



Charon Special
Situations Group

US AIRLINES

25 MARCH 2019



US Airlines
Tactical Trading Strategy

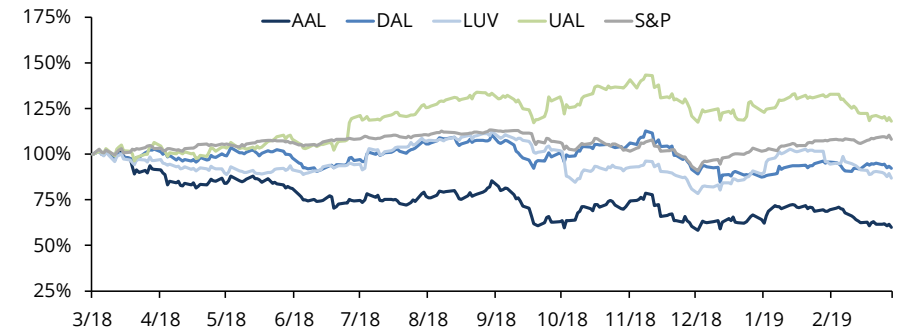
Since 1978, the American airline industry has faced a rich history including governmental deregulation, 200+ bankruptcies, and 40+ M&A transactions. Given its eventful but oligopolistic characteristics, we believe the inefficiencies will allow for relative value opportunities across the sector's capital structure.

- **American Airlines Group Inc.** has a term loan heavy cap stack. We believe Fed rate changes will not cause interest to rise substantively but headwinds will materialize when seasonality, oil prices, and events (such as the 737 Max restriction) negatively converge. [We recommend a short equity long CDS trade or trading its two unsecured issues against Southwest or Delta bonds \(which have a better balance sheet\).](#)
- **Delta Air Lines, Inc.** exhibits a large cash balance, good debt management, and relatively new IG status, making it financially one of the best airlines in the space. [We suggest pairing a Delta short trade against short term to maturity bonds \(which tend to be less volatile\). Other alternatives include going long on Delta bonds and shorting lesser credit airlines or trading the spread between Delta CDS and other single name CDS.](#)
- **Southwest Airlines Co.** is a smaller airline but like Delta, demonstrates many credit positive qualities such as lower fuel costs which will help it power through 2020. [We suggest similar trades to our Delta recommendations.](#)
- **United Continental Holdings, Inc.** is unique in that most of its capital structure consists of EETCs and other asset-backed securities. [We suggest similar trades to our American Airlines recommendations.](#)

Contents:

[Macro View](#), [Airline Tracking Data](#), [Investment Thesis](#), [Fundamental Trade Ideas](#), [Example Trades](#), [Airline Securities Overview](#), [Appendix](#)

Figure 1: Equity Performance & Company Details



| Ticker (in \$MM, TTM) | US Airlines | | | |
|-----------------------|-------------------|-----------------|--------------------|-----------------|
| | AAL (US:NASDAQ) | DAL (US:NYSE) | LUV (US:NYSE) | UAL (US:NASDAQ) |
| Issuer | American Airlines | Delta Air Lines | Southwest Airlines | United Airlines |
| Ratings | BB-/Ba3/BB- | BB+/Baa3/BBB- | BBB+/A3/BBB+ | BB/Ba2 |
| Price (03/19/2019) | \$30.57 | \$49.76 | \$49.32 | \$79.63 |
| 52-Week Range: | \$29.72-52.14 | \$45.61-60.71 | \$44.40-63.77 | \$64.87-96.70 |
| Shares Outstanding: | 466 | 694 | 574 | 277 |
| Market Cap: | \$14,235 | \$34,533 | \$28,310 | \$22,034 |
| Total Debt: | \$23,779 | \$9,368 | \$3,377 | \$13,445 |
| Total Capitalization: | \$38,014 | \$43,902 | \$31,687 | \$35,479 |
| Enterprise Value: | \$37,739 | \$42,337 | \$29,833 | \$33,785 |
| Diluted EPS: | \$3.03 | \$5.67 | \$4.29 | \$7.69 |
| P/E: | 10.1x | 8.8x | 11.5x | 10.3x |
| EV / Sales: | 0.8x | 1.0x | 1.4x | 0.8x |
| EV / EBITDA: | 7.8x | 5.6x | 6.8x | 6.1x |
| Debt to Cap: | 62.6% | 21.3% | 10.7% | 37.9% |
| Secured Leverage: | 4.7x | 0.5x | 0.2x | 2.2x |
| Leverage: | 4.9x | 1.2x | 0.8x | 2.4x |
| Net Leverage: | 4.9x | 1.0x | 0.3x | 2.1x |
| Coverage: | 4.6x | 24.4x | 33.6x | 7.6x |
| Last Reporting Date: | 02/25/19 | 02/15/19 | 02/05/19 | 02/28/19 |

The bond market is pricing in the yield curve inversion; we think it is still too early for recession, but we believe catalysts are incoming.

Figure 2: US Economic Indicator YoY Percent Growth

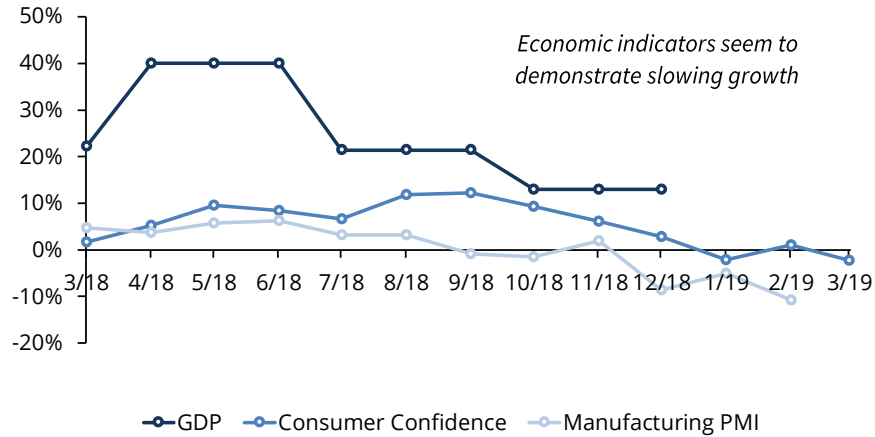


Figure 3: Daily Treasury Yield Curve

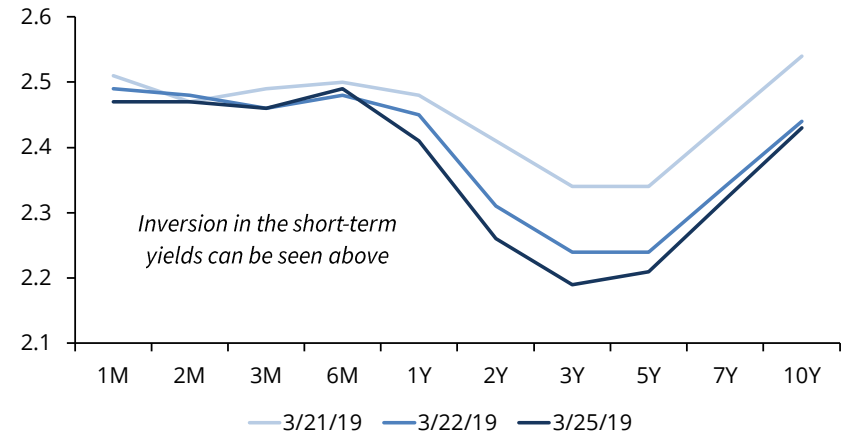


Figure 4: North American CDS Index

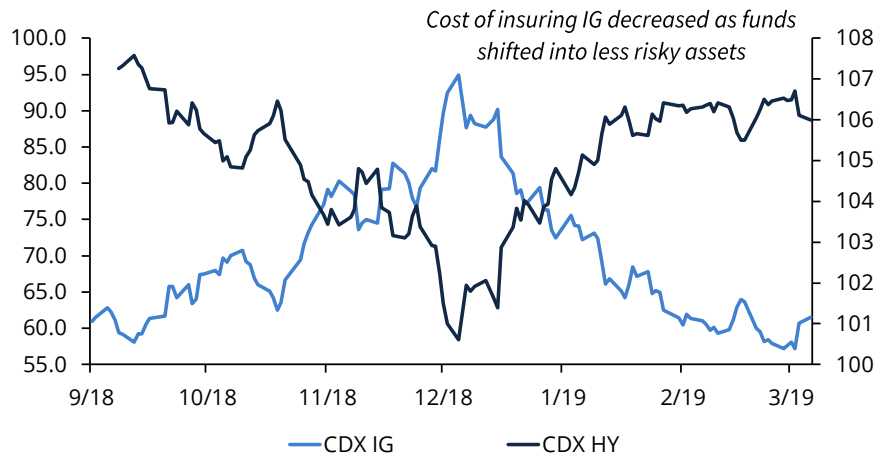
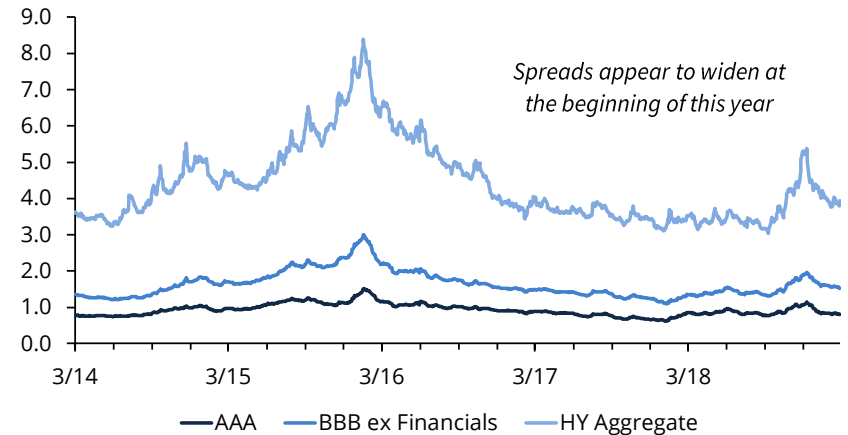


Figure 5: US Corporate Bond OAS



Fares and EBITDA margins appear cyclical; oil prices appear stable; however, capacity adds seem too positive compared to outlook.

Figure 6: Total US Fare Volume (in \$BN)

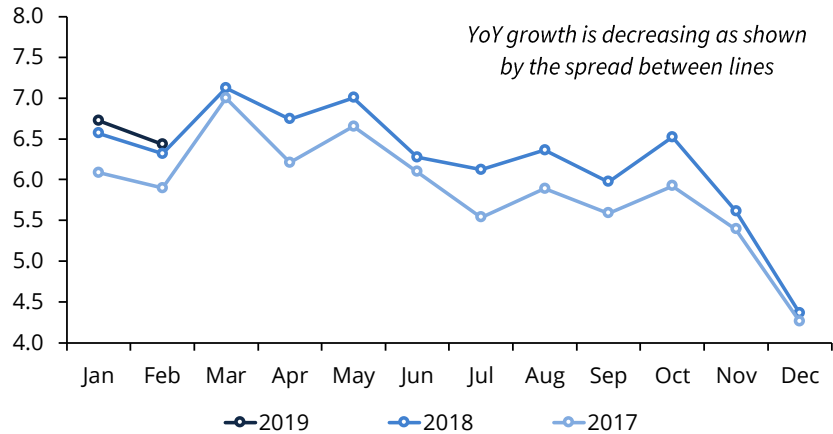


Figure 7: EBITDA Margins

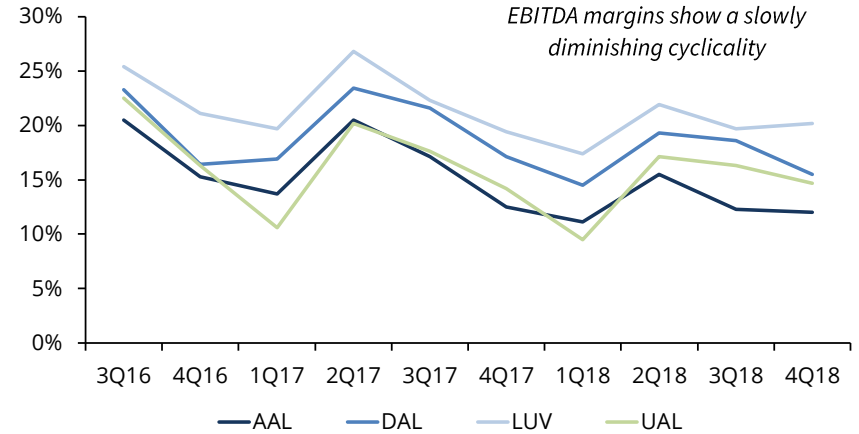


Figure 8: Energy Market Pricing

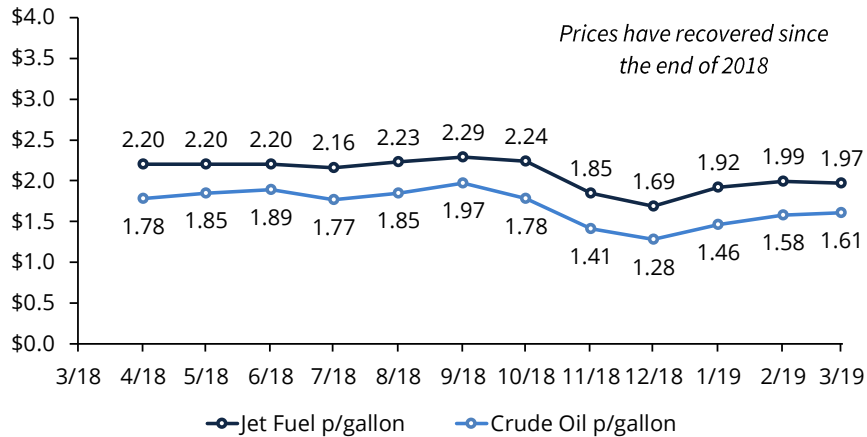
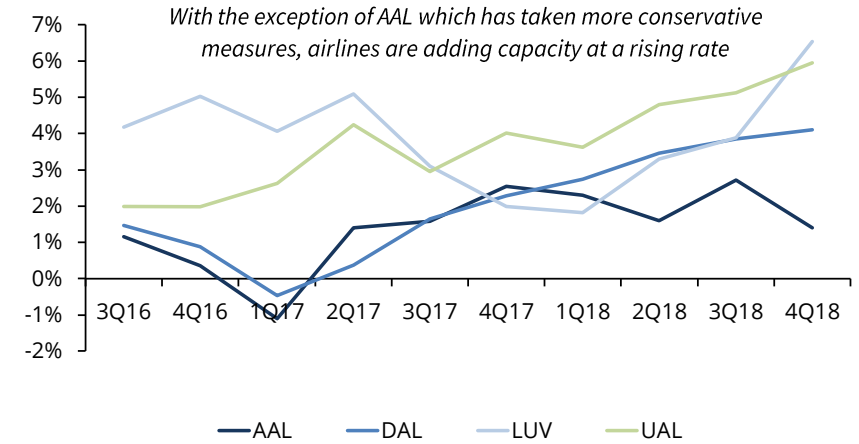


Figure 9: ASM / Capacity YoY Percent Growth



Seasonal CASM, rising fuel costs, and increased capital expenditures will not fully be offset by growing RASM in an economic cycle shift.

Figure 10: Revenue per ASM (in Cents)

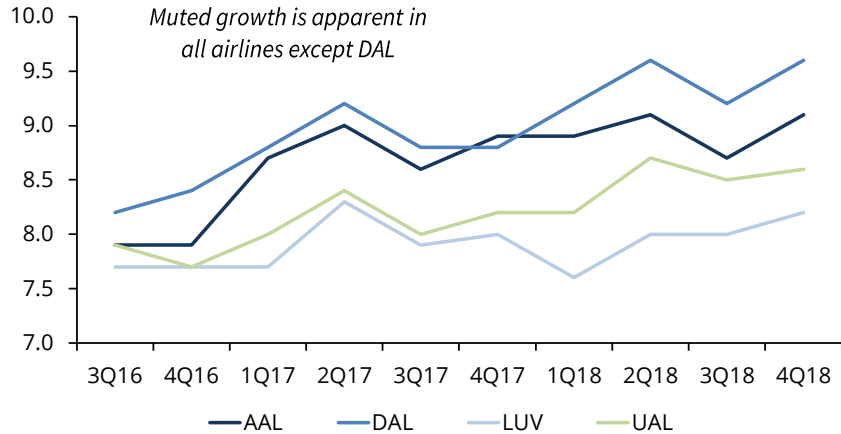


Figure 11: Cost per ASM ex-Fuel (in Cents)

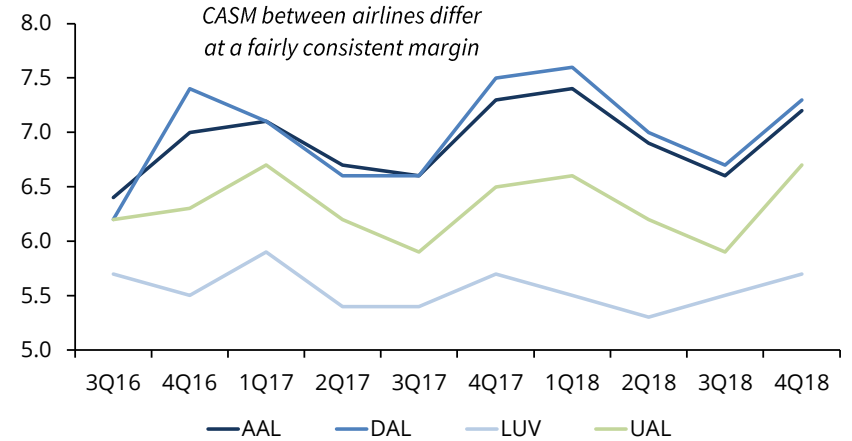


Figure 12: Fuel Cost per ASM (in Cents)

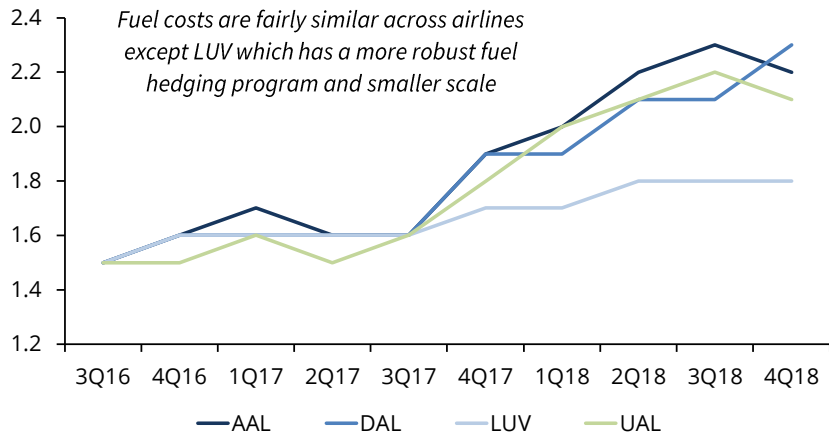
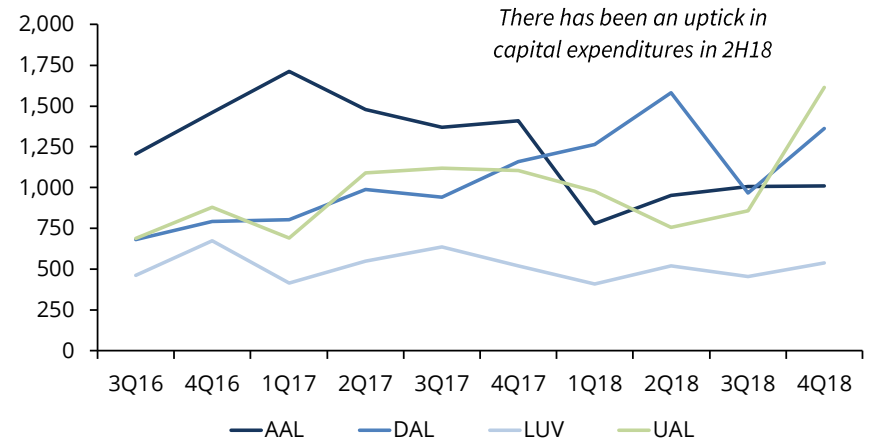


Figure 13: Capex Spending (in \$MM)



Everyone knows airlines will fare poorly in a downcycle and markets will exaggerate the outcome – so how long will performance continue?

Economic Headlines

- Investors have already begun to price in headlines relating to a weakening economy.
- While actual traffic and demand has yet to be materially affected, we believe the publishing of corporate filings and government updates will be the signal.
- Capacity growth overshooting diminishing GDP and consumer spending expectations will catalyze a negative impact on airline securities.

Fuel Pricing

- Crude oil and fuel prices take a significant percent of operating costs.
- EIA expects tapered upward oil price pressures in the next two years based on global inventory builds and rising OPEC spare capacity.
- Commodity strategists believe OPEC's commitment to production, US sanctions on Iran / Venezuela, and overall demand will cause a price surge.
- Fuel headwinds depend on global demand and whether Trump sits still.

Regulation

- The Ethiopian Airlines crash resulted in a global grounding of the 737 Max.
- Although 737 Max planes are a small portion of fleets, airlines are preparing for cancellations.
- Another force majeure event such as a terrorist attack could heighten regulatory scrutiny and bring financial performance to an inflection.
- Lastly, other legislation such as taxes on repatriating foreign funds could also further a bear case.

Other Factors

- Airline seasonality is expected as cash produced in 2Q and 3Q are usually used in 1Q and 4Q, but coupled with other factors, seasonality could exacerbate issues.
- Airlines that depend on debt markets to raise capital to fund their pension liabilities will find it harder to sell issues. Even though the Fed has temporarily softened their stance on rates, the turn of the business cycle will impact cash flow, requiring higher rates on airline debt and further impairing their balance sheets.



Based on our anticipation of downturn, success depends more on trade timing and execution.

| | Long Securities | Short Securities |
|-----------------------------|---|--|
| Long CDS Short Security | <p>Long (IG or HY) CDS (Single Name or Index)</p> <p>Hedging CDS positions with equity shares can sometimes be ineffective due to low correlation depending on the event – if so, traders can just trade in one of the markets. Nobody really uses CDS to insure debt positions; they serve as a proxy for shorting debt.</p> | <p>Short (Equity or Junior Debt Securities)</p> <p>Equity is easier to short than most debt issues. Generally, CDS tend to trail equities and trade similarly when there are no credit specific catalysts. It is worth noting that this pair trade does not constitute a hedge since both products are exposed to the same credit risk.</p> |
| Long Senior Short Junior | <p>Long (EETCs, Bank Loans, Bonds, or Convertibles)</p> <p>While the airlines we covered did not seem to have any convertible or mezzanine financing, there were plenty of senior secured offerings that could be traded. Although EETC liquidity may be limiting, loan / bond or bond / bond pair relative value trades are possible.</p> | <p>Short (Bonds or Equities)</p> <p>The securities for this trade can be from different issuers. Shorting bonds for a one to two year period will be riskier than doing the same for equities, but advancements such as electronic bond trading are constantly reducing the cost of borrowing corporates.</p> |
| Notes | <p>The above lays out general trades that take advantage of capital structure inefficiencies and relative value. A more rigorous and sophisticated quantitative system would use the Merton Model, applying closed-form assumptions to derive formulas linking credit spreads, implied default probability, and equity option volatilities. This could be executed via CDS, swaptions, equity options, and other derivative products. Derivatives can be orders of magnitude removed from their underlying. Due to liquidity risk, simply trading the underlying might be a better alternative.</p> <p>Lastly, we suggest hedging trades using indexes and index options.</p> | |



Below are two example relationships that we believe have value; we recommend looking at similar pairings of securities.

Figure 14: Long AAL 4 5% Short DAL 4 3% Normalized

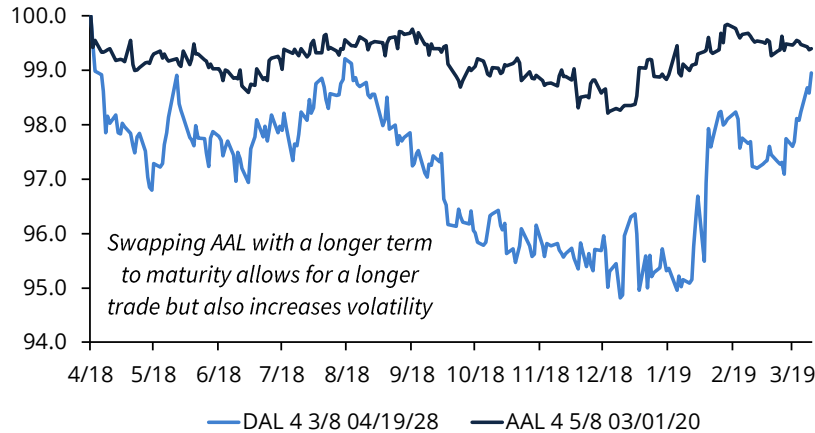


Figure 15: Relative Value Trade Spread

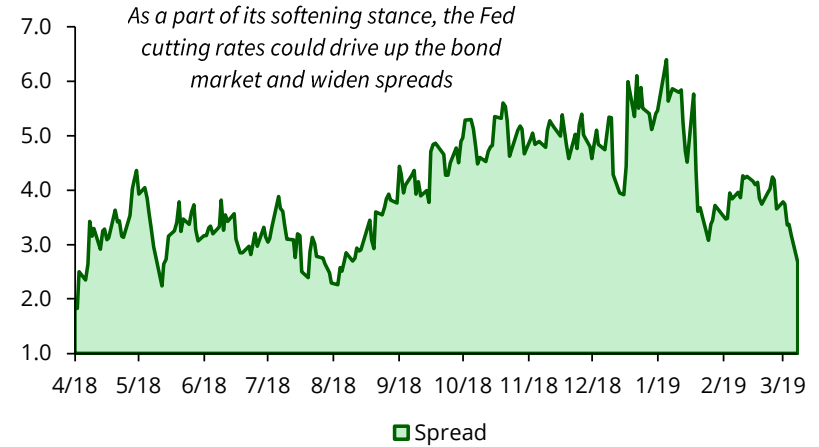


Figure 16: Long AAL 5Y CDS Short AAL Equity Normalized

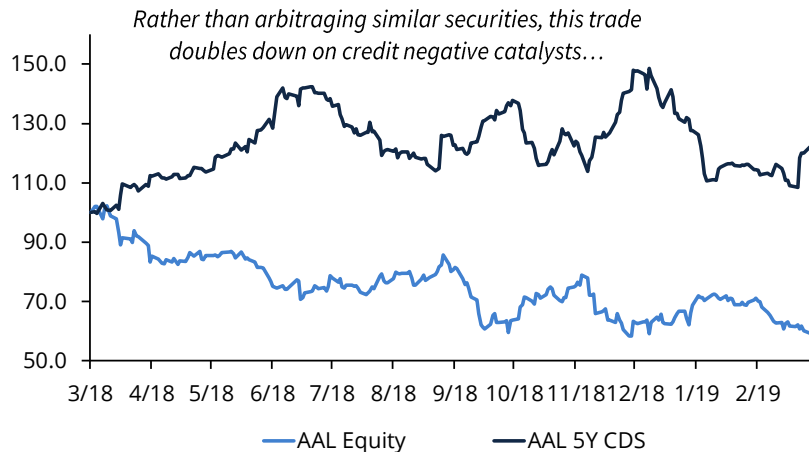
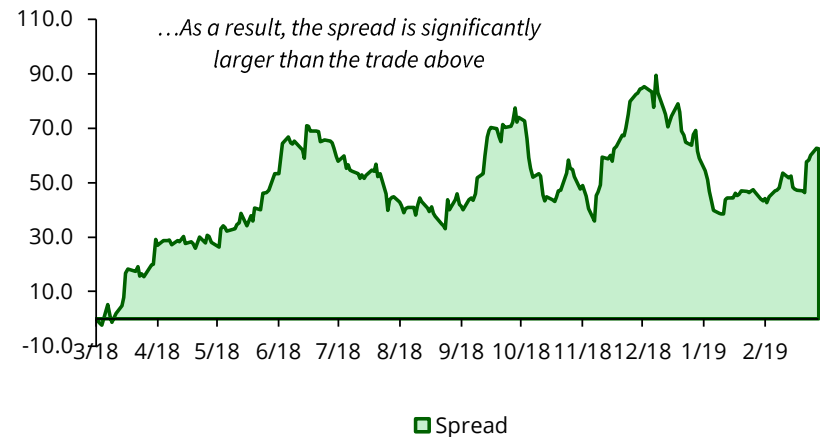


Figure 17: Capital Structure Arbitrage Trade Spread

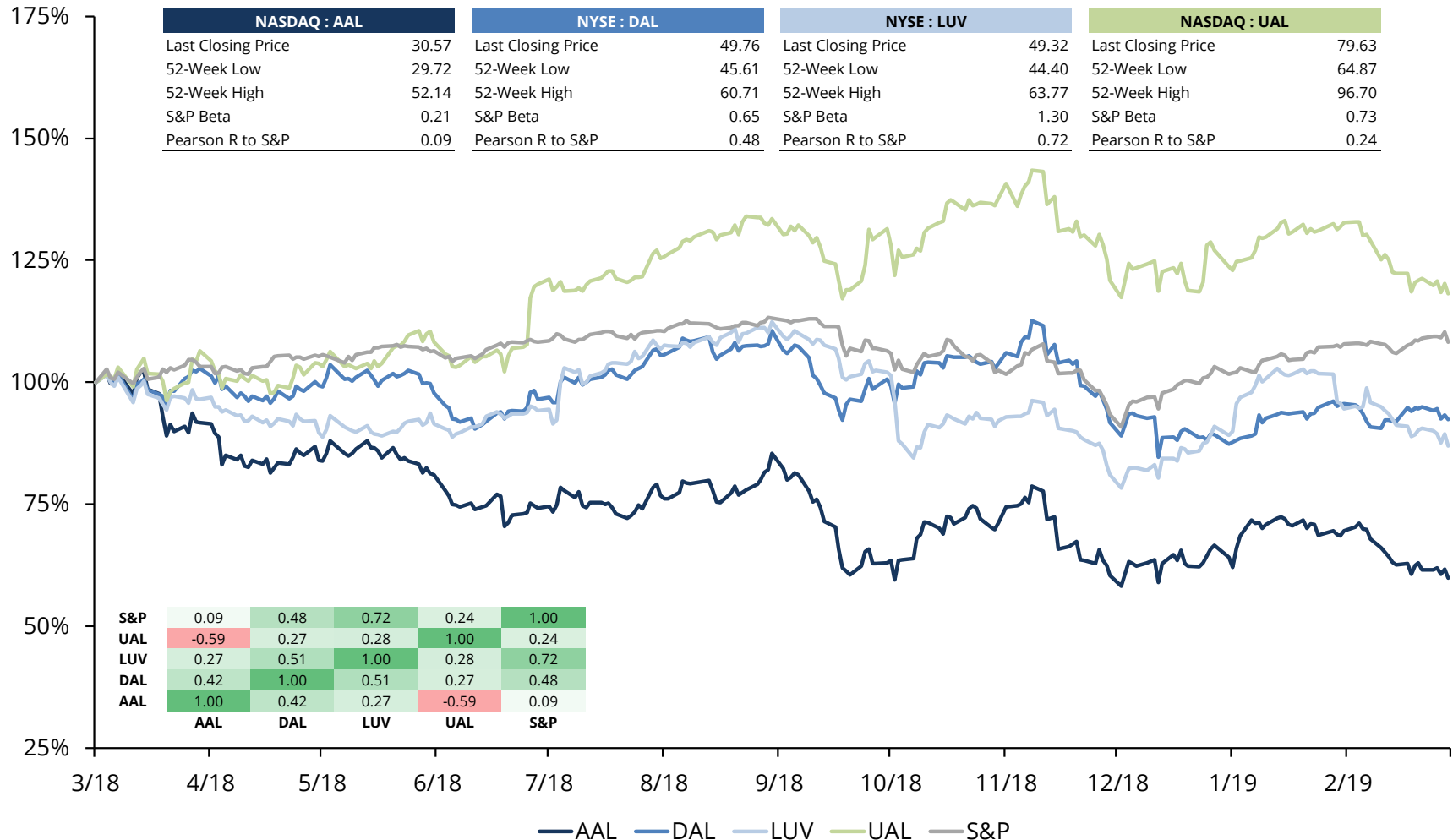


Airline Securities Overview



Airlines have generally underperformed the S&P index and demonstrate relatively low correlation.

Figure 18: Equity Performance & Correlation Matrix



American has the lowest credit ratings of the U.S. airlines we looked at – reflected in its top heavy capital structure and 4.7x secured leverage.

Figure 19: American Airlines Debt Profile

| December 31, 2018 (in \$ millions, except share and per share) | Undrawn Amount | Outstanding Amount | % of Total Cap | EBITDA Multiple | Maturity Date | Interest Rate | Notes |
|---|-------------------|-----------------------|-------------------|--------------------|---------------|-----------------------|--|
| Cash & Equivalents | | 275.0 | | | | | |
| Secured Credit Facilities: | | | | | | | |
| 2013 Replacement Term Loan | - | 1,825.0 | 3.0% | 0.4x | June 2025 | Floating L + 1.75% | Secured by slots, route authorities, and gate leasehold rights used to operate all services between U.S. and South America |
| 2013 Revolving Facility | 1,000.0 | - | 0.0% | 0.0x | October 2023 | Floating L + 2.00% | |
| 2014 Term Loan Facility | - | 1,215.0 | 2.0% | 0.3x | October 2021 | Floating L + 2.00% | Secured by slots, route authorities, and gate leasehold rights used to operate all services between U.S. and EU (including UK) |
| 2014 Revolving Facility | 1,543.0 | - | 0.0% | 0.0x | October 2023 | Floating L + 2.00% | |
| Apr 2016 Term Loan | - | 980.0 | 1.6% | 0.2x | April 2023 | Floating L + 2.00% | Secured by spare parts |
| Apr 2016 Revolving Facility | 300.0 | - | 0.0% | 0.0x | October 2023 | Floating L + 2.00% | |
| Dec 2016 Term Loan | - | 1,225.0 | 2.0% | 0.3x | December 2023 | Floating L + 2.00% | Secured by DCA / LGA slots, simulators, and leasehold rights |
| Other Secured Financings: | | | | | | | |
| Aircraft EETC | - | 11,648.0 | 18.9% | 2.4x | 2019 to 2029 | Fixed 3.00 to 9.01% | Includes 2017-2 EETCs and 2012-2C(R) EETCs for aircrafts |
| Equipment Loans and Other Notes Payable | - | 5,060.0 | 8.2% | 1.1x | 2019 to 2030 | Fixed 2.34 to 8.48% | For aircraft and pre-delivery purchase deposits |
| Special Facility Revenue Bonds | - | 798.0 | 1.3% | 0.2x | 2019 to 2031 | Fixed 5.00 to 8.00% | |
| Total Secured Debt | | 22,751.0 | 37.0% | 4.7x | | | |
| Unsecured Senior Notes: | | | | | | | |
| 5.500% Senior Unsecured Notes | - | 750.0 | 1.2% | 0.2x | October 2019 | Fixed 5.500% | Used for GCP |
| 4.625% Senior Unsecured Notes | - | 500.0 | 0.8% | 0.1x | March 2020 | Fixed 4.625% | Used for GCP |
| Total Secured and Unsecured Debt | 2,843.0 | 24,001.0 | 39.0% | 5.0x | | | |
| Unamortized Premium and Debt Issue Cost | | (222.0) | | | | | |
| Total Debt | | 23,779.0 | 38.7% | 4.9x | | | |
| Net Debt | | 23,504.0 | | 4.9x | | | |
| Market Capitalization | | 14,235.2 | 23.1% | 3.0x | | | |
| Total Capitalization | | 61,518.2 | 100.0% | | | | |
| LTM EBITDA | | | | \$4,815.0 | | | |

Like most airlines, American uses secured financing for its aircrafts which inflates its secured leverage.

American's parent company AMR filed for bankruptcy in November 2011. Being the last major legacy airline to file for Chapter 11 left it less nimble than its competitors but allowed United to drastically reduce its pension obligations hosted under the Pension Benefit Guaranty Corporation, a U.S. government agency. Instead of terminating its pension like other airlines, American froze their plan, buying a little time.

After merging with US Airways Group, AMR survived as a wholly-owned subsidiary of AAG. Debt is issued by American which is guaranteed by AAG.



Delta reached IG status from all three agencies in September 2017 and has taken on new unsecured debt (at close to no risk to creditors).

Figure 20: Delta Air Lines Debt Profile

| December 31, 2018 (in \$ millions, except share and per share) | Undrawn Amount | Outstanding Amount | % of Total Cap | EBITDA Multiple | Maturity Date | Interest Rate | Notes |
|---|-------------------|-----------------------|-------------------|--------------------|--------------------|-----------------------|--|
| Cash & Equivalents | | 1,565.0 | | | | | |
| Secured Aircraft Financing: | | | | | | | |
| Certificates | - | 1,837.0 | 3.6% | 0.2x | 2018 to 2027 | Fixed 3.63 to 8.02% | Loans secured by 10 aircraft |
| Notes | - | 1,787.0 | 3.5% | 0.2x | 2018 to 2026 | Fixed 2.75 to 6.54% | |
| Other Secured Financings: | | | | | | | |
| Other Financing | - | 251.0 | 0.5% | 0.0x | 2019 to 2030 | Fixed 1.81 to 8.75% | Debt secured by AR and real estate |
| Total Secured Debt | | 3,875.0 | 7.5% | 0.5x | | | |
| 2018 Unsecured Senior Notes: | | | | | | | |
| 3.400% Senior Unsecured Notes | - | 600.0 | 1.2% | 0.1x | April 19, 2021 | Fixed 3.400% | Used to repay Pacific and 2015 Term Loans and for GCP |
| 3.800% Senior Unsecured Notes | - | 500.0 | 1.0% | 0.1x | April 19, 2023 | Fixed 3.800% | |
| 4.375% Senior Unsecured Notes | - | 500.0 | 1.0% | 0.1x | April 19, 2028 | Fixed 4.375% | |
| 2018 Unsecured Revolving Credit Facility: | | | | | | | |
| 3yr Revolving Credit Facility | 1,325.0 | - | 0.0% | 0.0x | 2021 | Floating Variable | Used to replace Pacific and 2015 Revolving Credit Facilities |
| 5yr Revolving Credit Facility | 1,325.0 | - | 0.0% | 0.0x | 2023 | Floating Variable | |
| NYTDC Special Facilities Revenue Bonds: | | | | | | | |
| Series 2018 Serial Bonds | - | 1,117.7 | 2.2% | 0.1x | January 1, 2022-34 | Fixed 5.000% | Used for renovating LaGuardia |
| Series 2018 Term Bonds | - | 265.8 | 0.5% | 0.0x | January 1, 2036 | Fixed 4.000% | |
| Unsecured Notes: | | | | | | | |
| 2.875% Senior Unsecured Notes | - | 1,000.0 | 1.9% | 0.1x | March 15, 2020 | Fixed 2.875% | Used for Fund Defined Benefits Plan |
| 3.625% Senior Unsecured Notes | - | 1,000.0 | 1.9% | 0.1x | March 15, 2022 | Fixed 3.625% | |
| 2.600% Senior Unsecured Notes | - | 450.0 | 0.9% | 0.1x | December 4, 2020 | Fixed 2.600% | Used for GCP |
| Other Revolving Credit Facilities: | | | | | | | |
| Revolving Credit Facilities | 380.0 | - | 0.0% | 0.0x | 2019 to 2021 | Floating Variable | |
| Total Secured and Unsecured Debt | 3,030.0 | 9,308.5 | 18.0% | 1.2x | | | |
| Unamortized Premium and Debt Issue Cost | | 60.0 | | | | | |
| Total Debt | | 9,368.5 | 18.1% | 1.2x | | | |
| Net Debt | | 7,803.5 | | 1.0x | | | |
| Market Capitalization | | 34,533.4 | 66.8% | 4.5x | | | |
| Total Capitalization | | 51,705.4 | 100.0% | | | | |
| LTM EBITDA | | | | \$7,593.0 | | | |

Delta bankrupted in 2005 which has since left it with an accruing pension funding obligation. Delta's recent debt issuances have gone towards mandatory minimum funding requirements.



Southwest has a well-maintained liquidity and manageable funded debt, making it the most credit positive American airline.

Figure 21: Southwest Airlines Debt Profile

| December 31, 2018 (in \$ millions, except share and per share) | Undrawn Amount | Outstanding Amount | % of Total Cap | EBITDA Multiple | Maturity Date | Interest Rate | Notes |
|---|-------------------|-----------------------|-------------------|--------------------|------------------|-----------------------|---|
| Cash & Equivalents | | 1,854.0 | | | | | |
| Secured Credit Facilities: | | | | | | | |
| Term Loan Agreement | - | 23.0 | 0.1% | 0.0x | May 2019 | Fixed 6.315% | Secured by 14 737-700s, L + 3.30% to fixed rate swap |
| Term Loan Agreement | - | 10.0 | 0.0% | 0.0x | July 2019 | Fixed 4.840% | Secured by five 737-700s, one prepaid with \$24MM |
| Term Loan Agreement | - | 187.0 | 0.6% | 0.0x | May 9, 2020 | Fixed 5.223% | Secured by 21 1st lien 737-700s, L + 3.30% to fixed rate swap |
| Term Loan Agreement | - | 197.0 | 0.6% | 0.0x | October 31, 2026 | Floating L + 1.10% | Secured by seven 737-800 aircraft mortgages |
| Other Secured Financings: | | | | | | | |
| 737 Aircraft Notes | - | 67.0 | 0.2% | 0.0x | 2019 to 2020 | Floating Variable | Secured by nine 737 first mortgages, portion fixed rate swapped |
| Pass Through Certificates | - | 250.0 | 0.8% | 0.1x | August 1, 2022 | Fixed 6.15 to 6.65% | Secured by 16 737-700 mortgages, notes hedged |
| Total Secured Debt | | 734.0 | 2.2% | 0.2x | | | |
| Unsecured Senior Notes: | | | | | | | |
| 2.750% Senior Unsecured Notes | - | 300.0 | 0.9% | 0.1x | November 2019 | Floating Variable | 2.75% fixed-to-floating swap |
| 2.650% Senior Unsecured Notes | - | 492.0 | 1.5% | 0.1x | November 2020 | Floating Variable | 2.65% fixed-to-floating swap |
| 2.750% Senior Unsecured Notes | - | 300.0 | 0.9% | 0.1x | November 2022 | Fixed 2.750% | |
| 3.000% Senior Unsecured Notes | - | 300.0 | 0.9% | 0.1x | November 2026 | Fixed 3.000% | |
| 3.450% Senior Unsecured Notes | - | 300.0 | 0.9% | 0.1x | November 2027 | Fixed 3.450% | |
| Other Unsecured Financings: | | | | | | | |
| Unsecured Revolving Credit Facility | 1,000.0 | - | 0.0% | 0.0x | August 1, 2022 | Floating L + 1.00% | Accord to \$1.5BN, minimum coverage covenant |
| 7.375% Senior Unsecured Debentures | - | 125.0 | 0.4% | 0.0x | March 1, 2027 | Fixed 7.375% | Redeemable at any time |
| Capital Leases | - | 845.0 | 2.5% | 0.2x | | | |
| Total Secured and Unsecured Debt | 1,000.0 | 3,396.0 | 10.2% | 0.8x | | | |
| Unamortized Premium and Debt Issue Cost | | (19.0) | | | | | |
| Total Debt | | 3,377.0 | 10.2% | 0.8x | | | |
| Net Debt | | 1,523.0 | | 0.3x | | | |
| Market Capitalization | | 28,309.7 | 85.2% | 6.4x | | | |
| Total Capitalization | | 33,209.7 | 100.0% | | | | |
| LTM EBITDA | | | | \$4,407.0 | | | |

It was funny to note that the fixed-to-floating interest rate swap agreements on Southwest's closest maturities resulted in 2.75% becoming an average floating rate of 3.40% and 2.65% to 3.58%. While not a major problem (Southwest has a \$1.8BN cash balance), it appears the counterparty on the swap had a better credit strategist.

Also on the cash balance, the net debt amount is less than half total debt.

Enhanced Equipment Trust Certificates take up a significant amount of United's secured debt and is backed by the fleet they finance.

Figure 22: United Airlines Debt Profile

| December 31, 2018 (in \$ millions, except share and per share) | Undrawn Amount | Outstanding Amount | % of Total Cap | EBITDA Multiple | Maturity Date | Interest Rate | Notes |
|---|-------------------|-----------------------|-------------------|--------------------|------------------|-----------------------|--|
| Cash & Equivalents | | 1,694.0 | | | | | |
| Secured Credit Facilities: | | | | | | | |
| Term Loan | - | 1,474.0 | 3.1% | 0.3x | April 1, 2024 | Floating L + 1.75% | Rate can be (alt + 0.75%), 0.25% principal paid back quarterly |
| Revolving Credit Facility | 2,000.0 | - | 0.0% | 0.0x | April 1, 2022 | Floating L + 2.25% | (alt + 1.25%), commitment fee is 0.75% / year on undrawn |
| Other Secured Financings: | | | | | | | |
| EETC Notes Payable | - | 8,811.0 | 18.7% | 1.6x | 2030 | Fixed 0.00 to 9.52% | Secured by United's aircrafts |
| EETC Notes Payable | - | 2,051.0 | 4.3% | 0.4x | 2030 | Floating Variable | L + 1.05 to 1.75%, secured by United's aircrafts |
| Total Secured Debt | | 12,336.0 | 26.1% | 2.2x | | | |
| Unsecured Senior Notes: | | | | | | | |
| 6.375% Senior Unsecured Notes | - | 300.0 | 0.6% | 0.1x | June 1, 2018 | Fixed 6.375% | UAL issued, United guarantor |
| 4.250% Senior Unsecured Notes | - | 400.0 | 0.8% | 0.1x | October 1, 2022 | Fixed 4.250% | UAL issued, United guarantor, CoC 101% |
| 5.000% Senior Unsecured Notes | - | 300.0 | 0.6% | 0.1x | February 1, 2024 | Fixed 5.000% | UAL issued, United guarantor, CoC 101% |
| Other Unsecured Financings: | | | | | | | |
| Other | - | 300.0 | 0.6% | 0.1x | August 1, 2022 | Floating L + 1.00% | Accordion allows increase to \$1.5BN, min. coverage covenant |
| Total Secured and Unsecured Debt | 2,000.0 | 13,636.0 | 28.9% | 2.5x | | | |
| Unamortized Premium and Debt Issue Cost | | (191.0) | | | | | |
| Total Debt | | 13,445.0 | 28.5% | 2.4x | | | |
| Net Debt | | 11,751.0 | | 2.1x | | | |
| Market Capitalization | | 22,033.6 | 46.7% | 4.0x | | | |
| Total Capitalization | | 47,229.6 | 100.0% | | | | |
| LTM EBITDA | | | | \$5,532.0 | | | |

United Airlines filed for bankruptcy in December 2002 and decided to eliminate its pension, giving the rights to PBGC in return for equity (at the detriment of United's workers).

UAL is the issuer of all unsecured senior notes while United is a guarantor.



Appendix



| Date | News | |
|----------------------------------|--------------------------------|---|
| 09/10/2011 | Forbes | PBGC Pension Termination: A Worker's Perspective |
| 11/29/2011 | NYT | American Airlines Parent Files for Bankruptcy |
| 01/17/2019 | Cowen | United Continental Holdings Company Update |
| 01/25/2019 | Imperial Capital | American Airlines Group 4Q18 Recap |
| 03/12/2019 | EIA | Short-Term Energy Outlook |
| 03/24/2019 | CNBC | Here's the one 'big, looming' threat facing the oil rally, commodity expert says |
| 03/24/2019 | CNBC | American Airlines is cancelling 90 flights a day as Boeing 737 Max remains grounded |
| 03/25/2019 | CNBC | Airlines warn of cancellations as Boeing readies 737 Max software fix |
| 03/25/2019 | CNBC | Bond market says not only is a recession coming, but the Fed will cut interest rates to stop it |
| Title | Source | |
| U.S. Airline Datasets | Airlines for America | http://airlines.org/ |
| Airline Sales Statistics | ARC | https://www2.arccorp.com/articles-trends/sales-statistics/ |
| Market for Borrowing Bonds | Journal of Financial Economics | https://economics.mit.edu/files/9411 |
| Moody's | Moody's | https://www.moodys.com/ |
| SEC EDGAR | SEC EDGAR | https://www.sec.gov/edgar/searchedgar/companysearch.html |
| S&P LCD | S&P LCD | https://www.lcdcomps.com/lcd/n/home.html |
| Daily Treasury Yield Curve Rates | US Treasury | https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/default.aspx |
| Managing Hedge Fund Risk | Wiley Finance | |
| Yahoo | Yahoo | https://finance.yahoo.com/ |

Important Disclosures

The information and opinions in this report were prepared by Charon Special Situations Group and its members (collectively known as "CSSG" or "Charon SSG"). Though the information herein is believed to be reliable and has been obtained from public sources believed to be reliable, CSSG makes no representation as to its accuracy or completeness. Hyperlinks to third-party websites in this report are provided for reader convenience only. CSSG neither endorses the content nor is responsible for the accuracy or security controls of these websites.

Analyst Certification

The views expressed in this report accurately reflect the personal views of the analyst(s) about the subject issuer and the securities of the issuer. In addition, the analyst(s) has not and will not receive any compensation for providing a specific recommendation or view in this report.



Charon Special Situations Group

Charon Special Situations Group (CSSG or Charon SSG) is an independent investment research firm focused on covering quantitative and event-driven strategies for institutional investors. Comprised of undergraduate students from the Georgia Institute of Technology, our team works to produce the highest quality investment research and share our publications with financial professionals in Atlanta and New York.

Hyunjae (Brian) Lee, Investment Analyst

Brian is an incoming Global Markets Summer Analyst in RBC Capital Markets' FICC Origination division with previous experiences in leveraged finance and credit research at SunTrust Robinson Humphrey. Brian currently works in private wealth management at Morgan Stanley and studies computer science and finance at the Georgia Institute of Technology.

Anthony D'Achille, Quantitative Analyst

Anthony is an incoming software engineering intern at HubSpot. He currently works in Home Depot's Supply Chain team on leveraging statistical methods and machine learning for load forecasting and has previous experience in full-stack web development. Anthony studies computer science at the Georgia Institute of Technology.

Contact

LinkedIn <https://www.linkedin.com/company/cssg/>
Website <https://www.charonssg.com/>
Email charonssg@gmail.com

