
The Boeing 707	4 engines, 1 aisle	124-189	1952	1954	1958
Boeing 717	2 engines, 1 aisle	106-117	1995	1998	1999
The Boeing 727	3 engines, 1 aisle	96-189	1960	1963	1964
The Boeing 737	2 engines, 1 aisle	100-215	1965	1967	1968
The Boeing 747	4 engines, 2 aisles	366-568	1966	1969	1970
The Boeing 757	2 engines, 1 aisle	200-280	1979	1982	1983
The Boeing 767	2 engines, 2 aisles	181-375	1978	1981	1982
The Boeing 777	2 engines, 2 aisles	301-550	1990	1994	1995
The Boeing 787	2 engines, 2 aisles	210-330	2004	2009	2011

Source: custom processing

Even though Boeing had to overcome several crisis periods during its existence, it is a major supplier and manufacturer of civilian aircraft which has a significant presence in the air transport market.

Despite a strong competitor, the company managed to bring innovative and new types of aircraft on the market.



the dark color: orders; light color: deliveries

Fig.3 Geographic region Summary of Boeing through May 2017

Source: custom processing

Table 4 Top 10 most used aircraft from major Airbus and Boeing manufacturers (July 2016).

The manufacturer and the family of aircraft	July 2016	July 2015	Difference
Family Airbus A320	6 510	6 041	7.8%
Boeing 737-600/700/800/900	5 567	5 115	8.8%
The Boeing 777	1 324	1 258	5.2%
Airbus A330	1 154	1 093	5.6%
Boeing 737-200/300/400/500	945	1 006	-6.1%
The Boeing 767	742	762	-2.6%
The Boeing 757	688	737	-6.6%
Boeing 717/MD-80/MD-90/DC-9	655	668	-1.9%
The Boeing 747	515	558	-7.7%
The Boeing 787	423	228	46.9%

Source: [7]

2. COMPARISON OF AIRBUS AND BOEING'S PERFORMANCE

At present, despite Boeing's rival combat, more Boeing aircraft than Airbus are operating.

For comparison, in Table 6 we list the ten most used aircraft in service from Airbus and Boeing and compare them between 2015 and 2016. Boeing 787 recorded the largest increase. On the contrary, the Boeing 747 aircraft recorded the largest decline.

The two companies play a major role in the production of civilian airliners, but also on the air transport market. Their competition is strong, but even though they are both successful companies and their performance is increasing from year to year.

Nevertheless, it is necessary, however, to make these companies compared with their development.

CONCLUSION

Both companies currently play an important role in the production of civilian airliners, but also in the air transport market. Their competitive fight is significant, but both companies are successful and their performances are rising year on year. However, it is still necessary for these companies to forecast their development.

Since its inception, Airbus has long lagged behind Boeing in civil aircraft manufacturing. The breakthrough occurred in the wake of the new millennium when Airbus expanded the production of the Airbus A320 family and in 2007 expanded its offer of the large-scale Airbus A380.

For Airbus, better times have taken place, but they did not last long, and in 2012 Boeing once again outpaced it in civil aircraft manufacturing. At that time, Boeing came to market from the new Boeing 787 Dreamliner. Currently, after overcoming the 2008 financial crisis, both Airbus and Boeing have a stable position in the aviation industry and their civil aircraft production is steadily growing.

Despite their competitive fight, the companies analyzed adequately cover the air transport market and supply air carriers with the most modern civil aircraft that are flexible to accommodate market requirements. Both companies have been expanding since their inception, and in the future, it is assumed that their expansion will be as rapid as ever.

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