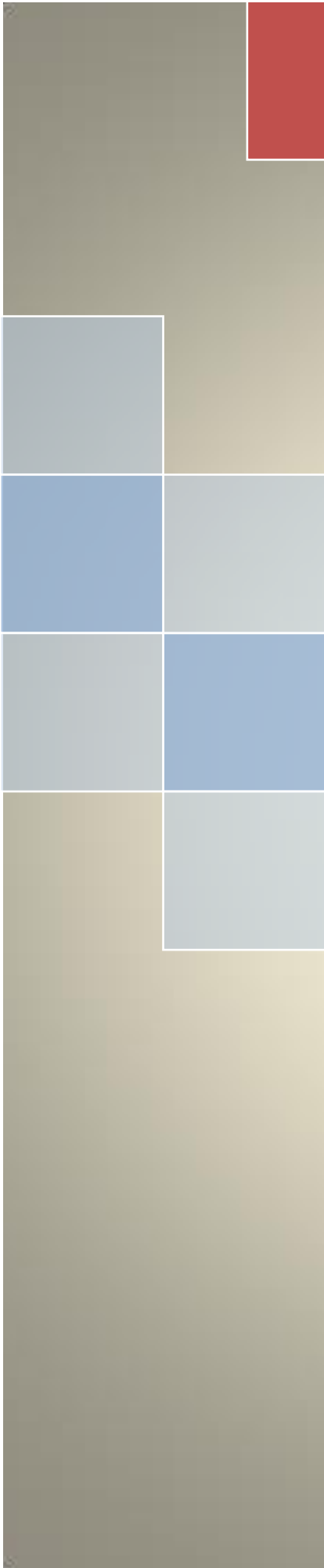


# **EXHIBIT C**



# Does the Airline Industry Suffer From Overcapacity?

*2014 Update*

Eric Amel, Daniel M. Kasper and Darin Lee  
9/15/2014



## CONTRIBUTOR BIOGRAPHIES

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## **I. OVERVIEW**

Under the Export-Import Bank’s (“Ex-Im” or “Bank”) governing statute, the Bank must publish “methodological guidelines to be used by the Bank in conducting economic impact analyses....”<sup>1</sup> The “Economic Impact Procedures and Methodological Guidelines” promulgated by the Bank following the enactment of this legislation state that “[t]he first stage of an economic analysis consists of an analysis of the long-term supply/demand balance of the global airline industry (likely differentiating between wide-body and narrow-body aircraft).”<sup>2</sup> This analysis updates our previous analysis<sup>3</sup> determining whether a “long-run structural **oversupply** exists in the industry....”<sup>4</sup>

In our June 2013 Study, we assessed whether there was structural overcapacity in the global airline industry. Our analysis began by examining the conditions that are likely to cause and/or exacerbate overcapacity in an industry.<sup>5</sup> Importantly, we demonstrated, using basic economic principles, that overcapacity occurs when underlying demand and/or supply conditions lead to prices too low to cover the industry’s full costs, including the cost of capital over a business cycle. Based on this theoretical framework, our 2013 Study examined a number of indicators that can signal when an industry suffers from overcapacity. Because overcapacity results in prices that are too low for firms to collectively cover their full economic costs, industries with excess capacity typically suffer from extended periods of negative economic profits, i.e., where the industry fails to earn a return on capital high enough to justify the levels of investments that have been made. Hence, we concluded that chronic sub-par returns are the most reliable indicator of an industry with excess capacity. The key results of our 2013 Study were that:

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<sup>1</sup> See Export-Import Bank Reauthorization Act of 2012, Pub. L. No. 112-122, 126 Stat. 357 §12(a).

<sup>2</sup> Export-Import Bank of the United States Economic Impact Procedures and Methodological Guidelines, April 2013, p. 13.

<sup>3</sup> Eric Amel, Dan Kasper, & Darin Lee, *Does the Airline Industry Suffer from Overcapacity?* June 3, 2013, (hereafter “2013 Study”).

<sup>4</sup> Export-Import Bank of the United States Economic Impact Procedures and Methodological Guidelines, April 2013, p. 13.

<sup>5</sup> As with our 2013 Study, throughout this update we use the terms “oversupply,” “overcapacity,” and “excess capacity” interchangeably.

- The worldwide airline industry had consistently (including in 2012) generated negative economic profits, i.e., returns consistently below the industry's cost of capital, which is a compelling indicator of industry overcapacity.<sup>6</sup>
- Notwithstanding the airline industry's abysmal economic/financial performance, the industry's capacity had continued to increase.<sup>7</sup>
- Given the historically unprecedented number of orders for future deliveries of widebody aircraft, even allowing for projected growth in worldwide GDP, the rapid expansion in widebody capacity was likely to exacerbate the problem of returns that do not cover the industry's cost of capital.<sup>8</sup>

In sum, our analysis concluded that the airline industry suffered from overcapacity, including for widebody aircraft, and that orders for widebodies were so robust that the overcapacity plaguing the airline industry was likely to persist for the foreseeable future.

Over a year has passed since our 2013 Study was completed, and we have therefore revisited various indicators of airline industry overcapacity to see if there have been any significant changes. Based on an evaluation of the most recent data, we find that:

- Although the airline industry was profitable in 2013 and is projected to be profitable in 2014, cumulative industry-wide profits since 2002 represent a margin of only .06%. Indeed, even though the industry's net profits in 2013 were the highest they have been in two decades, they amounted to a net margin of only 2.6%.
- Furthermore, improving relative profitability has not been uniform across all regions. For example, while U.S. carriers' profits have strengthened considerably, profits in other regions have weakened, particularly among the previously strong Asian carriers.
- Most importantly, even with the relatively higher absolute profit levels, economic profits (i.e. the difference between the cost of capital and the returns on invested capital), the key indicator of overcapacity, *has remained negative*.

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<sup>6</sup> See, 2013 Study pages 31-32.

<sup>7</sup> See 2013 Study, pages 22-23.

<sup>8</sup> See 2013 Study, Section IV.

- Finally, current widebody orders continue to increase with manufacturers reporting orders of close to 2,300 *additional* new widebodies to be delivered *through 2019*, 29% more than were delivered over the decade between 2004 and 2013.<sup>9</sup> With these orders, the estimated number of widebodies worldwide (net of retirements) is projected to increase by 5.8% per year compared to a growth rate of only 2.1% per year from 2003 to 2013.<sup>10</sup>

In sum, while the airline industry's profitability has strengthened, the fact that the industry is still unable to earn its cost of capital indicates that it still suffers from overcapacity. Moreover, based on current widebody orders, there is good reason to believe that the industry will experience overcapacity for the foreseeable future.

## **II. DOES THE AIRLINE INDUSTRY SUFFER FROM OVERCAPACITY?**

### **i. Profitability over a Business Cycle**

Our 2013 Study showed that from 2002 through 2012, the global airline industry lost \$14.1 billion.<sup>11</sup> Exhibit 1 extends the worldwide profitability data through 2014 and shows that, because of two relatively strong years (i.e., 2013 and 2014), cumulative industry profits since 2002 are now projected to be \$21.4 billion. However, the net margin (net income to revenue) over this period was only 0.06%. Thus, despite the fact that the industry has been nominally profitable since 2010, the net margins over the past four years have never exceeded 3.03%. In short, even in relatively strong years for the airline industry, its net margins are extremely low and, as discussed below, are insufficient to cover its cost of capital.

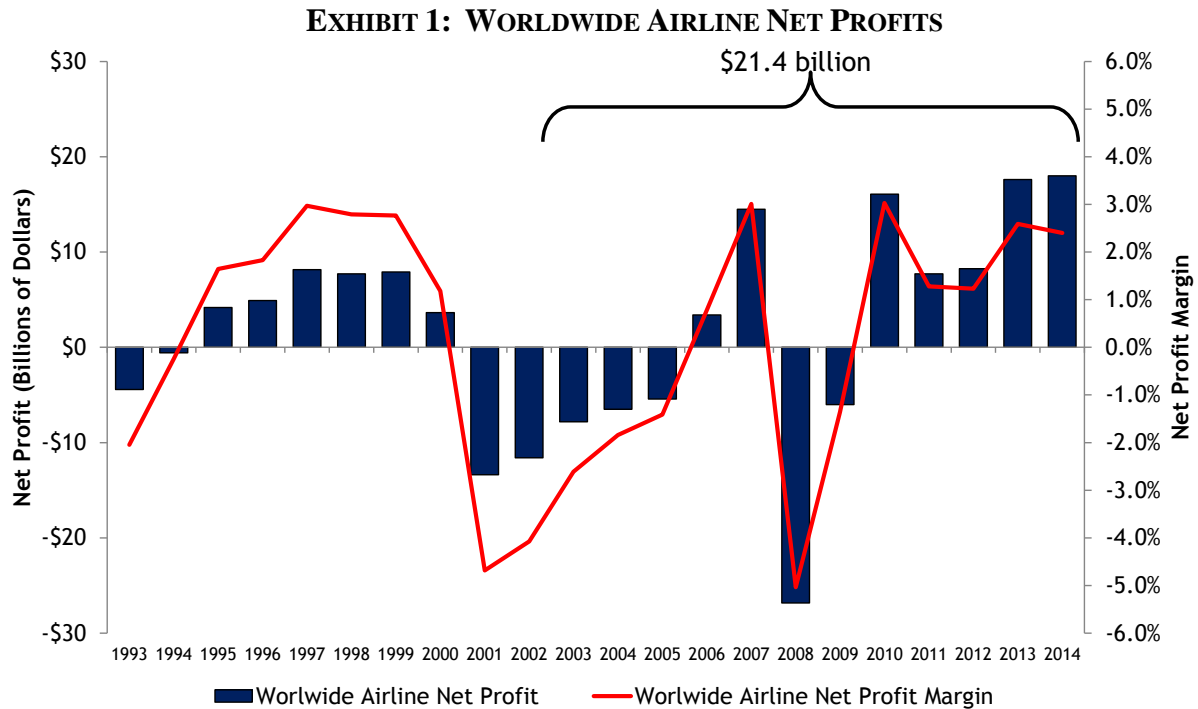
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<sup>9</sup> Source: Ascend.

<sup>10</sup> Source: Avitas.

<sup>11</sup> 2013 Study, page 29.





Sources: ICAO via A4A; U.S. DOT Form 41; IATA.

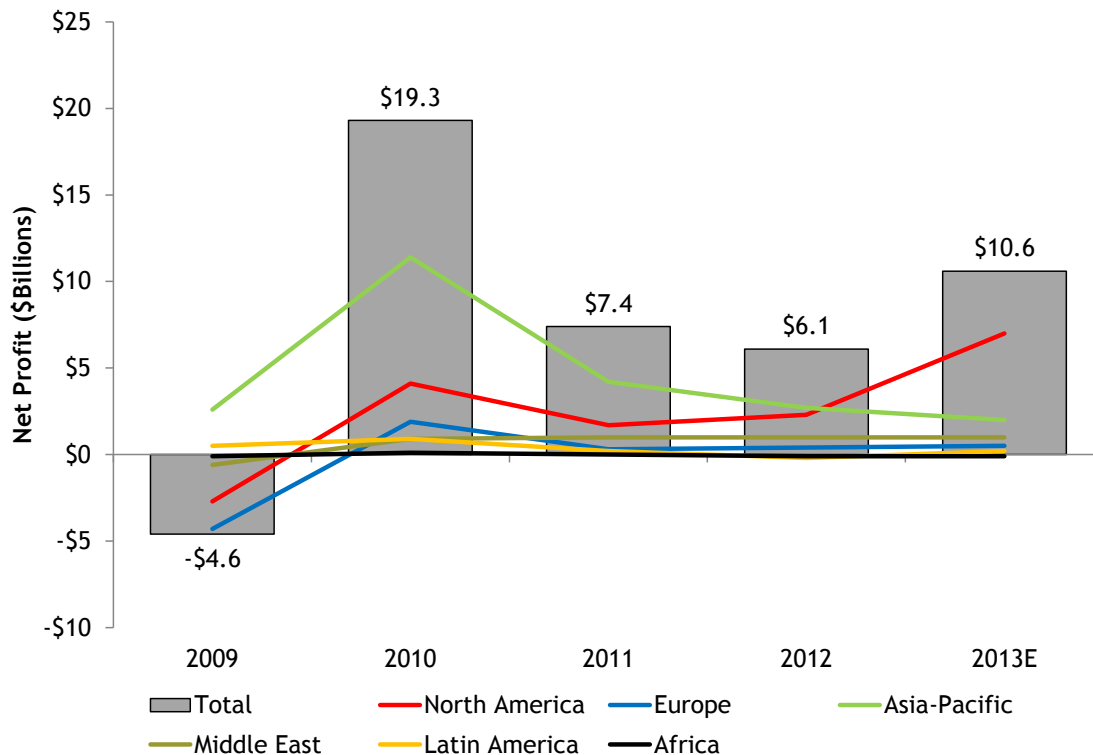
Notes: Estimated 2014 revenues and net profits from IATA, excludes U.S. air cargo/freight carriers' revenues and profits from U.S. DOT Form 41.

Moreover, improvement in profits has not been experienced in all regions. As shown in Exhibit 2,<sup>12</sup> the increase in profits in 2013 is driven almost entirely by North American carriers, whose profitability is due largely to strength in the U.S. domestic market,<sup>13</sup> a market that foreign (including state subsidized) airlines do not serve. Profits in all other regions have in fact been declining since 2010.

<sup>12</sup> The data in Exhibit 2 is from IATA while the data in Exhibit 1 (through 2013) is from ICAO and so there are some differences in the annual incomes.

<sup>13</sup> In 2013, for instance, U.S. passenger carrier profits were \$12.3 billion, of which \$7.8 billion were from domestic operations. Source: U.S. DOT Form 41. Approximately 95% of U.S. carriers' domestic capacity (as measured by available seat miles ("ASMs")) was on narrowbody aircraft (including regional jets). Source: OAG.

**EXHIBIT 2: WORLDWIDE AIRLINE NET PROFITS BY REGION OF AIRLINE**



Source: IATA, “2014 mid-year report.”  
 Note: Region based on carrier home country.

**ii. Return on Invested Capital vs. Weighted Average Cost of Capital**

Our 2013 Study also explained that if an industry suffers from overcapacity, the returns on invested capital (“ROIC”) in that industry will be below the weighted average cost of capital (“WACC”) of the firms in that industry.<sup>14</sup> Exhibit 3 reflects the most recent update of IATA’s analysis of ROIC and WACC for the airline industry. It shows that, despite the improving profitability (in some regions), industry ROIC remains below its WACC. In other words, the airline industry is still not earning enough to cover the cost of its capital. As noted in the IATA study, *“Equity owners are not rewarded adequately for risking their capital .... Investors should expect to earn at least the normal return generated by assets of a similar risk profile, the weighted average cost of capital (WACC). The average return on invested capital (ROIC) in the*

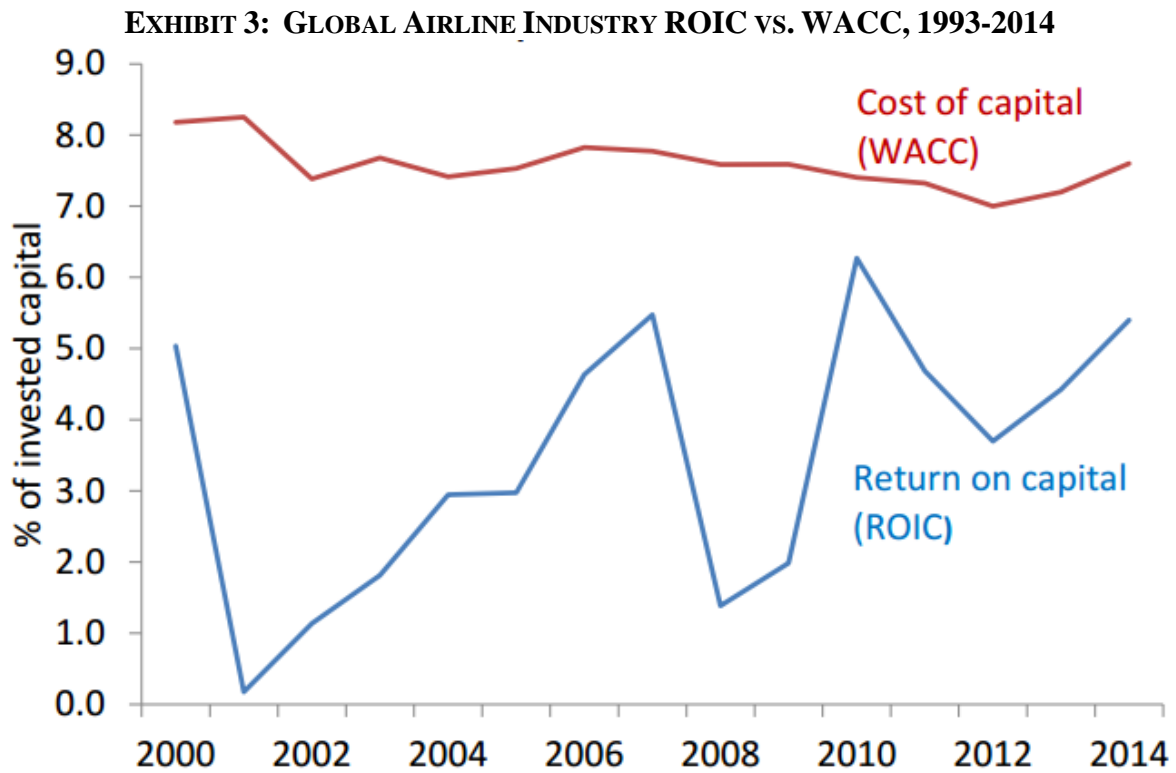
<sup>14</sup> 2013 Study, page 13.

*airline industry has been improving, and this year is expected to reach 5.4%. However, that is more than 2% points lower than it should be in an industry that is highly competitive....Equity investors are seeing their capital shrink.”*<sup>15</sup> In short, the current gap between the industry ROIC and WACC confirms that the airline industry still suffers from overcapacity, notwithstanding improving profitability.<sup>16</sup>

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<sup>15</sup> IATA, “2014 Mid-Year Report,” p. 3.

<sup>16</sup> In our 2013 Study we also considered passenger load factors and aircraft utilization. We noted that while load factor (the percentage of seats filled by passenger and weighted by distance) is a commonly reported metric of capacity utilization in the airline industry, it is *not* a reliable measure of overcapacity: “Because the marginal cost of flying an additional passenger is very low... airlines are better off filling their seats by deeply discounting a proportion of their seats to generate incremental revenue” (2013 Study, p. 37). This is due to the fact that so long as the incremental revenues generated by incremental passengers exceed the marginal cost of carrying them, they make a positive economic contribution that helps offset high airline fixed costs. As in the case of passenger load factors, airlines have an economic incentive to increase the utilization of their aircraft – even when incremental revenues are insufficient to cover their full costs – until the point that the revenues generated by increased utilization are so low that they do not even cover the marginal costs of operation. At that point incremental flights would no longer even help defray fixed costs and carriers would therefore cut back on flying. Indeed, our 2013 Study found that block hour utilization had decreased since 2008. Since then, block hour utilization has increased and is now above 2008 levels. While this increase is consistent with an improving industry, it does not, by itself, disprove the existence of overcapacity. Rather, it is simply an indication that prices have recovered enough (or marginal costs decreased enough) to make it worthwhile to fly the aircraft already in the carriers’ fleets more than previously.



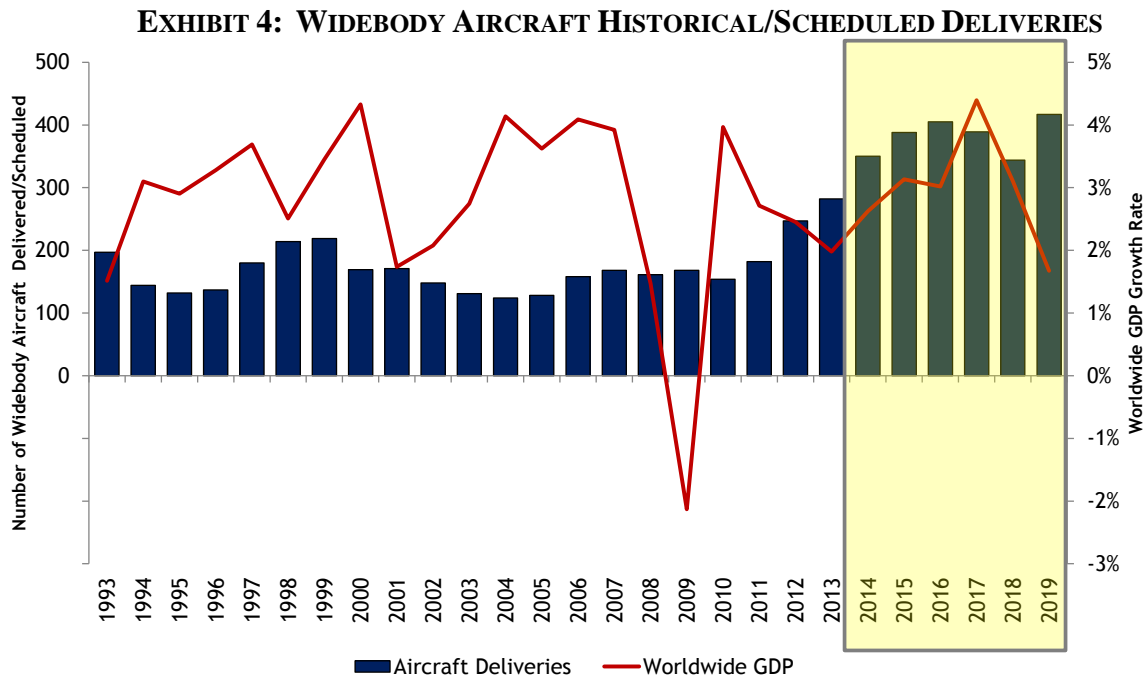
Source: IATA, "Adding value despite difficult business conditions," June 2014.

### III. IS EXCESS WIDEBODY CAPACITY LIKELY TO PERSIST?

An important question is whether current overcapacity in the airline industry is likely to persist, or if the recent improvement in profitability suggests that the overcapacity may soon be alleviated. As in our 2013 Study, we examine current orders for widebody aircraft as well as anticipated growth in airline traffic to address this question. Our analysis shows that the orders for widebody aircraft are so robust that overcapacity is likely to persist for the foreseeable future despite the recent uptick in profitability in some regions. Moreover, as shown below, one of the reasons for the extraordinary growth in widebody orders continues to be that three Gulf airlines (Emirates Airlines ("Emirates"), Etihad Airways ("Etihad"), and Qatar Airways ("Qatar")), all of whom are major beneficiaries of Ex-Im and/or European export credit agency financing, are adding to their widebody fleets at a rapid rate.

i. **Widebody Orders**

Exhibit 4 (updating Exhibit 20 from the 2013 Study) shows anticipated widebody deliveries for the next five years based on current orders.<sup>17</sup> As was true in our 2013 Study, the current scheduled deliveries are expected to be at historically high levels *for each the next five years*. Although GDP growth has improved, the annual deliveries are so unprecedented that it is unlikely that the improving economy could absorb the substantial new capacity without further depressing returns over the next few years.<sup>18</sup> Hence, it is likely that widebody overcapacity will continue for at least several more years.



Sources: Ascend; Avitas.

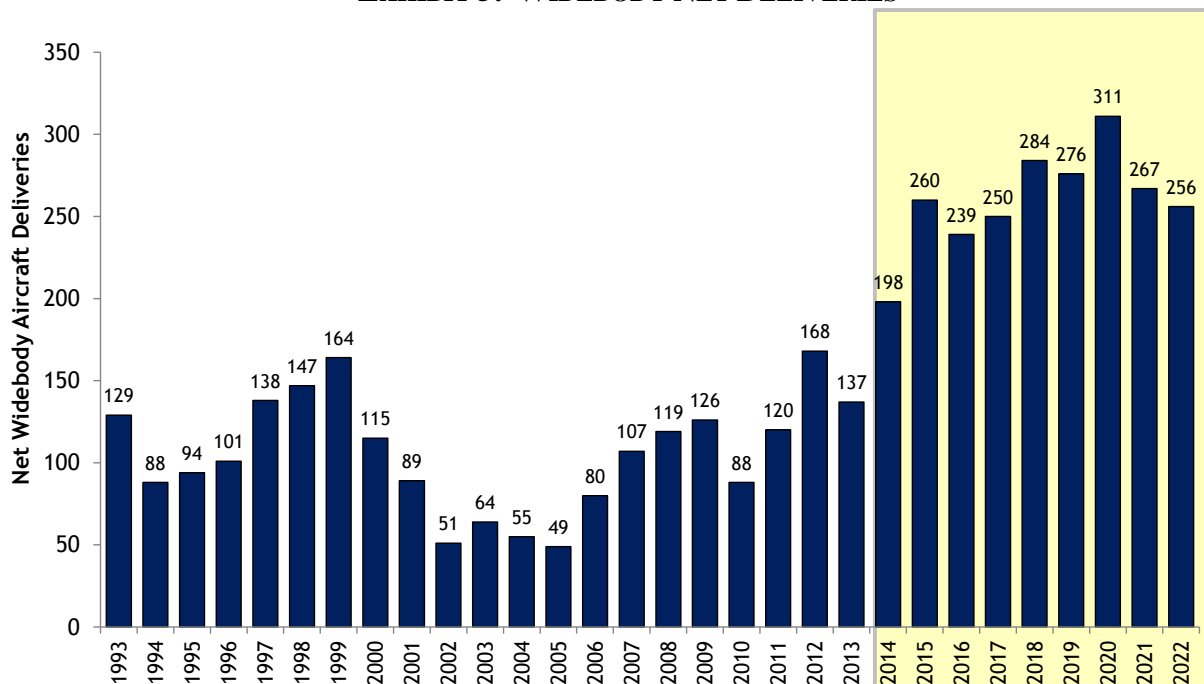
Notes: Includes passenger aircraft only. Actual deliveries through July 2014. Scheduled deliveries (shaded area) based on current orders from August 2014 through 2019. Orders include firm order, options, and letters of intent.

<sup>17</sup> Additional orders that have not yet been announced could increase this number.

<sup>18</sup> Further, GDP growth has not been robust in all regions, and future growth is uncertain as much of Europe appears to be back in a recession. See “Divisions Grow as a Downturn Rocks Europe,” *The New York Times*, August 29, 2014.

As we noted in the 2013 Study, if retirements of existing aircraft increase by enough, current overcapacity could, in theory, be eliminated. To examine whether that is a realistic possibility, we examined Avitas’ forecast of widebody deliveries *net of projected retirements* through 2022. Exhibit 5 updates that analysis. As is seen in the Exhibit below, widebody growth is expected to reach unprecedented levels, and the forecast for net deliveries has actually *increased* in each year from 2015-2022.<sup>19</sup> In sum, based on the unprecedented level of expected widebody fleet growth, there continues to be little reason to believe that overcapacity of widebody aircraft will be eliminated in the foreseeable future, notwithstanding the current improvement in industry profitability.

**EXHIBIT 5: WIDEBODY NET DELIVERIES**



Source: Avitas.

Notes: Avitas Net Deliveries are deliveries net of retirements. Actual net deliveries through 2013. Shaded area are forecasts.

<sup>19</sup> The net deliveries for 2013 are lower than projected in our 2013 Study due to revisions to the Q3-2012 Avitas forecast used in that Study. Those revisions reflected, among other things, substantial delays in deliveries of 787s. The current Avitas forecast used for this update is based on data through Q1-2014.

ii. **Overcapacity Forecast**

Our 2013 Study also utilized a regression analysis to project what global capacity would be in each year based solely on the historical relationship between capacity and the normal economic variables that would explain capacity growth: GDP, the after-effects of September 11<sup>th</sup>, and fuel prices.<sup>20</sup> As we noted, this forecast can be thought of as the “predicted capacity.” The difference between the actual/forecasted capacity and the predicted capacity from the regression is a measure of “*relative overcapacity*.”<sup>21</sup> Exhibit 6 updates that analysis and compares the regression model’s predictions to the actual/forecasted capacity for the years 2000-2019.<sup>22</sup> As shown in Exhibit 6, current capacity continues to be well in excess of what global economic activity and fuel prices would otherwise predict. Exhibit 6 also shows that the gap between the predicted and the actual/forecasted capacity is still expected to persist for at least the next several years due to the large number of widebody aircraft on order relative to expected GDP growth. As a result, the gap between the two capacity measures remains essentially unchanged from that in the 2013 Study, which suggests that industry overcapacity will continue for at least the next several years.<sup>23</sup>

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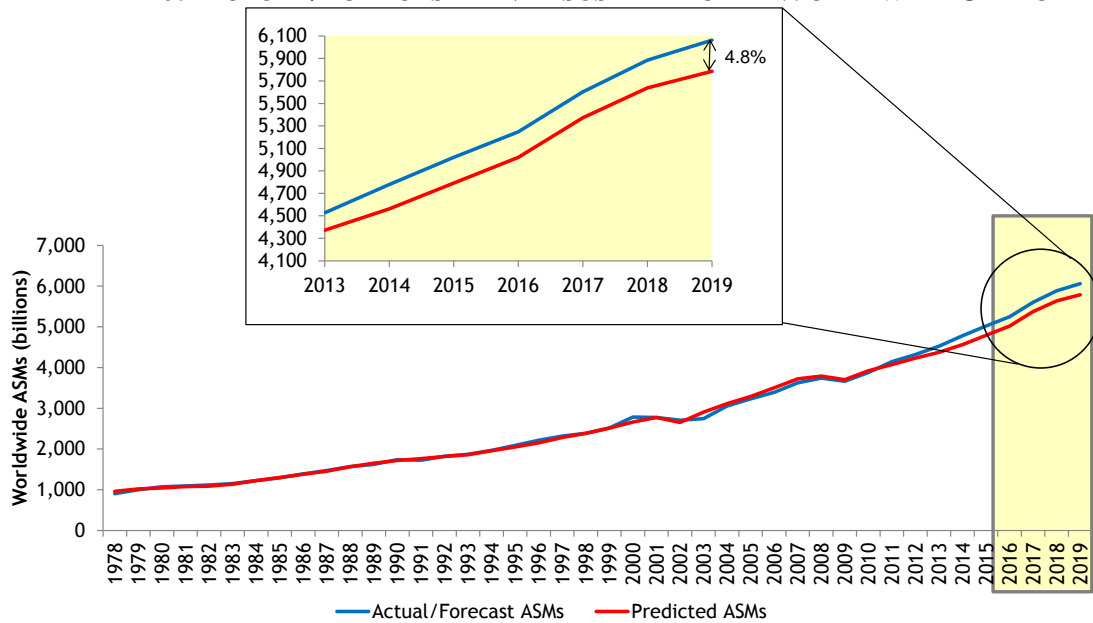
<sup>20</sup> See the 2013 Study p. 24 for more detailed discussion of the regression model and the variables used.

<sup>21</sup> If, on average, the industry were in a state of overcapacity during the period over which the regression is estimated, then even when the predicted capacity is equal to the actual/forecasted capacity this would still represent, on average, overcapacity. Hence, we refer to the difference between the predicted and the actual/forecasted capacity as the level of *relative overcapacity*.

<sup>22</sup> Predicted capacity levels for the years 2014 through 2019 are estimated using the estimated coefficients from the regression and applying them to forecasts of GDP, fuel prices, and the 9/11 Effect. Actual/forecasted capacity for these years is based on the Avitas forecast of revenue passenger miles (“RPMs”) under the assumption that ASMs will increase at the same rate as RPMs over this period.

<sup>23</sup> The difference between the actual and the predicted values are known in regression analysis as residuals. In the least squares regression model, the expected value of the residuals for the period of the data (in this case 1978-2013) is zero by construction. Since there are periods in which the residuals are positive (i.e. the actual capacity is above the predicted capacity), there will also periods in which the residuals are negative (i.e. where the actual capacity is below the predicted capacity). But, as noted in footnote 21 above, the periods in which the residuals are negative only implies that, relative to the average of the entire period of overcapacity, these periods experience less overcapacity.

**EXHIBIT 6: ACTUAL/FORECASTED VERSUS PREDICTED WORLDWIDE CAPACITY**



Sources: Avitas; A4A; OAG; U.S. Export Import Bank and ECGD Annual Reports; U.S. EIA; U.S. BEA.  
 Notes: Predicted capacity based on regression controlling for GDP, Fuel, and September 2001 impact. Historical worldwide ASMs from ICAO data obtained from A4A. GDP historical and forecast from Avitas. Historical fuel is "U.S. Kerosene-Type Jet Fuel Retail Sales by Refiners (Dollars per Gallon)" from U.S. EIA. Fuel forecast is jet fuel from U.S. EIA Annual Energy Outlook 2014 Early Release, AEO2013 Reference case (full report). Forecast ASMs based on Avitas growth rate of forecast worldwide RPMs.

### iii. Emirates Airlines, Etihad Airways and Qatar Airways

As discussed in our 2013 Study, three of the airlines that have substantial numbers of widebody aircraft on order have already benefitted from substantial (below market-rate) ECA financing assistance: Emirates, Etihad, and Qatar.<sup>24</sup> The rapid growth of these three carriers has been due—in significant part—to a concerted effort by their home country governments to use their airlines as economic development tools, and as a result, these carriers have benefited from a broad range of state initiatives aimed at facilitating their growth.<sup>25</sup> Because of their critical role in promoting their state’s economic growth agendas,<sup>26</sup> unlike privately-owned U.S. carriers,

<sup>24</sup> See Study, Exhibit 6.

<sup>25</sup> For example, in a recent address to the general assembly of the Arab Air Carriers Organization, the Director General noted that the growth of their carriers “of course not have been possible” without the “facilitating role” of states. See Jens Flottau, “Arab Carriers Praise Government Role, See Opportunity in Political Change,” *Aviation Week*, December 1, 2011.

<sup>26</sup> For example, as Qatar’s CEO Al Baker noted in a 2006 interview, “Qatar sits on the second largest natural gas deposits in the world, but still, on top of the huge progress now taking place, the Emir



their profitability is often secondary to broader government objectives.<sup>27</sup> The fact that the rapid growth by these three carriers is due, at least in part, to competitive responses to each other's growth, and that this has helped create overcapacity, has not been lost on Emirates. For example, in one issue of "Open Sky" (Emirates' public policy newsletter), the carrier quotes from a 2010 book by Rigas Doganis, noting that:

The third driver creating overcapacity in some markets is government policies. Many airlines are pressurised by their governments to expand services and widen networks in support of national policies to develop incoming tourism or local business. Such airlines tend to order or operate many more aircraft than required in the markets they are serving. The most recent and vivid example of this is that of the Gulf airlines, Etihad Airways of Abu Dhabi and Qatar Airways, which have been tasked by their governments to match the worldwide network and success of their neighbouring carrier, Emirates.<sup>28</sup>

As shown in Exhibit 7 (update of Exhibit 24 in the 2013 Study), the three carriers continued their growth unabated in 2014. In 2014, the three carriers combined accounted for 14% of all worldwide international widebody ASMs worldwide, up from slightly above one percent in 2000 (and an increase from 12% in 2012).<sup>29</sup> The strategy of these three carriers is leading to huge widebody orders even as the industry is still failing to earn adequate returns to cover its cost of capital.

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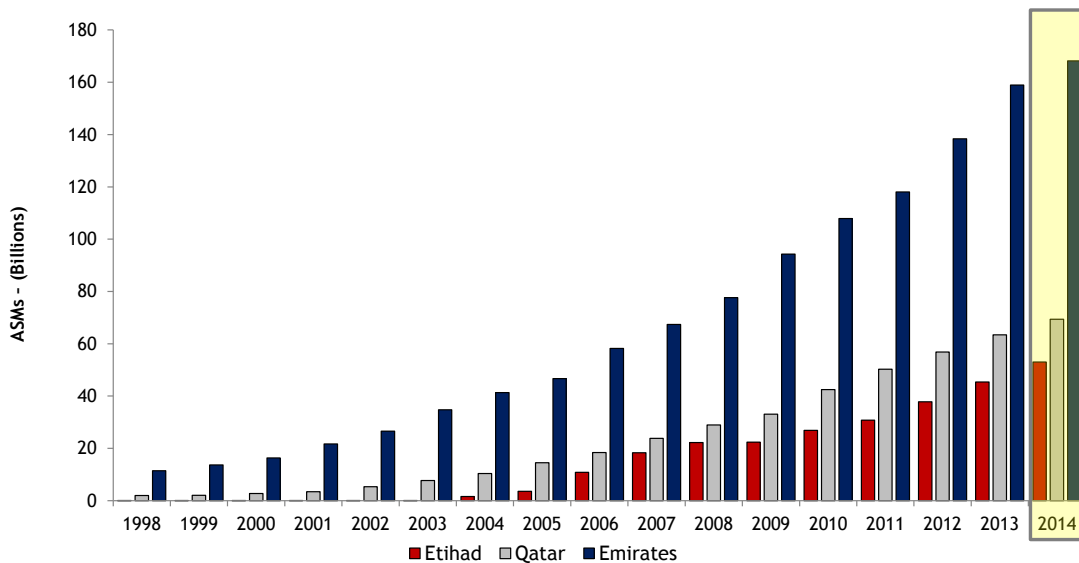
recognised that an airline is an important delivery system of achieving economic progress in a country." See "Total Control: Interview with Qatar Airways' Akbar Al Baker", *Airline Business*, March 2006.

<sup>27</sup> See, for example, "Funds-flushed Emirates, Etihad, Qatar well placed to catch the tailwinds on Indian flight path", *The Economic Times*, February 25, 2013: "[Richard] Aboulafia [Vice President of Aviation Consultancy the Teal Group] says most other airlines and lessors care solely about profit, pricing their products and running their businesses accordingly. But these players (from the Gulf), he says, are trying to preserve oil and gas wealth by converting it into something tangible — airlines, aircraft leasing, and aviation services. 'They don't need to make money, at least not in the short term.'"

<sup>28</sup> *Open Sky*, March 6, 2010, p.3., quoting from Doganis, Rigas, "Flying off course: Airline Economics and Marketing," 4th ed. London: Routledge, 2010.

<sup>29</sup> Source: OAG.

**EXHIBIT 7: ASM GROWTH OF EMIRATES AIRLINES, ETIHAD AIRWAYS, AND QATAR AIRWAYS**



Source: OAG.

As we noted in our 2013 Study, Emirates, Qatar, and Etihad are poised and committed to continuing their rapid expansion. As Exhibit 8 (update of Exhibit 26 in the 2013 Study) shows, Emirates, Qatar and Etihad rank first, second, and third, respectively, for widebody orders and each has firm orders for more widebody aircraft than are currently in their respective fleets.<sup>30</sup> Indeed, all three have *increased* their orders over the past year, with Emirates' current firm orders as a proportion of current fleet increasing to 146.5% (from 105.4%), Etihad's firm orders as a proportion of its current fleet growing to 286.4% (from 152.2%), and Qatar's growing to 198.8% (from 183.3%).

<sup>30</sup> It is reasonable to assume that at least some of the widebodies currently on order will replace the earlier vintage aircraft in their fleets by the time the new orders are delivered.

## EXHIBIT 8: CURRENT WIDEBODY ORDERS

	Carrier	Widebody Orders		Current Widebody Fleet	Firm Widebody Orders as a Proportion of Current Widebody Fleet
		Firm Orders	Options		
1	Emirates Airline	296	120	202	146.5%
2	Etihad Airways	169	56	59	286.4%
3	Qatar Airways	159	97	80	198.8%
4	Singapore Airlines	137	45	109	125.7%
5	United Airlines	89	86	160	55.6%
6	Cathay Pacific	87	4	135	64.4%
7	Air France/KLM	72	72	155	46.5%
8	American Airlines	71	59	150	47.3%
9	Japan Airlines	61	45	106	57.5%
10	British Airways	60	87	165	36.4%

Source: Ascend.

Notes: Includes passenger aircraft only. Excludes Air Lease Corporation (68 firm orders). Current fleet excludes aircraft in storage. Options include Letters of Intent. British Airways includes Iberia. American Airlines includes US Airways. Cathay Pacific include Dragonair. Singapore Airlines includes Silk Air and Scoot.

While, as we noted before, these three carriers are not—by themselves—responsible for all of the existing overcapacity, their subsidized expansion continues to make it unlikely that airline industry overcapacity will be eliminated any time soon.

### IV. CONCLUSIONS

In this update to our 2013 Study, we re-examine the key indicators of overcapacity to assess if the overcapacity that we found in the 2013 Study still persists. We have found that while airline profitability has increased in some regions, net margins have remained very low, and, most importantly, the returns on invested capital remain below the cost of capital. Thus, the industry still suffers from overcapacity. Furthermore, in light of the continued historically high orders for widebody aircraft, there is little reason to believe that the current structural overcapacity will abate in the foreseeable future.