

Industry Focus: Airlines

An analysis of comprehensive debt-based factor performance

In addition to our robust library of value, growth, liquidity, momentum, and risk metrics, Markit provides several industry-specific factor suites. These include metrics for REITs, Banks and Thrifts, Retailers and others. Adding to this valuable collection of innovative industry factors, we now introduce a set of measures that provide detailed analysis of the Airline industry. As such, these statistics and ratios delineate the success of business operations specifically for Airlines.

INTRODUCTION

Acknowledging the operational idiosyncrasies for companies in particular industries or sectors is a well-tested utility used to enhance equity analysis and investment. Early methods to address these unique characteristics generally centered on the calibration of industry-relative factor scores. This is due to the fact that data sources have historically provided only a universal set of standardized financial statement items across all industries.

While the industry-relative method has met some success in the context of standard financial statement data, it fails to exploit the additional disclosure of key performance metrics provided in the financial report text. Given that the granular operating metric detail found in management's discussion was typically not available from industry-standard data sources, these useful peer-comparison tools have typically been utilized on a qualitative basis or by fundamental analysts who would gather the information manually. Our new Airline industry factor suite opens up this exclusive corporate detail to a systematic evaluation process.

The remainder of this paper will serve as an outline of our Airline industry indicators. We will itemize the comprehensive list of factors including those familiar to Airline industry analysts such as Available Seat Miles, Revenue Passenger Miles and Size of Fleet. We also offer detail on their return generating potential with an empirical analysis of univariate factor performance. Timely examination of the systematic exposures to changes in oil prices will round out the discussion.

DATA AND METHODOLOGY

Detailed Airline industry data offers a finer scope of company performance and operating condition than solely relying on data items available for all industries. Providing a competitive advantage, we consolidate several underlying data sources to build our suite of indicators. Table 1 (see Page 2) outlines the full list of available Airline-specific data items (see the Appendix for data definitions).

The data is reported on a quarterly, semiannual and annual basis. Income statement items are subsequently annualized ensuring that all data is comparable. Likewise, international companies may report measurement data in metric units; therefore, special care was taken to standardize all measurement data. All factors were subsequently ranked in descending order for this study.

We analyze each indicator on a global basis. Our constituent list is based upon data availability. Overall, the coverage ranged from approximately 20 stocks in 2001 to as high as 45 by the end of the test period. At Markit we utilize many performance statistics to quantify factor efficacy. Given the relatively small number of stocks present in the Airline industry, we feel the information coefficient (IC) is the most appropriate measure of comparison for this study. The IC is a Spearman rank correlation between factor ranks (percentile) and subsequent returns. This statistic provides a measure of the cross-sectional predictive power of the signal as opposed to the tail analysis found in spread-based statistics.

Although all Airline items were tested, several have particularly limited availability. Therefore, we report performance statistics only for those indicators with sufficient coverage, which is defined as approximately 10 securities per month. Our available test period is from January 2001 through February 2011.

Airline-specific Data Items		
# of Flight Hours	Cargo Ton Miles	Oper Exp per ASM
Aircraft Fuel	Cargo Ton Miles Yield	Oper Exp per ASM, excl Fuel
Aircraft Rentals	Commissions to Agents	Operating Revenue per ASM
Aircraft Stage, Avg Length	Current Fuel Hedge Percentage	Other Rentals & Landing Fees
ASM per Employee	EBITDAR	Passenger Revenue per ASM
Available Seat Miles (ASM)	Enplaned Passengers	Passengers, Total
Available Ton Miles	EV to EBITDAR	Percentage of Sales - Internet, Total -%
Average Number of Operating Aircraft	Fuel % of Oper Exp	Revenue Passenger Miles
Avg Age of Aircraft in Fleet	Fuel Gallons	Revenue Passengers Carried
Avg Aircraft Flight Length	Fuel Hedge Percentage Year 1	Revenue Per ASM
Avg Aircraft Utilization	Fuel Hedge Percentage Year 2	Revenue per Employee
Avg Number of Employees	Fuel Price per Gallon	Size of Fleet
Avg Passenger Fare	Load Factor	Types of Aircraft in Fleet
Avg Size of Fleet	Mail Ton Miles	Value Added per Employee
Break-even Load Factor	Maint, Materials & Repairs	Wages, Salaries, & Benefits
Cargo and Freight Revenue	Number of Trips Flown (Departures)	Yield per Passenger Mile
Cargo Load Factor	Oper Exp (net) per ASM	

Table 1

RESULTS

We begin with a univariate analysis of Airline items. Table 2 reports the average ICs for 1-, 3-, 6-, and 12-month (cumulative) holding periods. Values are averaged over the backtest period. Note, however, that the start date varies according to data availability.

	IC				Start Date
	1m	3m	6m	12m	
Avg Aircraft Flight Length	0.04	0.06	0.09	0.13	6/30/2001
Avg Aircraft Utilization	-0.01	0.01	0.04	-0.04	7/31/2001
Fuel % of Oper Exp	-0.003	0.03	0.03	0.09	4/30/2008
Load Factor	0.01	0.04	0.03	0.05	1/31/2001
Oper Exp per ASM	-0.04	-0.07	-0.06	-0.03	8/31/2006
Revenue Per ASM	-0.05	-0.10	-0.11	-0.16	9/30/2003
Revenue per Employee	0.05	0.09	0.14	0.15	6/30/2007
Yield per Passenger Mile	-0.03	-0.07	-0.05	-0.09	8/31/2002

Table 2: Univariate Information Coefficients

ICs for all factors on a 1-month basis were in the single-digit range. *Revenue per Employee* and *Avg Aircraft Flight Length* posted the highest ICs at 0.05 and 0.04 respectively. They also posted robust long-term ICs of 0.15 and 0.13, respectively. On a 12-month basis *Fuel % of Oper Exp* locked in a strong 0.09 result. Although counterintuitive at first glance, companies having fuel as a high percentage of operating expense may be more efficient in managing other key expenses such as wages, maintenance and depreciation.

Yield per Passenger Mile, on the other hand, exhibited a string of negative ICs. This factor is a common gauge of utilized capacity yield. It is computed as the passenger revenue per revenue passenger mile.

In Figure 1 (see Page 3) we take a more detailed look at the time series behavior of this factor. The chart displays the average monthly ICs for each calendar year. After commencing with a significant negative dip in 2003, the series cycled between significant and neutral levels. However, the data series is marked by a significant peak in 2007. This is coincident with a run-up in the price of oil in the triple-digit range. Companies that had the most pricing power were rewarded in this period marked by spiking oil prices.

We next look at year-over-year changes in those items from Table 1 (see Page 2) that may merely proxy for size when considered on a standalone basis. *Size of Fleet* is one such example, as on a standalone basis it will consistently favor larger Airlines, thus clouding any performance analysis. By converting the values to year-over-year percentage changes, all companies can be analyzed on an equal footing. In addition, by using a year-over-year analysis we mitigate any seasonal effects present in the quarterly data.

Table 3 presents average ICs for the year-over-year changes in the selected indicators. Again, note that a later start date may be used if sufficient coverage is not available. In general, the 1-month ICs were neutral with levels in the low single-digit range. Differentiation did not take hold until longer holding periods were considered.

	IC				Start Date
	1m	3m	6m	12m	
# of Flight Hours YOY	0.00	0.01	0.04	0.06	2/28/2002
Aircraft Fuel YOY	-0.05	-0.10	-0.04	-0.09	9/30/2006
Available Seat Miles (ASM) YOY	0.02	0.02	0.02	0.04	5/31/2001
Avg Number of Employees YOY	0.03	-0.03	-0.11	-0.17	6/30/2002
EBITDAR YOY	0.03	0.04	0.01	-0.06	12/31/2005
Number of Trips Flown (Departures) YOY	0.00	-0.01	-0.09	-0.12	9/30/2006
Passengers, Total YOY	-0.01	0.03	0.04	0.07	8/31/2006
Revenue Passenger Miles YOY	0.03	0.03	0.03	0.03	6/30/2001
Revenue Passengers Carried YOY	0.00	0.01	-0.02	0.01	6/30/2001
Size of Fleet YOY	-0.02	-0.04	-0.08	-0.13	9/30/2001
Wages, Salaries, & Benefits YOY	0.05	0.05	0.06	0.11	9/30/2007

Table 3 - Year-over-year change Information Coefficients

For the 12-month holding period the highest ICs were posted by *Wages, Salaries, & Benefits YOY* (0.11) and *Passengers, Total YOY* (0.07). *# of Flight Hours YOY* trailed not too far behind at a level of 0.06. At the other end of the spectrum, *Avg Number of Employees* (-0.17) and *Size of Fleet YOY* (-0.13) witnessed the most negative ICs.

In Figure 2 we present the average annual ICs for *ASM YOY*. ASM is a widely-used indicator that measures the capacity of the company fleet. Changes can be affected by modifications to the number of aircraft or to seating on existing aircraft.

The ICs oscillated around more neutral levels up until the latter years of the analysis. Companies were punished in general in 2008 for adding capacity, particularly in the first six months of the year, as the price of oil approached its peak in mid-year, but then a rebound ensued. Curiously, the recent increase in oil prices has not instilled the same fate on airline stocks as this factor has had positive results thus far in 2011.

Yield per Passenger Mile

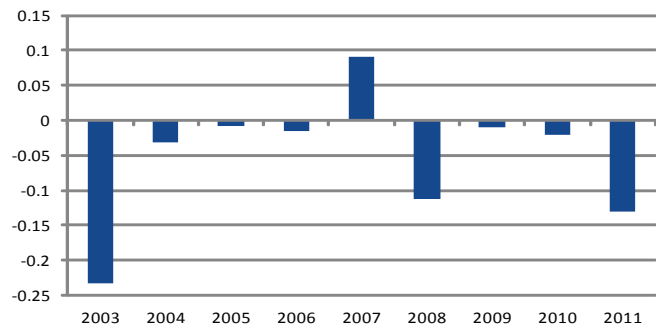


Figure 1 - Annual Average 1-month ICs

Available Seat Miles (ASM) YOY Change

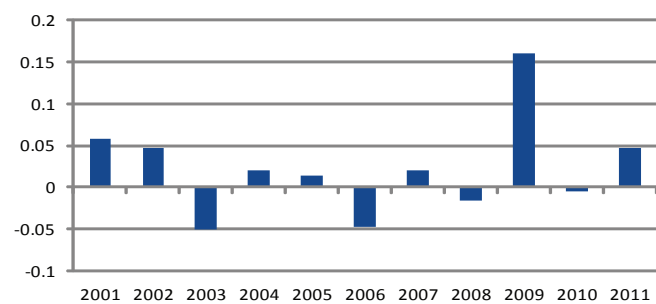


Figure 2 - Annual Average 1-month ICs

Factor Introduction

We turn now to an analysis of two additional factors including *Operating Margin per ASM* and *Total Revenue Operating Margin per ASM*. *Operating Margin per ASM* is computed as passenger revenue less operating expenses per available seat mile. *Total Revenue Operating Margin per ASM* also considers total revenue less operating expenses per available seat mile, but includes revenue sources beyond passenger fares such as cargo, in-flight services, and fees for ticket changes.

Summary IC results for these factors are provided in Table 4. *Operating Margin per ASM* registered stronger performance including a 6-month IC of 0.15 and a 12-month IC of 0.12. The ICs for *Total Revenue Operating Margin per ASM* were weaker with neutral levels for all holding periods. It is interesting to see such a distinction in performance, particularly for the longer holding periods. Further analysis (not presented here) determined that the difference between these seemingly similar factors is primarily due to a variation in historical coverage.

	IC				Start Date
	1m	3m	6m	12m	
Operating Margin per ASM	0.06	0.10	0.15	0.12	1/31/2005
Total Revenue Operating Margin per ASM	0.03	0.03	0.04	0.03	8/31/2005

Table 4 - Factor Information Coefficients

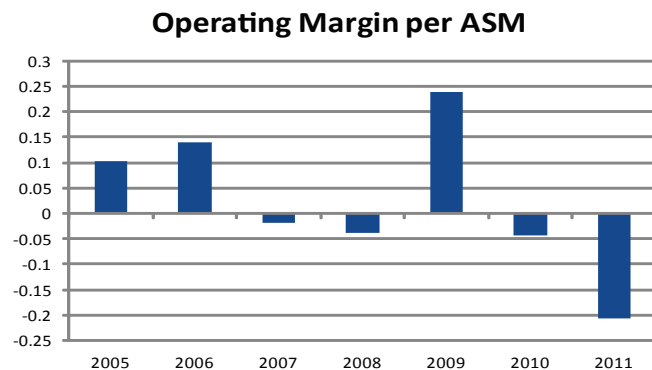


Figure 3 - Annual Average 1-month ICs

Figure 3 charts the annual average ICs providing more detail for the *Operating Margin per ASM* factor. Most of the significant observations are in positive territory. Just one large negative spike occurred (2011). Therefore, overall we see that companies were in general rewarded for superior margin management.

Significant IC levels for 2011 are depicted in each of Figures 1 through 3 (see Pages 3 and 4). This highlights the impact of the recent oil price spike brought about by Middle Eastern turmoil and a collapsing dollar due to a profligate Federal Reserve.

To study the interaction between Airline factor

performance and oil prices in more detail, we utilize one of our recently introduced macroeconomic indicators, Change in Oil Price (OIL). For reference see Markit Factor Introduction – *Macroeconomic Factor Suite*, January 2011.

Table 5 focuses on the correlations of OIL with several Airline industry factors of interest. The table provides short-term (1-month) and long-term (12-month) contemporaneous correlations between OIL and factor ICs. Significantly positive relationships would imply that rising (falling) oil prices have a positive (negative) effect on factor performance.

	Correlations	
	1m	12m
Available Seat Miles (ASM)	0.00	0.13
Fuel % of Oper Exp	-0.28	-0.09
Load Factor	0.03	-0.09
Operating Margin per ASM	0.07	0.22
Revenue Passenger Miles	0.01	0.14
Revenue per ASM	-0.06	0.31
Yield per Passenger Mile	0.13	0.32

Table 5 - Performance (IC) Correlation with Change in Oil Price

Several noteworthy associations do indeed arise from the analysis. Significant positive correlations are realized on a 1-month horizon for *Yield per Passenger Mile* (0.18) and *Operating Margin per ASM* (0.07). Airlines with higher levels of operating efficiency would be less adversely affected by positive OIL changes, and in turn offer a more desirable investment than their peers in such an environment. Note the relationship is enhanced over the longer term period.

Conversely, a negative correlation was posted by Load Factor with a long-term level of -0.09. *Load Factor* is a measure of capacity utilization. A high level implies that the airline is operating at full capacity. Thus, a negative correlation implies that a rise in oil prices typically corresponds to outperformance by airlines with low load factors. These are airlines operating at a comparatively low level of capacity utilization. Possibly the market perceives that, as oil prices rise, those airlines with more unused capacity are able to cancel flight routes, thereby mitigating the impact of rising fuel costs, without substantially impacting their business. Again this only influenced long-term investments as the shorter-term correlation was neutral.

CONCLUSION

In this research note we introduce a new industry-specific signal suite for Airlines. Data that was previously more amenable to a fundamental process is now available for quantitative analysis, thus allowing more sophisticated comparison of companies beyond the standard financial-statement-derived ratios.

We began by introducing a large list of Airline industry items. This extensive directory covers revenue, expense, margin, capacity, and other factors. We next delved into the performance analytics of those indicators where a wide breadth of coverage was available. We considered both point-in-time cross-sectional results as well as year-over-year changes.

Due to the limited coverage available, we based our performance analysis on IC statistics. Information was provided over a 1-, 3-, 6-, and 12-month time horizon. ICs for all factors on a 1-month basis were in the single-digit range. On a point-in-time basis, *Revenue per Employee* and *Avg Aircraft Flight Length* proved two of the most effective measures with average 1-month ICs of 0.05 and 0.04, respectively. Overall, the highest IC also occurred for *Revenue per Employee* (0.15) at a 12-month horizon.

Moving to the year-over-year change analysis, we found more neutral ICs on a 1-month basis. However, over a 12-month period *Wages, Salaries, & Benefits YOY* (0.11) and *Passengers, Total YOY* (0.07) had noteworthy, positive ICs. *Avg Number of Employees YOY* (-0.17) and *Size of Fleet YOY* (-0.13) posted the most negative average ICs over the same holding period.

Further factor analysis was provided for two measures of expense management including *Operating Margin per ASM* and *Total Revenue Operating Margin per ASM*. The superior of the two factors proved to be *Operating Margin per ASM* with positive ICs for all holding periods and more robust levels at the 6- and 12-month horizons.

We wrapped up the report with a timely analysis of the impact of OIL on Airline factor performance. We found that OIL indeed exhibited a significant relationship with factor results in several cases. The greatest effect was posted for *Yield per Passenger Mile* at a 0.32 correlation on a 12-month basis.

FACTOR LIBRARY ADDITIONS

While we have presented numerous factors for consideration in this report, seven indicators were ultimately chosen as key measures for inclusion in the Markit Factor Library. These selections were made based on performance characteristics as well as intuitive appeal. They include:

- Available Seat Miles (ASM)
- Fuel % of Oper Exp
- Load Factor
- Operating Margin per ASM
- Revenue Passenger Miles
- Revenue per ASM
- Yield per Passenger Mile

Year-over-year changes for each indicator will also be included in the library. Note that we enforced a strict limitation on the Markit Research Platform requiring coverage of at least 10 securities per month thus affecting performance analytics.

APPENDIX

of Flight Hours - Total number of airborne hours during a year.

Aircraft Fuel - Fuel and oil operating expense for the period.

Aircraft Rentals - Aircraft Rental expenses for the period.

Aircraft Stage, Avg Length - Average distance flown per flight of an airline.

ASM per Employee - Available seat miles per average number of employees.

Available Seat Miles (ASM) - Total number of seats available multiplied by the distance traveled measured.

Available Ton Miles - Maximum cargo space available multiplied by the total mileage flown in the fiscal period.

Average Number of Operating Aircraft - Average number of aircrafts used by an airline during a period of time.

Avg Age of Aircraft in Fleet - Average age for all aircraft in fleet.

Avg Aircraft Flight Length - Average length of all flights during the fiscal period.

Avg Aircraft Utilization - Average hours per day each aircraft is actively used during the fiscal period.

Avg Number of Employees - Average number of employees for the fiscal period.

Avg Passenger Fare - Average passenger ticket price.

Avg Size of Fleet - Average number of planes in the fleet for the period.

Break-even Load Factor - Break-even point where expenses equal revenues, expressed as a percentage.

Cargo and Freight Revenue - Revenue derived from cargo, freight, and mail for the period.

Cargo Load Factor - Break-even point where expenses equal revenues, expressed as a percentage.

Cargo Ton Miles - Used cargo space multiplied by the total mileage flown in the fiscal period.

Cargo Ton Miles Yield - Operating income divided by cargo ton miles.

Commissions to Agents - Commission costs to agents for passenger ticket sales for the period.

Current Fuel Hedge Percentage - The percentage of fuel needs that the company has hedged for the fiscal year.

EBITDAR - Aircraft rental expenses added to EBITDA.

Enplaned Passengers - Total number of revenue passengers boarding aircraft.

EV to EBITDAR - Enterprise Value / EBITDA+Rentals

Fuel % of Oper Exp - Total fuel cost as a percentage of operating expenses.

Fuel Gallons - Total quantity of fuel consumed in the fiscal period.

Fuel Hedge Percentage Year 1 - The percentage of future fuel needs that the company has hedged for the next fiscal year.

Fuel Hedge Percentage Year 2 - The percentage of future fuel needs that the company has hedged for year 2.

Fuel Price per Gallon - Weighted average cost of fuel for the fiscal period.

Load Factor - Revenue passenger miles divided by available seat miles (expressed as a percentage).

Mail Ton Miles - Used mail cargo space multiplied by the total mileage flown in the fiscal period.

Maint, Materials & Repairs - Maintenance and repair costs for owned and leased flight equipment for the period.

Number of Trips Flown (Departures) - Number of takeoffs made at an airport.

Oper Exp (net) per ASM - Operating Expense (net of non-ASM revenue) per ASM.

Oper Exp per ASM - Operating expense per available seat mile.

Oper Exp per ASM, excl Fuel - Operating expense, less aircraft fuel, per available seat mile.

Operating Revenue per ASM - Total operating revenue earned per available seat mile of the airline.

Other Rentals & Landing Fees - Facilities rent, landing fees and related expenses for the period.

Passenger Revenue per ASM - Total passenger revenue earned per available seat mile of the airline.

Passengers, Total - Number of persons on board a flight who is not a member of the flight or cabin crew.

Percentage of Sales - Internet, Total - % Company level portion of sales that is made from the internet, as reported by the company.

Revenue Passenger Miles - Total number of revenue-paying passengers aboard the aircraft multiplied by the distance traveled.

Revenue Passengers Carried - Total number of passengers carried during the fiscal period.

Revenue Per ASM - Revenue derived from Available Seat Miles.

Revenue per Employee - Revenue per Employee.

Size of Fleet - Number of aircraft operated by a single company or ownership.

Types of Aircraft in Fleet - The number of different types of aircraft an airline uses.

Value Added per Employee - Value added within the company divided by the number of employees as of the most recent annual report.

Wages, Salaries, & Benefits - Operating cost of employee wages, salaries and benefits for the period.

Yield per Passenger Mile - Passenger revenue per revenue passenger mile.

About Markit

Markit is a leading, global financial information services company with over 2,200+ employees.

The company provides independent data, valuations and trade processing across all asset classes in order to enhance transparency, reduce risk and improve operational efficiency.

Its client base includes the most significant institutional participants in the financial marketplace.

More Information

For more information on the products and services from Markit, please contact us at sales@markit.com or call one of our regional offices:

London	+ 44 20 7260 2000
New York	+ 1 212 931 4900
Naperville	+ 1 630 637 8088
Dallas	+ 1 972 560 4420
Sydney	+ 61 2 0 89 89 80
Tokyo	+ 81 3 6402 0130
Singapore	+ 65 6499 0088
Frankfurt	+ 49 69 299 868 140
Amsterdam	+ 31 20 502 5800

These materials are confidential. Distribution is Prohibited.

Opinions, estimates and projections in this report constitute the current judgment of the author(s) at the time of writing. They do not necessarily reflect the opinions of Markit Group Limited. Markit Group Limited has no obligation to update, modify or amend this report or to otherwise notify a reader thereof in the event that any matter stated herein, or any opinion, projection, forecast or estimate set forth herein, changes or subsequently becomes inaccurate.

The content, information and any materials ("data") provided by Markit in this presentation is on an "as is" basis. Markit Group makes no warranty, expressed or implied, as to its accuracy, completeness or timeliness, or as to the results to be obtained by recipients, and shall not in any way be liable to any recipient for any inaccuracies, errors or omissions herein. Without limiting the foregoing, Markit Group shall have no liability whatsoever to a recipient of this report, whether in contract (including under an indemnity), in tort (including negligence), under a warranty, under statute or otherwise, in respect of any loss or damage suffered by such recipient as a result of or in connection with any opinions, recommendations, forecasts, judgements, or any other conclusions, or any course of action determined, by it or any third party, whether or not based on the content, information or materials contained herein.

Copyright © 2012, Markit Group Limited. All rights reserved. Any unauthorised use, disclosure, reproduction or dissemination, in full or in part, in any media or by any means, without the prior written permission of Markit Group Limited is strictly prohibited.