ANALYSIS: A320neo vs. 737 MAX: Airbus is Leading (Slightly) – Part II

By Vinay Bhaskara February 5, 2016

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The Boeing 737 MAX had its first flight last Friday and the Airbus A320neo has just entered service with Lufthansa. Both halves of the large commercial aircraft duopoly have achieved a critical milestone on their most important product, so we prepared an analysis of the competition between the A320neo and 737 MAX.

In Part I of the analysis, we took a look at the history of the competition between the two aircraft as well as the breakdown of orders and deliveries. In Part II today, we will conduct an in-depth analysis of the operating economics of these aircraft. And Part III will cover the key battlegrounds that will determine how this battle will play out.

Operating Analysis

In order to assess the prospects of the various members of the 737 MAX and A320neo families, we conducted a thorough operating analysis of the six aircraft, comparing not only operating costs, but performance capabilities, and seating configurations (revenue potential). To compare the aircraft, we chose a standard domestic short haul route between Atlanta and Newark as the mission, a 660 nautical mile (nm) flight once headwinds are added.

Block Time and Utilization

The aircraft all have a cruise speed of Mach 0.78 (511 miles per hour), and accordingly the block times for each aircraft is equalized at 101 minutes. Annual utilization for each aircraft was set at 3,600 flight hours, assuming standard utilization for short haul flying within the United States or Europe as a trunk aircraft.

Range

The 737 MAX 7 under Boeing's new "Standard Rules" has a max range of 3,350 nm with passengers plus baggage (pax + bags) whereas we estimate the A319neo's actual (not advertised) range is 3,650 nm with pax + bags, reversing the range advantage of the 787-8 over the A330-200. After applying the standard 15-25% discounting of these figures for factors like fuel reserve, additional payload, and headwinds, you get a still-air operating envelope of 2,500 – 3,100 nm for these two aircraft where both can comfortably operate all of the missions with a full payload.

The 737 MAX 8 has a max range of 3,515 nm with passengers plus baggage (pax + bags) whereas we estimate the A320neo's actual (not advertised) range is 3,300 nm with pax + bags, reversing the range advantage of the A319neo over the 737 MAX 7. After applying the standard 15-25% discounting of these figures for factors like fuel reserve, additional payload, and headwinds, you get a still-air operating envelope of 2,500 – 3,000 nm for these two aircraft where both can comfortably operate all of the missions with a full payload. However, the 737 MAX 8's larger internal fuel capacity allows it to reach 3,700 nautical miles based on internal fuel while the A320neo becomes fuel limited far short of that. Based on this, the 737 MAX 8 could theoretically fly longer haul flights (such as trans-Atlantic for a low cost carrier like Norwegian) that the A320neo cannot.

The 737 MAX 9 also has a max range of 3,515 nm with passengers plus baggage (pax + bags) whereas we estimate the A321neo's actual (not advertised) range is 3,650 nm with pax + bags, once again reversing the range advantage of the 737 MAX 8 over the A320neo. After applying the standard 15-25% discounting of these figures for factors like fuel reserve, additional payload, and headwinds, you get a still-air operating envelope of 2,650 – 3,100 nm for these two aircraft where both can comfortably operate all of the missions with a full

payload. However when the analysis is extended to long haul routes, the A321neo LR expands the A321neo's range advantage whereas the 737 MAX 9 is performance limited from ever achieving its full range potential.

Seating Capacity

For the purposes of this analysis, it is important to make accurate comparisons in terms of real world seat capacities, rather than using the marketing figures offered by Airbus and Boeing. While these figures are not as problematic since Boeing switched to the "Standard Rules," we still built our own seating models for the six aircraft. In order to cut through the marketing "noise" that emanates from both Boeing and Airbus on this topic. We utilized real world examples of seating capacity from airlines that operate both 737NGs and A320ceos such as Delta Air Lines, United Airlines, and China Southern, amongst others. The seating configurations used are three-class with a United States style first class (not a Qatar Airways style regional business class), a premium economy cabin modeled on United Airlines' Economy Plus, and a standard US full service carrier's economy class with 30 inches or more of seat pitch.

Operating Cost Analysis

Our operating cost analysis of the six aircraft can be found in the table below. For all of the aircraft, we tabulated figures for three different prices of jet fuel, $1.00 per gallon (near the current spot price as per IATA's jet fuel monitor), $2.00 per gallon, and $3.00 per gallon. We also calculated both cash operating costs (excluding capital costs) and direct operating costs (inclusive of capital costs), as well as direct operating cost on a seat-mile basis CASM. The seat-mile figures reflect the three class configurations. For the lease rates, we used a figure of 0.85% of the discounted list price of the aircraft.

We also applied discounts to the aircraft from their public list price (to reflect the real world Airbus and Boeing practices). The discounts for the A320neos are higher than those of the 737 MAX because Boeing and Airbus' list prices reflect different aircraft, as Airbus' list prices are for fully loaded aircraft (with completed interiors and the like) whereas Boeing's list prices reflect a more sparse configuration. To provide an apples-to-apples comparison, we reflected this fact in the relative discounts applied to the Airbus and Boeing products (43% for Airbus versus 45% for Boeing).

Aircraft	737 MAX 7	A319neo	737 MAX 8	A320neo	737 MAX 9	A321neo
Seating Capacity	128	124	166	154	180	192
Configuration	12F/20Y+/96Y	12F/20Y+/92Y	16F/54Y+/96Y	16F/42Y+/96Y	20F/30Y+/130Y	20F/30Y+/142Y
Mission Length ESAD (nm)	660	660	660	660	660	660
Block Time (Min)	101	101	101	101	101	101
Block Time (Hrs)	1.68	1.68	1.68	1.68	1.68	1.68
Fuel Burn (Gallons)	1147	1128	1222	1117	1327	1358
(%)	101.7%	100.0%	109.4%	100.0%	97.7%	100.0%
Trip Fuel Costs ($1.00)	1147	1128	1222	1117	1327	1358
Trip Fuel Costs ($2.00)	2294	2256	2444	2234	2654	2716
Trip Fuel Costs ($3.00)	3441	3384	3666	3351	3981	4074
Flight Crew Cost	1550	1550	1630	1630	1712	1712
Maintenance Cost	1363	1453	1478	1532	1459	1601
Navigation Cost	795	830	904	869	971	1028
Cash Operating Cost ($1.00)	4855	4961	5234	5,148	5469	5699
(%)	100.0%	102.2%	101.7%	100.0%	100.0%	104.2%
Cash Operating Cost ($2.00)	6002	6089	6456	6,265	6796	7057
(%)	100.0%	101.4%	103.1%	100.0%	100.0%	103.8%
Cash Operating Cost ($3.00)	7149	7217	7678	7,382	8123	8415
(%)	100.0%	101.0%	104.0%	100.0%	100.0%	103.6%
List Price ($ millions)	92.7	98.5	113.1	107.3	119.9	125.7
Discounted List Price ($ millions)	52.8	54.2	64.5	59.0	68.3	69.1
Monthly Lease Rates ($)	449,132	460,488	547,970	501,628	580,916	587,648
Monthly Utilization (hrs.)	300	300	300	300	300	300
Mission Capital Cost	2515	2579	3069	2809	3253	3291
Insurance Cost Per Mission	214	219	261	239	277	280
Mission Trip Cost ($1.00)	7584	7759	8563	8196	8999	9270
(%)						
Mission Trip Cost ($2.00)	8731	8887	9785	9313	10326	10628
(%)						
Mission Trip Cost ($3.00)	9878	10015	11007	10430	11653	11986
(%)						
CASM ($1.00)	$0.090	$0.095	$0.078	$0.081	$0.076	$0.073
(%)	100.0%	105.6%	100.0%	103.2%	103.5%	100.0%
CASM ($2.00)	$0.103	$0.109	$0.089	$0.092	$0.087	$0.084
(%)	100.0%	105.1%	100.0%	102.6%	103.6%	100.0%
CASM ($3.00)	$0.117	$0.122	$0.100	$0.103	$0.098	$0.095
(%)	100.0%	104.7%	100.0%	102.1%	103.7%	100.0%

As the chart indicates, outside of the A319neo and 737 MAX 7, which are largely irrelevant in the orders race, the Boeing and Airbus products are reasonably close in operating economics. As one would expect, the 737 MAX 8 outperforms the A320neo in CASM (while the latter wins for trip cost), while the 737 MAX 9 lags the A321neo (winning a pyrrhic victory for trip costs).

The 737 MAX 8's advantage is magnified at current fuel prices, and this makes sense given that the 737 MAX 8 is a larger aircraft (spreading fixed costs over more seats) and more economical in non-fuel cost contributors (particularly maintenance). The same was true for the 737-800, which had a similar 12-seat advantage in most airlines' configurations over the A320. But the A320 has narrowed the gap substantially, and for airlines with a even a little bit of season variation in demand At fuel prices like those seen as recently as late 2014, the 737 MAX 8's advantage over the A320neo is as low as 2 percentage

points.

Meanwhile, the A321neo sustains a tangible CASM advantage of 3.5-4% over the 737 MAX 9 regardless of fuel. This sustained advantage, coupled with the performance deficits of the 737 MAX 9 and a few other factors (to be discussed in Part III) create the stunning advantage in orders for the A321neo that is the driver behind Airbus' lead in market share.

The A321neo forces Boeing's hand on MOM

So it is clear that the A321neo has the 737 MAX 9 beat (though we believe the advantage is narrower than claimed by the most ardent Airbus boosters), and despite Boeing's claims about the "Heart of the Market" it is apparent that an increased cadre of customers want and need the larger A321-sized, so-called Middle of Market (MOM) airplane. The need is probably most acute in Asia, where rapid economic growth and the continued rise of a traveling middle class are increasingly in tension with infrastructure constraints on both the ground (inadequate airport runways and terminals) and in the air (woefully underdeveloped ATC) are going to make fleets like that of Vietnam Airlines (whose smallest aircraft is the A321) more common. Particularly as long run economic growth in the developing world creates new long and thin city pairs to mirror the trans-Atlantic market, Airbus is better positioned in an MOM space that we estimate could be as large as 5,000 aircraft over the next 20-years.

And the truth of the matter is that independent of the overall battle between neo and MAX, we believe that Boeing will have no choice but to launch an MOM solution before the end of this decade. Whether that solution is a narrowbody or widebody (we lean ever so slightly towards the former), it will need to match or exceed the A321neo's seating capacity and offer airlines the ability to fly routes out to an operating envelope of 4,500 nautical miles with a full payload.

Airbus increases seating capacity against 737 MAX 200 with Space Flex

Returning to MAX and neo, the differences in seating capacity highlighted in the above chart continue to reflect broader trends in the seating capacity wars between Airbus and Boeing. And despite Airbus' posturing about seat width and passenger comfort as a gating issue for airlines, both OEMs recognize that for a large swath of the world's airlines in competitive markets or the low cost space, CASM is king. With that as the backdrop, the 737 MAX 8's 12-seat advantage over the A320neo was a tangible head-to-head advantage: one that Airbus needed to combat.

At the highest end, the Boeing 737-800 was certified to carry 189 passengers while the A320 was certified to carry 180, a 9-seat advantage or 5% advantage in seating capacity to the 737-800. But the desire of LCCs to drive down costs is never ending, so Airbus searched for a way to increase the A320's maximum seating capacity. In July of 2014, Airbus settled on the Space Flex design, expanding the A320's capacity to 189 seats by eliminating an exit door on the aircraft and adopting new slimline seats. Space Flex also adds 20 seats to the A321neo, pushing that aircraft up to a theoretical maximum of 240 seats versus 220 for the 737 MAX 9.

With Airbus closing the gap with the 189 seat A320neo, Boeing felt that it had to respond, eventually getting the 737 MAX 8 up to 200 seats by removing rear galley space and moving bathrooms to the galley. Thus the 737 MAX 200 was launched by Ryanair in September of 2014 with an order for 100 aircraft (with 100 additional purchase options). And with a 200-seat 737 MAX 8, Boeing was able to restore an 11-seat advantage (5.5%) for the 737 MAX 8. But Airbus had yet another trick up its sleeve, and in quick response to the 737 MAX 200, worked with European authorities to get certification for a 195-seat A320neo, all the while hammering Boeing for the supposed passenger discomfort of the 737 MAX 200.

The passenger experience line of criticism from Airbus was a bit rich given that the 195-seat A320neo would require nearly uniform 27-inch seat pitch versus an average of 30 inches for the 737 MAX 200 according to Ryanair CEO Michael O'Leary. Moreover, these slimline seats are almost universally despised by passengers, and so in practice, the 195-seat A320neo is likely to remain a theoretical certification envelope as opposed to a practical configuration that an airline uses in the real world. And that will likely extend to most airlines that eventually operate these aircraft at something less than the certified maximum (i.e. any airline that isn't a bottom of the barrel ULCC). The A320 is a fundamentally smaller aircraft than the 737-800 (123.25 feet in length versus 129.5 for the 737-800). With next generation aircraft that are more or less cloned copies of the previous generation, in all likelihood the same configuration differential is likely to persist.

Vinay Bhaskara *covers finance, operations and regulatory matters surrounding the U.S. and international airline industry. Bhaskara has been quoted in the Washington Post, Wall Street Journal and South China Morning Post, The LA Times, and his work has appeared in Forbes, Business Insider and Skift. You can contact him at vinay.bhaskara@airwaysnews.com.*

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