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Economic Counsel to the Transportation Industry

Gulf Carrier Profitability on U.S. Routes

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Executive Summary

This paper reviews the available evidence on whether Gulf carriers are earning profits operating to the U.S. We conclude:

- Of the 23 routes operated by the Gulf carriers to the United States in CY 2014, 19 appear to have lost money. More than half of these routes are estimated to have loss margins in excess of 20 percent. The overall loss margin for the three carriers combined is -14.4 percent. These findings make their planned rapid growth in U.S. markets puzzling.

Following are additional details on how we reached these findings.

Our approach to estimating segment profitability for Gulf carrier operations to the U.S. relies on using the best information available. The objective is essentially to reproduce the route profitability reports for these carriers' operations to the U.S. for calendar year 2014. We acknowledge that the information we rely upon is not perfect, and we would welcome fuller disclosures by the carriers concerning their cost structures and revenue sources. For this reason, whenever possible, we took the most conservative assumption for each component of revenues and costs, meaning that we tended to err on the side of over-stating revenues and under-stating costs.

Our analysis benefited from having access to passenger origin destination data reported by the carriers.[1] We allocated revenues to Gulf carriers' flight segments between U.S. points and each carrier's Middle East hub using a methodology which results in prorates that closely correspond to those described in the *IATA Prorate Manual*, and which is typically used internally by carriers worldwide in order to allocate connecting revenues between relevant flight segments. For other revenue sources, we used data from Emirates' audited disclosures and U.S. DOT T100 data on cargo carried by the Gulf carriers on each U.S. route.

Our analysis of costs is based on:

- Estimated fuel burn for each U.S. route/aircraft combination flown by the carriers in 2014, and average estimated fuel costs per gallon[2]
- Application of Emirates' system average costs (as reported in their Annual Report for the year ending March 2015) to U.S. routes for all three Gulf carriers, including seat and distance cost tapers for certain costs.

The pro forma U.S. route P&L analysis is developed on an airline/route basis covering calendar year 2014. This corresponds to the time period for the fare and revenue data we were able to obtain for the routes. We have used year-end March 2015 system unit costs reported by Emirates, except for fuel costs which are based on route consumption and prices paid in 2014.

[1] We had access to airline–reported data via confidentiality agreements with vendors which prohibit us from revealing the source.
[2] Assumes 50 percent of fuel is purchased in U.S. and 50 percent in the Gulf.

Our results suggest that the Gulf carriers lost money on 19 of the 23 routes to the United States. More than half of these routes have loss margins in excess of 20 percent. The overall loss margin for the three carriers combined is -14.4 percent.

If the results were more evenly balanced between profit making and some loss making routes, and the overall loss margin was closer to zero, it would be more difficult to conclude whether Gulf carriers' operations to the U.S. make economic sense.

But the preponderance of loss making routes and the size of the losses suggest that the three carriers have over-expanded in U.S. markets beyond levels one could justify from the operating results. This is equally true of Emirates' fifth freedom service between JFK and Milan. No Gulf carrier shows profits on more than 30 percent of the markets it flies to the U.S. The loss margins in many markets would not be sustainable for private companies, nor would private companies be planning to expand in this theater based on such losses.

Following are additional details on our methods and results.

Are Gulf Carrier Operations to the U.S. Profitable?

As described more fully in Appendix A, our task was to estimate the route profitability report for each carrier's individual routes flown to the U.S. The production of services measured by passengers and seats flown, available seat kilometers (ASKs) and revenue passenger kilometers (RPKs), revenue ton-kilometers (RTKs) and load factors for each route were provided by each carrier's report on DOT T100 International Segment data. Revenues were estimated in three components:

- Segment Passenger Revenue is the sum of Origin and Destination (O&D) passengers flown on each segment multiplied by prorated O&D fares[3]; data at the O&D level was derived from industry sources[4], which tend to overstate average fares because they exclude direct sales by the carriers.
- Cargo Revenue for each segment is estimated as revenue ton kilometers reported to T100, multiplied by Emirates' average system cargo rate per RTK, which tends to overstate these revenues because the average system length of haul is only a third of the average distance flown on U.S. routes.
- Other Revenue is estimated using Emirates' revenues from "Excess baggage" and "Other" measured as a share of passenger revenue.

Costs were estimated following Emirates' line items in their Annual Report:

[3] The proration closely corresponds to that described in the IATA Prorate Manual.
[4] Confidentiality agreements prevent us from revealing the names of the vendors or sources of the data.

- Fuel consumption was estimated on a route/aircraft specific basis assuming great circle routing plus 2 percent; this was multiplied by GRA's estimate of Emirates' fuel cost per gallon[5]
- Except for fuel, costs were estimated on a per ASK basis as publicly reported by Emirates for the year ended March 2015.
- Some unit ASK costs were adjusted on a route-specific basis to account for the variation in such costs as equipment size (measured in seats) and distance vary from Emirates' system average; the taper factors were taken from a published paper whose results were based on internal airline cost data.[6] All of the U.S. routes are longer than Emirates' system average, and so are given a distance-based cost discount; however, the equipment types used by the Gulf carriers are mixed, with some being larger and some being small than Emirates' system average, so seat-based cost adjustments may go up or down on a specific route depending on the specific equipment utilized.

Emirates' reported average system cost per ASK for YE March 2015 was 7.64 cents, and reflects a weighted average length of haul of about 7,644 kilometers (again assuming a 2 percent circuity factor relative to great circle), and a weighted average seat size of about 414. As a comparison, our estimated cost per ASK for Emirates on their U.S. routes in calendar year 2014 is 7.55 cents. Exhibit 1 shows the estimated cost structure used in the present report aggregated across all three carriers relative to Emirates' reported system costs.

As would be expected in the long haul U.S. theater, fuel makes up a greater percentage of costs in our analysis than is reported by Emirates for its entire system. Employee costs, depreciation and amortization, and aircraft operating leases are substantially equivalent to Emirates' published numbers on a percentage basis. Other cost categories make up a slightly smaller portion of total costs in the U.S. theater. Overall costs per ASK on routes to the U.S. for the three Gulf carriers together are equal to the 7.66 cents, with larger aircraft showing lower unit costs, and smaller aircraft having higher costs.

[5] Assumes 50 percent of fuel is purchased in the U.S. at average 2014 prices estimated to be US Gulf Coast prices reported by U.S. Energy Department, Energy Information Administration plus 20 cents (for into plane and transportation costs) and 50 percent purchased in the Gulf at a 4 percent discount to U.S. prices per the IATA Fuel Monitor.

[6] Richard M. Swan and Nicole Adler (2006). "Aircraft Trip Cost Parameters: A Function of Stage Length and Seat Capacity," ***Transportation Research Part E***, 42, 105-115

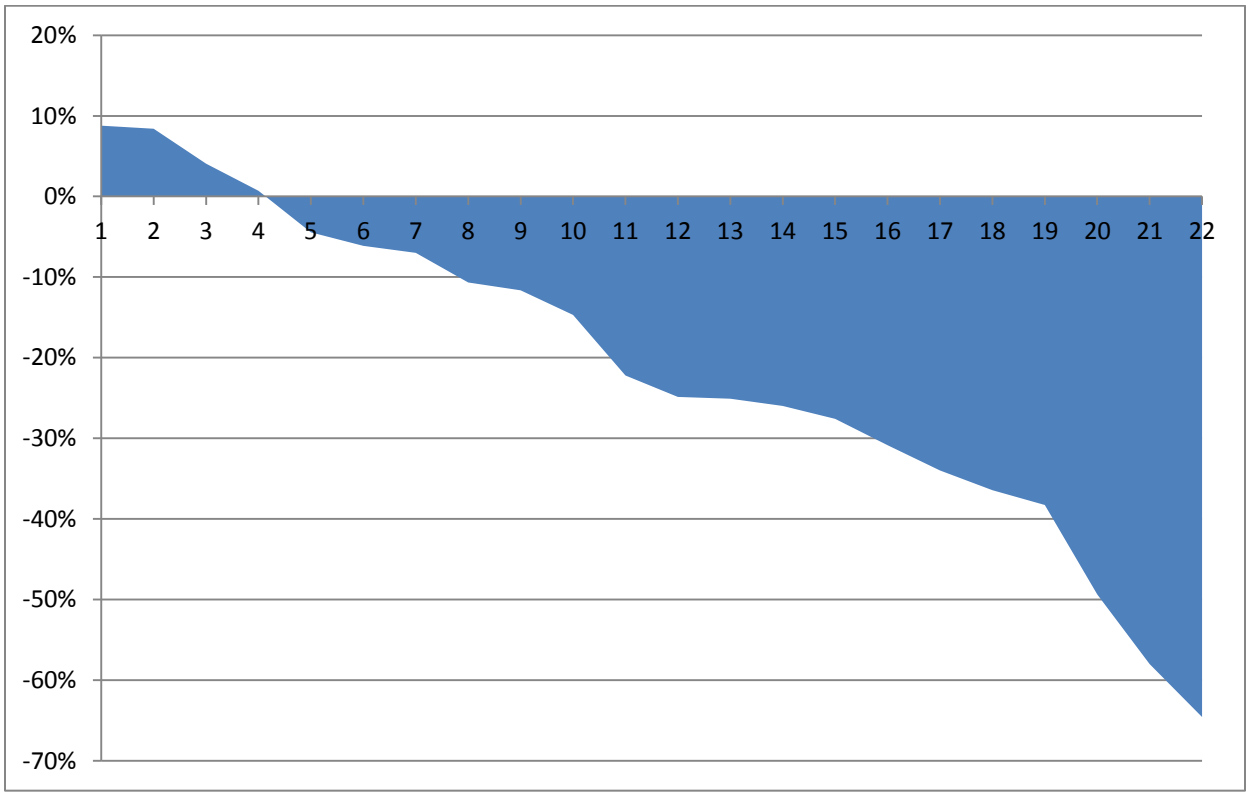
Exhibit 1: Comparison of Emirates Cost Structure with Costs Used in this Study

Cost Category	Reported Emirates System Total Cost	Estimated Gulf Carriers Cost as a Group Used in this Study
Jet Fuel	34.6%	39.4%
Employee	14.3%	14.2%
Depreciation and amortization	9.0%	9.0%
Aircraft operating leases	8.3%	8.4%
Sales and marketing	7.4%	7.1%
Handling	6.1%	5.5%
In-flight catering and related costs	4.7%	3.8%
Overflying	3.2%	2.8%
Aircraft maintenance	3.0%	2.7%
Facilities and IT	2.7%	2.5%
Landing and parking	2.1%	1.9%
Cost of goods sold	1.5%	0.0%
Corporate overhead	3.0%	2.7%
Total	**100.0%**	**100.0%**

We have estimated average revenue per ASK for the Gulf carriers' flights to the U.S. at 6.69 cents, which is lower than Emirates' reported system average of 7.66 cents (excluding non-aircraft-related revenue); this is not surprising given the very long range flights to the U.S. Of course there are variations across the three Gulf carriers in terms of costs, revenues and specific routes to the U.S.

The estimated profit margin for the three carriers' operations to the U.S. was -14.4 percent. They operated 23 routes during the year, of which four showed a profit. Exhibit 2 reports the results for 22 of the 23 routes; the 23rd route's loss margin was substantially larger and tends to distort the chart.

Exhibit 2: Profit Margin for Gulf Carrier Routes to the U.S. – CY 2014



If the results were more evenly balanced between profit making and loss making routes, and the overall loss margin was closer to zero, it would be difficult to conclude whether Gulf carriers' operations to the U.S. (as a group) make economic sense.

But our findings indicate that the three carriers have over-expanded in U.S. markets beyond levels one could justify from the operating results. No individual Gulf carrier shows profits on more than 30 percent of the markets it operates to the U.S. The loss margins in many markets would not be sustainable for a private company, nor would a private company be planning to expand in this theater.

Appendix A: Segment Route Profitability of Gulf Carriers

GRA has modeled pro forma Profit and Loss route financials for the Gulf carriers' U.S. routes operated during 2014.

Following is a table of pro forma route P&Ls modeled:

To/From	Emirates *Dubai*	Qatar Airways *Doha*	Etihad *Abu Dhabi*
Boston	✓		
Chicago O'Hare	✓	✓	✓
Dallas/Fort Worth	✓	✓	✓
Houston (IAH)	✓	✓	
New York – JFK	✓	✓	✓
Los Angeles	✓		✓
Miami		✓	
Philadelphia		✓	
Seattle	✓		
San Francisco	✓		✓
Washington – Dulles	✓	✓	✓
JFK-Milan	✓		

Data was obtained from publicly available sources as follows:

1) Revenue and Traffic

Three components of revenue were estimated: Passenger, Cargo and Other Operating Revenue.

a) Passenger Revenue
Passenger traffic by route was sourced from monthly data as reported by the Gulf carriers by U.S. route to the U.S. Department of transportation ("DOT") T-100 International Segment data files for the twelve months ended December 2014.

Total annual passenger revenue was estimated by combining the above passenger counts with an estimate of the average segment fare on each route.

The average segment fare was computed using industry data on O-D trip itineraries involving the carriers' U.S. local O-D traffic to their respective Gulf hubs, and beyond hub connections. Beyond hub connection O-D traffic was pro-rated to each component segment using a formula which closely approximates the prorate methodology from the IATA Prorate Manual, which is the industry standard source for calculating interline passenger revenue proration.

b) Cargo Revenue
Cargo revenue was estimated by combining the reported T-100 tonnage by carrier by U.S. route with system yield of 9.79 cents per revenue-ton-kilometer, as reported in Emirates' 2014-15 annual report, multiplied by each U.S. route distance to the respective

Gulf hubs. We believe this is a conservative cargo revenue estimate, as we applied Emirates' system yield to U.S. route mileage and tons carried; U.S. cargo yields are likely lower than system yields due to longer than average stage lengths.

c) Other Operating Revenue
Other operating revenue includes Excess baggage revenue and other aircraft-related revenue, and was estimated at 1.22 percent of passenger revenue for all three carriers, as reported by Emirates. Revenues accruing from the categories labelled Consumer goods, Hotel operations, In-flight catering (but see below), Food and beverage, and Destination and leisure were excluded.

2) Costs

Cost were calculated based on Emirates' fiscal year 2014 unit costs as outlined in their financial statement for their fiscal year ended 31 March 2015, and applied to Qatar and Etihad as well, with the exception of fuel and aircraft ownership costs. We believe these may be conservative, given Emirates generally greater economies of scale.

a) Fuel costs
Fuel use per flight was computed for each route using in-house data estimates of fuel usage by aircraft type and route distance.[7]

Fuel use was then combined with an estimated cost of $2.84 per gallon (derived from Emirates data for CY 2014) to compute total fuel costs for each route.

b) Other operating costs
All other operating costs for Emirates were estimated on a per ASK basis using data obtained from Emirates' financial report for the year ended 31 March 2015. These unit costs were broken down into the following categories:

- Employee costs
- Depreciation and amortization
- Aircraft operating leases
- Sales and marketing
- Handling
- In-flight catering and related costs
- Overflying
- Aircraft maintenance
- Facilities and IT
- Landing and parking
- Cost of goods sold
- Corporate overhead

The "Cost of goods sold" was eliminated since that category primarily reflects non-aircraft-related expenses. In addition, net in-flight catering costs per ASK were reduced by subtracting

[7] All route distances were estimated using great-circle distance plus a 2 percent circuity factor.

out Emirates' reported catering revenues (which primarily reflect sales to other carriers via their *dnata* service group).

Since all of the routes to the U.S. are very long-haul, it is likely that some of Emirates reported system unit costs per ASK may be lower as route distance increases. In addition, costs per ASK may also vary depending on aircraft seat size. To account for this, we used results from a paper by Swan and Adler[8] that provides estimate of distance- and seat-related operating cost elasticities for long-haul wide-body services.

We applied these elasticities to all of the above cost categories except fuel (which was computed separately for each route), employee costs, operating leases, depreciation and catering. The exclusion of employee costs, operating leases and depreciation seeks to recognize that per ASK savings from overhead staff costs (head office, revenue management, etc.) on these long-haul routes are likely to be offset by the need for heavy crews and relatively expensive U.S. domiciled staff relative to the system average. As for catering costs, long haul meal services tend to be more elaborate in all classes of services, and there are requirements for on-demand snacks between meals and staffed on-board bars. These factors suggest that catering costs per ASK may remain relatively stable even on very long routes. Depreciation and operating lease costs per ASK are likely unaffected by distance because while the carrier's routes are long haul and require more than average utilization per day, they also consume more than one unit per day. These same costs appear to be constant on a per-seat basis, based on industry valuation data.

The ASK costs then were applied to the estimated ASKs for each U.S. route. These were derived using the T-100 flights reported on each route, route distance, and equipment-specific seat sizes.

We repeated this approach to estimate pro forma P&L statements for Etihad and Qatar as well, using Emirates' unit cost data (excluding fuel and aircraft ownership costs), as reliable cost data was not available for those two carriers.

[8] Richard M. Swan and Nicole Adler (2006). "Aircraft Trip Cost Parameters: A Function of Stage Length and Seat Capacity," ***Transportation Research Part E***, 42, 105-115.