

**STATEMENT OF GEORGE DIMITROFF**  
**Head of Valuations, FlightAscend Consultancy**

**BEFORE THE U.S. INTERNATIONAL TRADE COMMISSION**  
*100- to 150-Seat Civil Aircraft from Canada*  
Inv. Nos. 701-TA-578, 731-TA-1368 (Final)

December 18, 2017

My name is George Dimitroff, and I am the Head of Valuations at Flight Ascend Consultancy. Flight Ascend is the Aircraft Valuations and Advisory division of our parent company FlightGlobal, and has clients across the aerospace and air finance spectrum. One of our most popular products is our Fleets Analyzer database, which Boeing uses extensively and has quoted in its petition.

I have been with Flight Ascend and its predecessors for 12 years, and was previously employed by both Airbus and United Airlines.

For this proceeding, Flight Ascend prepared a report that was attached to Bombardier's pre-hearing brief. I would like to focus on three specific issues which are addressed in that report.

First, the reasons why Boeing's 737 MAX 7 aircraft has limited commercial appeal relative to other product offerings in the market. Secondly, the closely related phenomenon of "up-gauging" – and finally, the issue of launch pricing.

Boeing has built its entire case against the C Series around one aircraft: the MAX 7, but what I'm about to say applies just as much to the 737-700 and also to Airbus's A319.

Both the MAX and neo families were optimized around the larger 160-seat models, but the smaller A319neo and MAX 7 models were also included.

While re-engining and shrinking a larger aircraft allowed Boeing and Airbus to get a new model onto the market faster, it had a number of disadvantages. Shrinking a larger design results in a heavier aircraft with bigger engines which is not optimized for its size, and this in turn has a negative effect on seat mile costs.

An airline's operating costs typically consist of fuel, maintenance, crew costs, landing and navigation charges, and ownership costs. Ownership cost is by no means the number one or number two cost by order of magnitude – it is a relatively small portion of the Direct Operating Cost pie. Airlines' biggest concerns when evaluating aircraft are fuel burn, reliability, and maintenance cost. Only then does ownership cost come into the equation.

To make a fair apples-to-apples comparison between different aircraft types, we set fixed parameters such as fuel price, aircraft utilization, crew pay rates and maintenance labor rates. We've used our own models that estimate aircraft operating costs, and the specific assumptions are in our report.

Our analysis, as you can see in Slide 1, shows that the 737-700 and the MAX 7 are considerably less efficient to operate than the Bombardier CS100 or CS300 on a Cash Operating Cost basis. These unfavorable economics would push an airline towards either a larger 737 MAX model, or the CSeries.

The MAX 7 was originally launched with 126 seats in a typical layout but later stretched to 138 seats in order to improve its per-seat economics. This move made the MAX 7 less comparable to the CSeries.

At the same time, there is also a trend toward “up-gauging”. This refers to airlines shifting the composition of their fleet over time towards larger models.

Up-gauging brings several benefits; the most obvious being that larger aircraft with more seats have a lower seat-mile cost – basic economies of scale.

We at Flight Ascend have seen up-gauging occur throughout the market. We see carriers like Delta and American up-gauging their 50-seat regional jets into 76 seat jets, and the 76 seat jets into the 110 seat segment. We have also seen carriers like United up-gauging from the 125 seat segment to the 150 seat segment, and even Southwest (which is a MAX 7 customer) has started to do this – they now operate the larger 737-800 and the new MAX 8.

Most of the time, the competition presented by upgauging doesn't come from other manufacturers, but from the same manufacturer. The United sale about which Boeing complains is a good example. We understand that United has converted the majority, if not all of its orders that were originally placed for the 737-700 to MAX 9s and MAX 10s.

In effect, Boeing has cannibalized the demand for its own 737-700 and MAX 7 by allowing (and we suspect encouraging) its customers to up-gauge to bigger variants of the same family. This makes sense for the manufacturers because they make better margins on the larger variants.

Using our own database, we have compiled Boeing's sales of the 737 NG family (which encompasses the -600 through -900ER) and MAX family aircraft. **Slide 2** shows that the 737-700, shown in RED, went from 60% of NG deliveries in 1998, to barely 5% of annual deliveries by 2012.

**Slide 3** shows that sales of the A319 model, also in red have similarly declined over time, in favor of sales of the larger A320 and A321.

Since Boeing no longer breaks down sales of the MAX by variant, we cannot perform the same analysis, but our impression is that the trend would be comparable to what happened with the NG. Airbus on the other hand does break down orders by type, and data for the A320ceo and A320neo series show nearly identical trends.

**Slide 4** shows in red that less than 1% of neo orders on the books today are for the A319neo *{less than 50 out of 5,251}*.

The smallest members of both the Boeing and Airbus single-aisle families – which are the 737-600 and the A318 – both failed to secure meaningful orders, largely because the per-seat economics of each of these models were even worse, being twice shrunk from the core model.

There is no indication that unfair import competition played a part in the demise of either of these models. They failed as a result of their poor economics in the segment they were trying to serve, which was approximately 110 seats.

Finally, a few words about launch pricing, especially on clean-sheet designs. Launch discounts are necessary to encourage airlines to take the risk of working with a new supplier, or even to commit to an all-new program from an existing supplier.

Bombardier's sale to Delta DOES constitute a launch pricing situation, even if they were not the first customer. Every airline that orders an aircraft before it enters service, or even before it is considered mature in service, requires launch pricing to offset the risks they are taking.

When evaluating orders, airlines want to see in-service reliability data, performance data, and fuel burn data – and clean sheet designs cannot produce such data up front.

Airlines take risk on the new technology, including delays to delivery, and in-service problems that could cause disruption to their flight schedule – which comes at a cost. Airlines want to offset that cost up-front by paying less for the aircraft. Even then, the agreed prices are

subject to years of contract escalation which raise the final fly-away price paid by the airline on delivery.

Although Bombardier had already sold some CSeries aircraft by the time the Delta sale was made, they really needed another large blue-chip customer, besides the Lufthansa group, to endorse the program.

The market has been well aware of the circumstances surrounding the Delta sale, but it is unlikely that other airlines would realistically expect to obtain a similar price on any subsequent orders they might place.

We have, over the years, observed equally advantageous, if not more advantageous pricing from both Boeing and Airbus on various programs, the most recent example being the Boeing 787.

The 787 experienced multiple delays and difficulties with its suppliers. Even after entry into service, initial reliability data was poor. Consequently, Boeing was forced to offer “launch” style pricing to multiple airlines to counteract the risk. Once Boeing won more sales and ultimately won the endorsement of the aircraft in the market, the pricing of the aircraft increased.

In summary, my three takeaways are these: 1) the MAX 7’s economics cannot compete with the CSeries because it is a bigger, heavier aircraft with more seats; 2) the MAX 7 is failing to sell mainly because airlines are up-gauging to larger MAX models; encouraged by the manufacturer; and 3) launch pricing has been common practice in the industry for decades and has been exercised by ALL manufacturers. It offsets new program risk, and does not set the bar for subsequent orders.