

# **Assessment of ASU 2011 vs. Commercial Markets Pricing in 2019\***

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# Executive Summary

- **ASU pricing vs. bank loan market:** According to the 5<sup>th</sup> Bank Bid Exercise (BBE 5), the current ASU pricing (minimum premium rate plus margin benchmark) is materially more expensive than commercial bank loan pricing. For risk categories 1-6 the ASU pricing is 74 basis points per annum more expensive than bank pricing on average across risk categories 1-6 and average collateral (vs. 53 bps more expensive in BBE 4). For risk categories 7-8 the ASU pricing is 33 bps more expensive than bank pricing for average collateral (vs. 14 bps less expensive in BBE 4), but commercial bank financing availability remains limited in this segment of the market, as evidenced by only 4 bidders in BBE 5 making bids for loans to airlines in risk categories 7-8. Over time from 2012 (BBE 1) to 2019 (BBE 5) bank loan pricing decreased at a faster rate than the ASU pricing.
- **ASU pricing vs. capital markets:** EETC pricing continues to stay less expensive on average than the ASU pricing. Average advantage of EETC vs ASU pricing across all six EETC issues from December 2017 to July 2019 is 32 bps (vs 21 bps across EETC issues in 2015 covered in our previous submission). Specifically, five out of six deals had better pricing than ASU: Air Canada 17-1 and 18-1, United 18-1, British Airways 18-1 and Delta 19-1 EETCs maintained advantages of 43, 71, 46, 17 and 35 bps, respectively, over the corresponding ASU pricing. For United 19-1 ASU pricing holds an advantage of 13 bps over the pricing achieved in this EETC issue. (This quantitative analysis is conservative as it is based on LTVs derived from publicly available aircraft appraisals while ASU LTVs are based on net purchase prices.) Of note is a growing market for unsecured airline bonds, with a wide spectrum of airline issuers and improving pricing. Investment grade airlines are typically able to achieve unsecured bond pricing lower than the ASU secured pricing for Category 1.

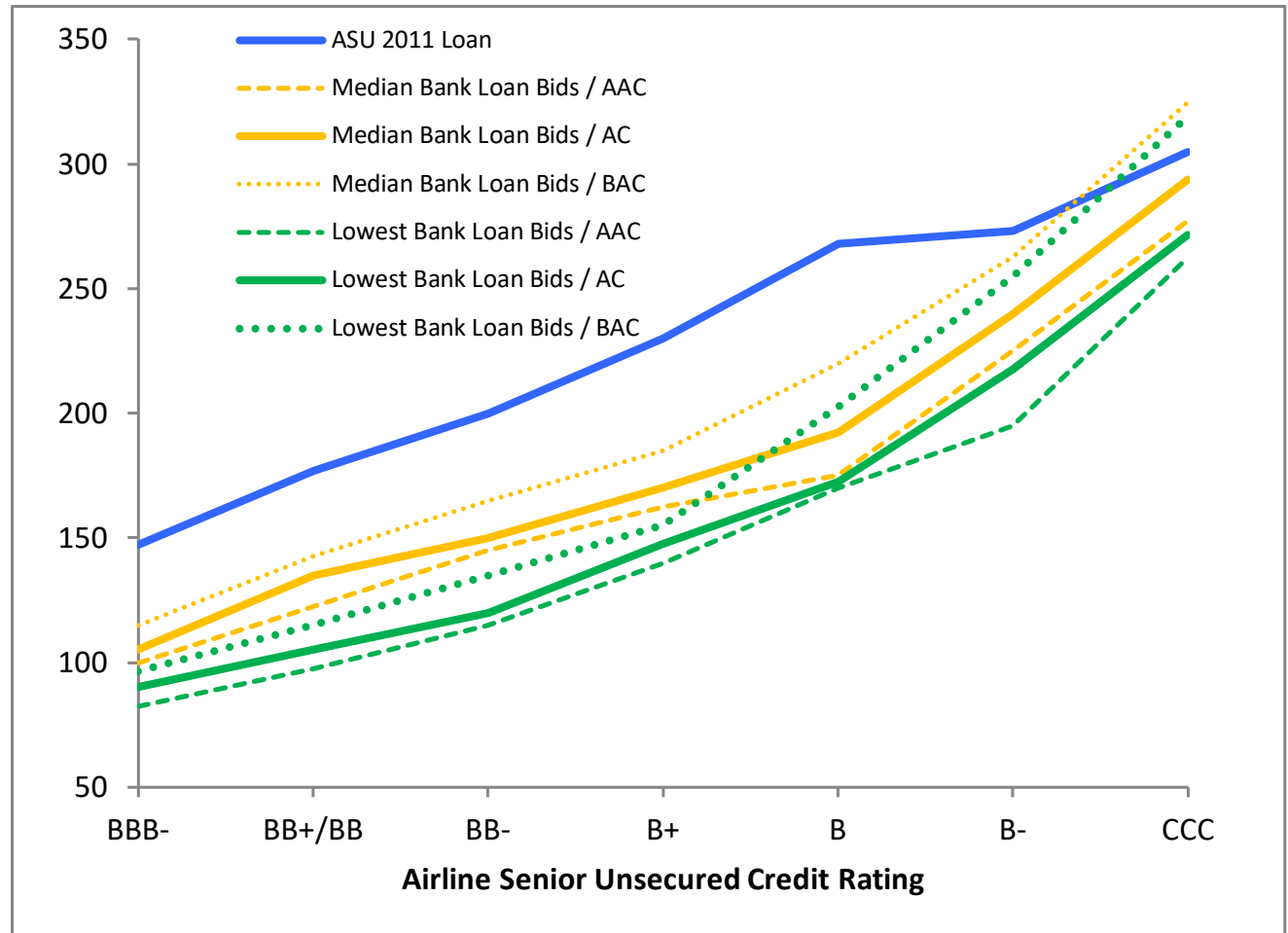
# ASU 2011 vs. BBE 5

➤ **ASU 2011 ECA supported Loan Cost (bps per annum):**  
ASU 2011 MPR (Q3 2019) plus September 2019 Margin Benchmark of 45 bps.

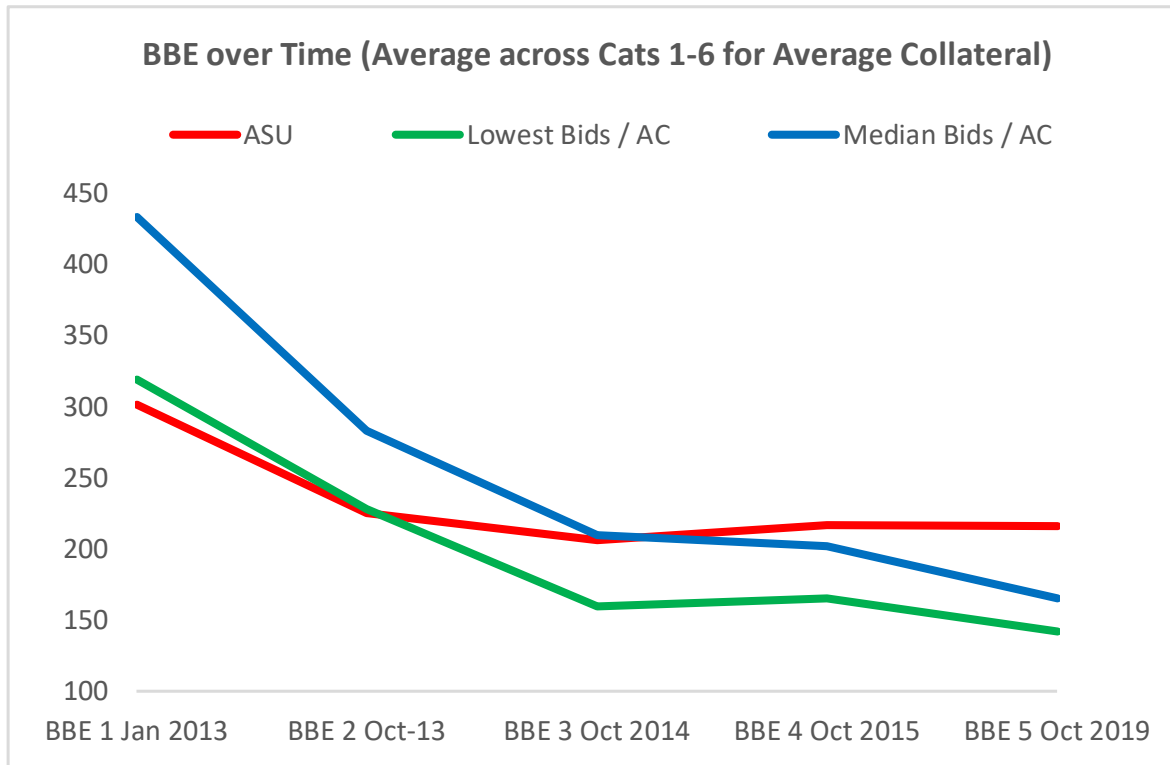
➤ **Median Bank Loan Bids / AAC, AC, BA:** Median Bids with Above Average Collateral (AAC), Average Collateral (AC), Below Average Collateral (BA)

➤ **Lowest Bank Loan Bids / AAC, AC, BA:** Average of the Two Lowest Bank Bids in Each Category

➤ **Both lowest (green) and median (orange) bank bids are materially lower than the ASU curve (solid blue) except for the lowest rating categories 7 and 8 and below average collateral.**

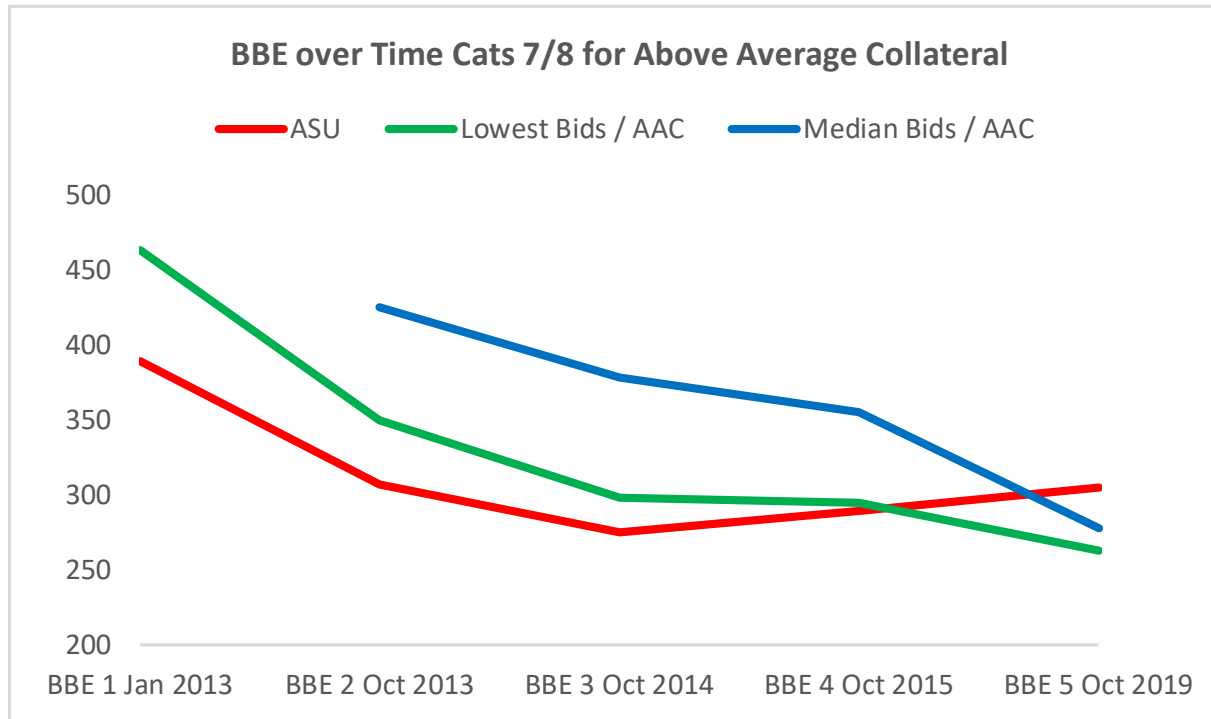


# BBE vs ASU Over Time for Risk Categories 1-6



- BBE 1: lowest bids slightly higher than ASU / median bids materially higher.
- BBE 2: lowest bids essentially match ASU / median bids still materially higher.
- BBE 3: lowest bids materially lower than ASU / median bids essentially match ASU.
- BBE 4: lowest bids materially lower than ASU / median bids slightly lower than ASU.
- **BBE 5: both lowest and median bids materially lower than ASU.**
- Risk Categories 1-6 included in this over time analysis (average across Cats 1-6, AC = average collateral).
- Bank loan spreads declined at a faster rate than the ASU pricing.

## BBE vs ASU Over Time for Risk Categories 7-8



- We have limited bank pricing data for Cats 7-8 to make broad inferences for these risk categories. In BBE 5, only 4 out of 10 exercise bidders made bids for loans with above average and average collateral to airlines in Risk Categories 7-8 (3 bids for loans with below average collateral). While it appears that the bank bids are now below the ASU pricing for these risk categories for above average and average collateral, commercial bank financing availability remains limited in this segment of the market. Given the small number of bids these figures may not be fully representative.
- This chart plots the average of two lowest bids and the median bid for loans with above average collateral to Cats 7-8 to be consistent with the charts presented in the earlier BBE, where we did not have sufficient data for average and below average collateral to construct a similar chart.

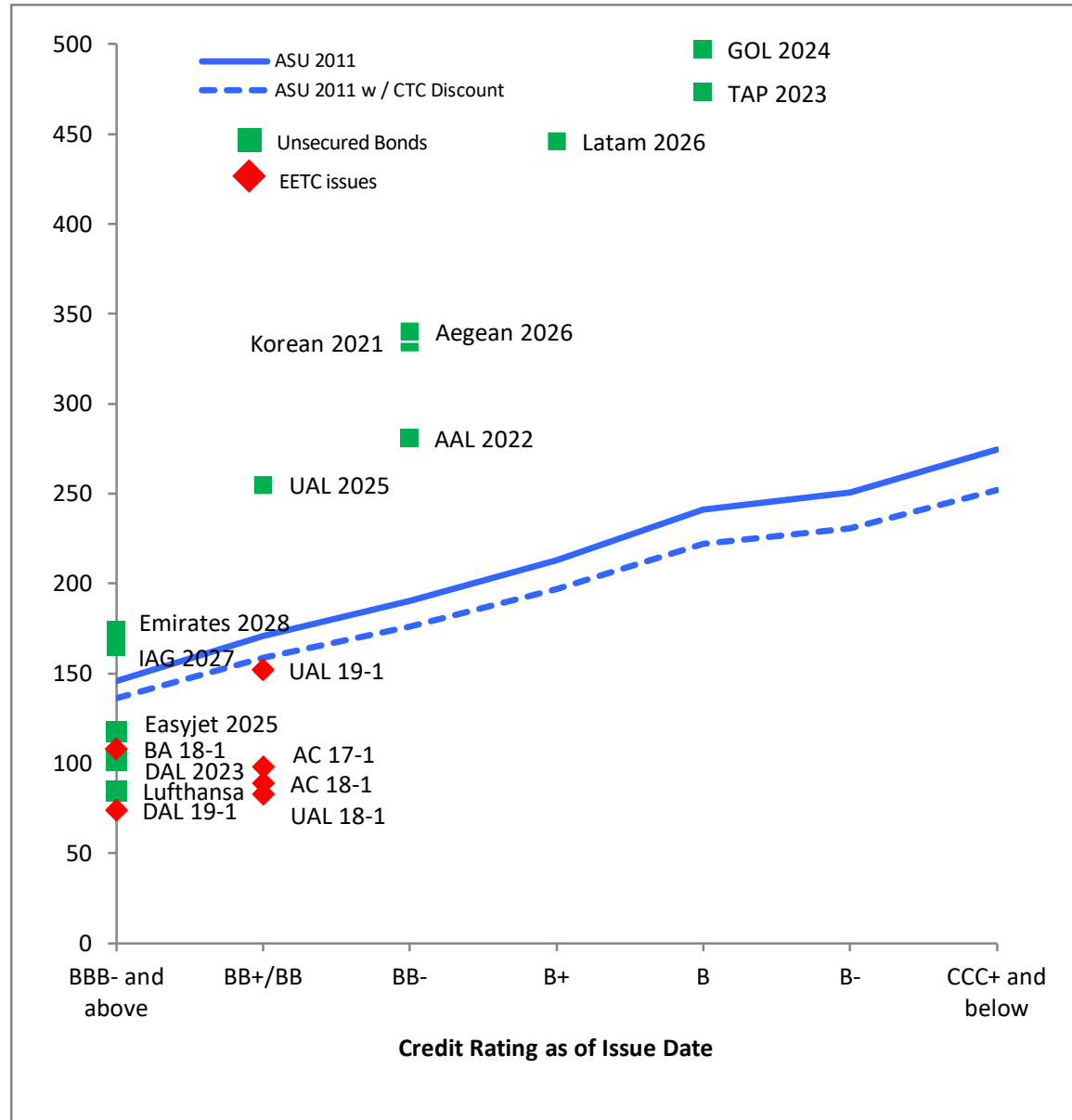
# Capital Markets in 2018-2019: EETCs and Unsecured Bonds

➤ **ASU 2011:** Solid blue line ASU 2011 MPRs (averages from Q4 2017 through Q3 2019) plus Margin Benchmark (average over the same period) in bps per annum. Dashed blue line with CTC discount.

➤ **Unsecured bonds Dec 2017 through July 2019 (green squares):** spreads over interpolated mid-swaps on the issue date.

➤ **EETC Dec 2017 through July 2019 (red diamonds):** Composite spreads over interpolated mid-swaps matched to WAL for AC 2017-1, 2018-1, UAL 2018-1, 2019-1, BA 2018-1, DAL 2019-1 at issuance. Not adjusted for LTV differences (see next page for adjustments).

➤ **Ratings:** For EETCs, the ratings are airline's corporate family ratings (CFR). For unsecured issues, ratings are unsecured bond ratings as of the issue date. Notes: 1) Some ratings since changed. 2) When Moody's and S&P disagree on the rating, we choose the higher rating to produce a more conservative comparison with the ASU. 3) Aegean, Korean, TAP are unrated. For the purpose of this chart we place them in ASU Risk Categories based on their market spread at issuance relative to rated issues.



# ASU vs EETC: Comparison with LTV adjustments

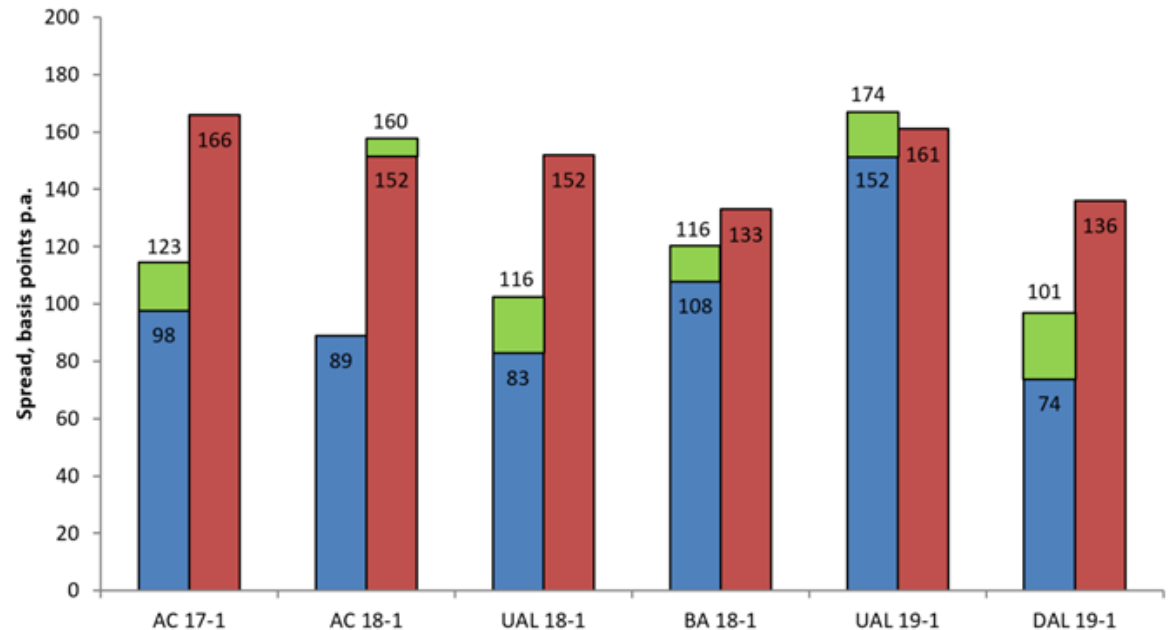
➤ **ASU 2011: Red bars** show the cost of ECA financing for the same risk category as the airline issuing EETC on the date of EETC issue (MPR + margin benchmark).

➤ **EETC: Blue bars** show composite spreads across all tranches issued over swap rates (matched to WAL) calculated at issuance.

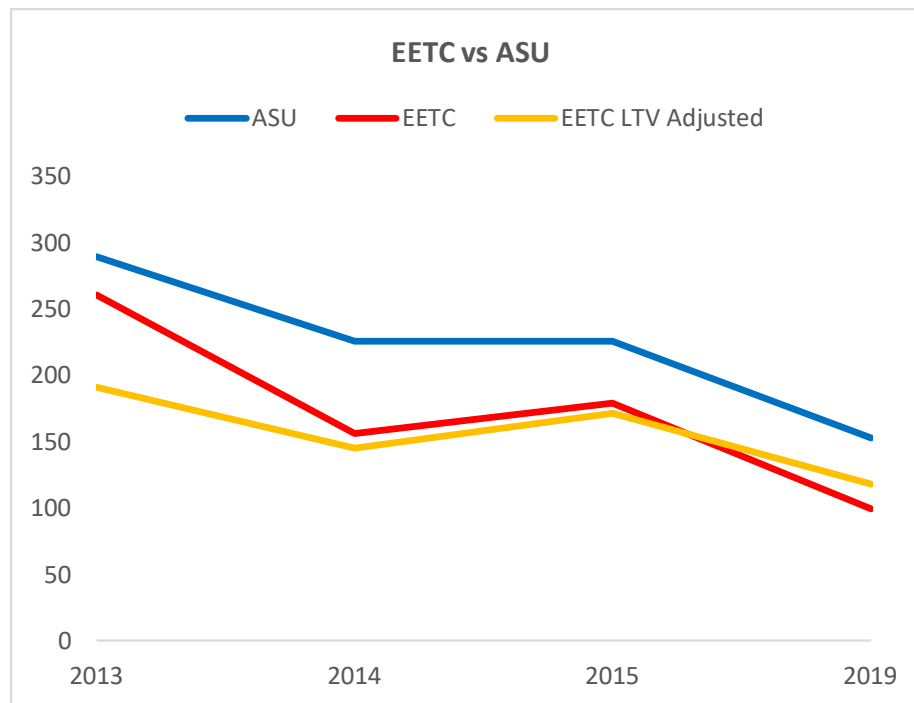
➤ **LTV Adjustments: Green bars** show cost of additional financing at the unsecured bond rate to top off to the LTV that is the greater of the EETC and the ASU LTVs. LTV calculations are based on JP Morgan Master Model aircraft appraisals. For AC 17-1, UAL 18-1, 19-1, BA 18-1, DAL 19-1 EETC LTVs were lower than the ASU LTV. For these comparisons the unsecured top-offs are added to the EETC financing to arrive at the composite EETC + unsecured financing with the same LTV as the ASU terms. For AC 18-1 LTV was higher than the ASU LTV. For this comparison the unsecured top-off was added to the ASU financing to arrive at the composite ASU + unsecured financing with the same LTV as ASU.

➤ **Caveat:** LTV adjustments presented in this chart are *hypothetical* and *overly conservative* as they are based on JP Morgan appraisals. The real comparison with the ASU should be based on *net purchase prices*. The conservatism of this analysis stems from the fact that such appraisals have often been higher than net purchase prices of new aircraft.

➤ **Summary: Advantages of EETC vs ASU for AC 17-1, AC 18-1, UAL 18-1, BA 18-1 and DAL 19-1 are 43, 71, 46, 17 and 35 bps, respectively. For UAL 19-1 ASU pricing holds an advantage of 13 bps over the pricing achieved in this EETC. Average advantage of EETC vs ASU across all 6 deals is 32 bps.**



# EETC vs ASU Over Time (US and Canadian Airlines)



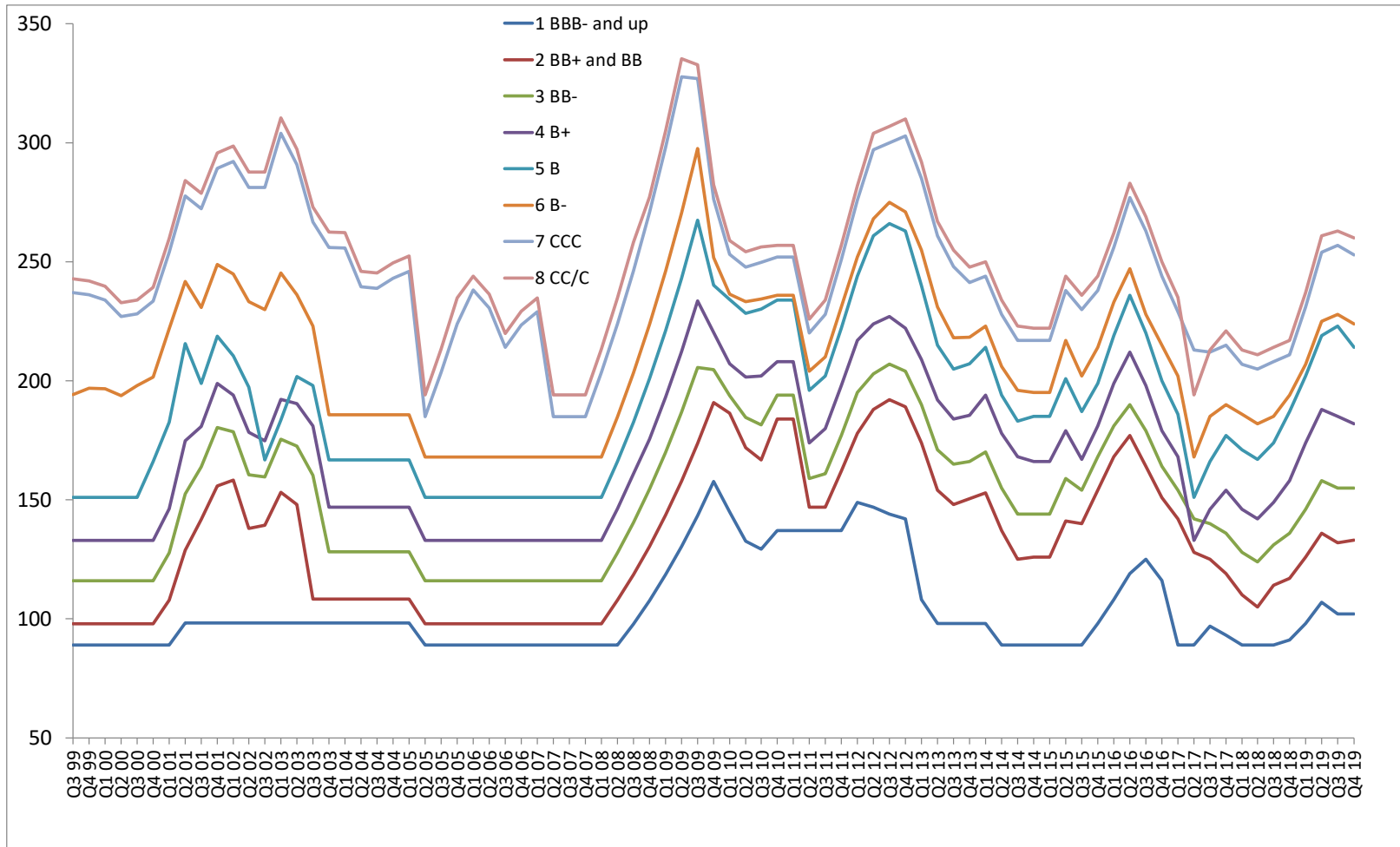
- **ASU:** For each year average cost of ECA financing under ASU for airlines in risk categories corresponding to credit ratings of airlines issuing EETCs in that year (MPR with CTC discount plus Margin Benchmark).
- **EETC:** Average composite spreads (across all tranches issued) over interpolated mid-swaps matched to WAL in basis points per annum across all EETC issues collateralized by new or predominantly new aircraft by US and Canadian Airlines.
- **EETC LTV Adjusted:** spreads adjusted for LTV differences with ASU terms. LTV adjustments based on JP Morgan current market value aircraft appraisals. Caveat: LTV adjustments presented are hypothetical as they are based on JP Morgan appraisals. The real comparison with the ASU should be based on *net purchase prices*.
- **EETC spreads of US and Canadian airlines stayed consistently under the ASU pricing over time.**



# Data and Details

- **Review of ASU 2011 Pricing: 2019 Update**
- **ASU 2011 vs. Commercial Markets Comparison: 5<sup>th</sup> Bank Bid Exercise (BBE 5)**
- **ASU 2011 vs. Commercial Markets Comparison: Dec. 2017 to July 2019 EETC and Unsecured Airline Bond Issuance**

# ASU 2011 MPR Adjustments: 2019 Update



- Historical simulation of ASU 2011 MPRs from Q3 1999 to Q4 2010 conducted by Dr. Linetsky. Actual MPR adjustments from Q1 2011 to Q4 2019 (from historical MPRs file on the OECD ASU web site).
- **Volatility over the full market cycle:** the range from the lowest MPRs (in 2007 and again re-visited in early 2018) to the highest (financial crisis of 2008/9) has been approximately **70% to 80% of MPR**.

# ASU / Commercial Markets Comparison:

## 5<sup>th</sup> ASU / Bank Bid Exercise

- In September 2019 Dr. Linetsky conducted a **5<sup>th</sup> Bank Bid Exercise**.
- The **Bid Chart** requested bids on loans to ASU Risk Categories 1 through 7/8 (the last two risk categories combined) for three aircraft collateral types (above average, average, below average). The **Loan Term Sheet** paralleled ASU 2011 terms.
- Bid due date was 23 September 2019 for 1 December 2019 closing.
- **Ten (10) major global financial institutions active in aircraft finance submitted in confidence their Bid Charts to Prof. Linetsky (10 Exercise Bidders).**
- **To facilitate consistency and over time comparison the exercise methodology remained the same as in the previous four exercises.**
- Limitations:
  - 1) Bids are hypothetical, not actual market transactions. On one hand, a bid that is too low might not be approvable by the bank's credit committee. On the other hand, a bid that is too high would not be accepted by the customer. Nevertheless, since commercial bank loans are private transactions with confidential terms, this is the closest we can get to observing the bank loan market at a given point in time.
  - 2) The exercise considers only bank loans and does not consider alternative forms of financing, such as operating leases.
- Nevertheless, while the bids are not real transactions, the exercise bidders in many cases used their actual internal systems to generate their bids. The process has approximated the actual bidding on real transactions, in as much as a simulated exercise could.

## EXERCISE BID CHART / TERM SHEET

Loan Terms				All-in Margin, bps per annum		
				Aircraft Collateral Profile		
ASU Risk Cat	Credit Rating	Maturity	LTV	Above Average	Average	Below Average
1	BBB-	12	80			
2	BB+ / BB	12	85			
3	BB-	10	85			
4	B+	10	82.5			
5	B	10	82.5			
6	B-	10	77.5			
7 & 8	CCC / CC / C	10	72.5			

- Mortgage-style amortization (fully amortized / no balloon). Quarterly payments.
- **Asset-backed:** 1) a first-priority security interest in a new aircraft; 2) in the case of a lease structure, assignment and/or a first-priority security interest in the lease payments; 3) cross-default and cross-collateralization. For purpose of 3), assume two additional aircraft of the same type will be financed by your institution over the next year.
- The LTV will be the percentage of **certified net purchase price**. The “net purchase price”, as defined in the ASU, is the price invoiced by the manufacturer or supplier, after accounting for all price discounts and other cash credits, less all other credits or concessions of any kind related or fairly attributable to the aircraft. This is in **contrast to the appraised value**.
- An “**average enforcement jurisdiction**” falls in the middle of those jurisdictions in which your institution would enter into aircraft-backed loan transactions.
- Explanation of **aircraft collateral**: several specific aircraft models were included in each of three collateral categories (above average, average, below average). Aircraft models and their placement in these categories were suggested by financial institutions participating in the bid exercise (the actual aircraft models are not disclosed in this document due to confidentiality).

## EXERCISE BID CHART / TERM SHEET

- Assume that your institution agrees that the designated credit rating accurately reflects the risk of default in the subject transaction, and that no other factors are relevant to that risk. Within a given credit rating bucket, assume a midpoint according to your institution's internal metrics. Assume as follows: for Risk Category 1, a BBB- rating; for Risk Category 2, an average between BB+ and BB; for Risk Category 7/8, an average between CCC and C.
- Your bid is for an all-in margin in basis points per annum over ULIBOR for a floating rate loan. For example, a bid of 250 bps means that your institution would be willing to make a floating rate loan at LIBOR + 250 bps per annum to an airline in the subject risk category. This bid should as objectively as possible represent the lowest margin your institution (i) will accept for this hypothetical loan (meaning that your institution would not do this transaction for a lower margin), and (ii) believes has a realistic chance of being accepted by the airline customer.
- Neutralization of Other factors. All other factors relating to pricing should be neutralized. For example, assume average (i) ancillary fees (such as commitment fees), (ii) relationship enhancements and gains in market share or expertise, and, thus, resulting prospects for future business, and (iii) competition from other banks seeking to secure the transactions.
- Explanation of LTVs. LTV assumptions about risk mitigants ("RM") are as follows. The first A-type RM is assumed to be maturity reduction from 12 to 10 years. This reduces maturities for Risk Categories 3 to 8 from 12 to 10 years. Second and third A-type RMs are assumed to be 5% reductions in advance rate / LTV. Each B-type RM is assumed to be equivalent to a 2.5% reduction in advance rate (this is a reasonable assumption since a security deposit equal to one quarterly interest and principal payment is acceptable as the B-type RM under the ASU). The LTVs for Risk Categories 3 to 7/8 reflect the application of the ASU required number of A and B RMs. See ASU Appendix II, Table 1 (Risk Mitigants).
- **If your financial institution would not offer a loan to a particular credit rating with particular collateral type on the terms and conditions stated herein, leave that entry blank.**

# Results of 5<sup>th</sup> Bank Bid Exercise and Comparison with 2011 ASU

- Summary table provides median bids and averages of the two lowest bids in each credit rating / collateral type.
- Median: half of the distribution is above, half is below. For a sample with an odd number of data points, median is equal to the middle value (e.g. for 7 bids, the median bid is the 4<sup>th</sup> highest bid). For an even number of data points, it is equal to the average of the two middle values (e.g. for 6 bids, the median is the average of the 3<sup>rd</sup> and 4<sup>th</sup> highest bids). Median bid represents a median bidder in the bid exercise, with half of the bidders bidding below and half bidding above.
- While the median bid best represents a typical bid made by financial institutions in our bid exercise, the average of the two lowest bids better represents a bid that an airline customer would accept, assuming the pricing were the main determinant of the airline's decision and neutralizing other factors that may be relevant. (Actual bids are not shown due to confidentiality.)
- **ECA spreads are given for comparison and are equal to Q3 2019 MPR plus Margin Benchmark of 45 bps.**
- **Current ASU pricing (MPR + MB) is materially more expensive than commercial bank loan pricing for risk categories 1-6 (by 74 bps per annum on average across risk categories 1-6 and average collateral vs. 53 bps in BBE 4). For risk categories 7-8 the ASU pricing is 33 bps higher on average relative to the bids for these categories with average collateral. However, bank financing availability remains limited in this segment of the market, as evidenced by only 3 bidders in BBE 5 making bids for loans with average collateral to airlines in risk categories 7-8.**

Risk Category	ECA MPR+Marg.	Number of Bids	Median Bid	Median vs ECA % Difference	Average of 2 lowest bids	2 lowest vs. ECA % Difference
Above Average Collateral						
1	147	9	100	-32%	83	-44%
2	177	8	123	-31%	98	-45%
3	200	9	145	-28%	115	-43%
4	230	8	163	-29%	140	-39%
5	268	8	175	-35%	170	-37%
6	273	5	225	-18%	195	-29%
7 & 8	305	4	278	-9%	263	-14%
Average Collateral						
1	147	9	105	-29%	90	-39%
2	177	9	135	-24%	105	-41%
3	200	9	150	-25%	120	-40%
4	230	8	170	-26%	148	-36%
5	268	9	192.5	-28%	173	-36%
6	273	5	240	-12%	218	-20%
7 & 8	305	4	293.75	-4%	272	-11%
Below Average Collateral						
1	147	9	115	-22%	97	-34%
2	177	9	143	-19%	115	-35%
3	200	9	165	-18%	135	-33%
4	230	8	185	-20%	155	-33%
5	268	6	220	-18%	203	-24%
6	273	4	263	-4%	255	-7%
7 & 8	305	3	325	7%	319	5%

## II. ASU / Commercial Markets Comparison Exercise: EETC Issuance

- Dec 2017 - July 2019 Issues:
  - Air Canada 2017-1
  - Air Canada 2018-1
  - United Airlines 2018-1
  - British Airways 2018-1
  - United Airlines 2019-1
  - Delta Airlines 2019-1
- For each issue we compute composite (across all tranches with the same collateral) weighted average life (WAL), LTV and spread over interpolated mid-swaps matched to WAL (at issuance).
- LTVs in this document are based on **JP Morgan Master Model (JPM MM) Aircraft Current Market Value (CMV) Appraisals** (June 2019 Edition pages 39-45). JPM MM CMV methodology: JPM Aircraft CMV = average of Ascend and ASG CMV appraisals adjusted based on JPM Star Rating for the aircraft (5 stars: no haircut, 4 and 3 stars: 5% haircut, 2 stars: 10% haircut, 1 star: 15% haircut; aircraft collateral in 2015 EETC issues ranged from 3 to 5 stars).

# EETC / ASU Comparison Model

- Comparison with ASU 2011 ECA loans was made for each EETC issue. To maintain consistency the same comparison model was used as in 2012 - 2019 exercises with one exception. In the 2019 we used Margin Benchmark as published by the OECD in place of ECA bond spread benchmark in the previous exercises since there was no bond issuance by Ex-Im and European ECAs.
- **ASU Risk Category Assumptions:** since ASU Risk Category ratings are confidential and not known to us, we estimate category placement of airlines as follows. If Moody's and S&P agree on the rating, that rating is used. If Moody's and S&P disagree by one notch, we use the higher of the two ratings (this leads to a more conservative comparison). If Moody's and S&P disagree by two notches, we use the average of the two.
- All issuing airlines were in Cat 1 and 2 in this period, so no risk mitigants were applied.
- **Comparison Model (CM)** assumes that the airline borrows the LTV difference between EETC and ASU at the unsecured bond rate.
- **CM answers three questions:**
  - (1) Establish **advantage of one form of financing over the other** (EETC vs ASU loan) in basis points per annum.
  - (2) Determine **spread over swap** for the airline to achieve the same LTV for ECA financing with additional unsecured financing as achieved under the EETC financing, if EETC LTV is higher, or vice versa.
  - (3) Establish an **implied MPR** to achieve equivalency with the EETC financing (composite ECA with this MPR + unsecured financing spread = composite EETC spread over all tranches issued against the same collateral aircraft fleet).



# Caveats Regarding Our Comparison Model

## Inputs and Methodology

- **Purchase Prices:** ASU 2011 LTVs are based on certified net **purchase prices (PP)**, not 3<sup>rd</sup> party appraisals. Comparable LTVs cannot be computed for EETCs because of **unavailability of PP. In the absence of data on PP, precise quantitative comparison between the cost of EETC and ECA financing for airlines cannot be established.** In the absence of PP, comparisons of EETC vs. ECA financing, made by us or other 3<sup>rd</sup> parties, are *mere estimates*, and as such cannot be relied upon for making precise statements, such the computation of the *actual* advantage of one type of financing over the other.
- **LTVs:** This document presents a comparison based on JPM CMVs. Other aircraft appraisals may lead to different estimates. Our reasons for choosing JPM MM are: 1) public availability, 2) comprehensive nature, covering all outstanding EETC issues, 3) consistency across different EETC issues (the same approach is used for LTV analysis of all EETCs), 4) continued support and updates as new issues become available. Nevertheless, such appraisals have often been higher than net purchase prices of new aircraft and, as a result, our analysis is overly conservative.
- **Further simplifications:** we note that there are other differences in EETC and ECA structures beyond differences in LTV and WAL, including the presence of liquidity facility in EETC senior tranches, differences in the power of cross-collateralization and cross-default clauses based on the number of aircraft included in cross-collateral, etc. *To simplify our analysis these differences are not taken into account in our comparison model.*

# December 2017 – June 2019 EETC Issuance Summary

	Issue Date	Face	WAL	Coupon	Spread	BV LTV	CMV LTV
<b>Air Canada 17-1: 9 x B737 MAX 8, 4 x B787-9 / AC Moody's CFR Ba3 S&amp;P BB+ / ASU Cat 2</b>							
2017-1AA	7-Dec-17	\$400,108,000	8.8	3.00%	0.69%	40.0%	40.3%
2017-1A	7-Dec-17	\$172,198,000	8.8	3.55%	1.24%	57.2%	57.7%
2017-1B	7-Dec-17	\$146,875,000	5.5	3.70%	1.50%	71.9%	72.5%
2018-1AA-B		\$719,181,000	8.1	3.27%	0.98%	71.9%	72.5%
<b>Air Canada 18-1: 4 x B737 MAX 8, 1 x B787-9 / AC Moody's CFR Ba3 S&amp;P BB+ / ASU Cat 2</b>							
2018-1A	22-Feb-18	\$237,740,000	7.7	3.67%	0.80%	70%	71.1%
2018-1B	22-Feb-18	\$63,679,000	6.2	4.19%	1.37%	89%	90.1%
2018-1AB		\$301,419,000	7.4	3.78%	0.89%	89%	90.1%
<b>United 18-1: 6 x B737 MAX 9, 5 x B787-9, 3 x B777-300ER, 2 x B737-800 / UAL Moody's CFR Ba3, S&amp;P BB / ASU Cat 2</b>							
2018-1AA	31-Jan-18	\$677,175,000	8.9	3.50%	0.77%	42.6%	45.1%
2018-1A	31-Jan-18	\$257,965,000	8.9	3.70%	0.97%	58.9%	62.3%
2018-1AA-A		\$935,140,000	8.9	3.56%	0.83%	58.9%	62.3%
<b>British Airways 18-1: 7 x A320neo, 2 x B787-8, 2 x B787-9 / IALGN Moody's CFR Baa3, S&amp;P BBB- / ASU Cat 1</b>							
2018-1AA	14-Mar-18	\$409,783,000	7.4	3.80%	0.97%	48.6%	48.7%
2018-1A	14-Mar-18	\$198,768,000	7.4	4.15%	1.32%	72.2%	72.4%
2018-1AA-A		\$608,551,000	7.4	3.91%	1.08%	72.2%	72.4%
<b>United 19-1: 9 x B737 MAX 9, 6 x B787-10, 10 x Embraer 175 / United Moody's CRF Ba3, S&amp;P BB / ASU Cat 2</b>							
2019-1AA	28-Jan-19	\$716,625,000	9.1	4.15%	1.40%	42.4%	45.0%
2019-1A	28-Jan-19	\$296,445,000	9.1	4.55%	1.80%	59.9%	64.0%
2019-1AA-A		\$1,013,070,000	9.1	4.27%	1.52%	59.9%	64.0%
<b>Delta 19-1: 2x A220-100, 6 x A321-200, 4 x B737-900ER, 2 x A350-900 / Delta Moody's CRF Baa3, S&amp;P BBB- / ASU Cat 1</b>							
2019-1AA	6-Mar-19	\$425,000,000	5.1	3.20%	0.71%	49.0%	54.9%
2019-1A	6-Mar-19	\$75,000,000	5.1	3.40%	0.91%	56.8%	64.6%
2019-1AA-A		\$500,000,000	5.1	3.23%	0.74%	56.8%	64.6%

- CMV LTV: based on JPM Current Market Value of collateral aircraft (from JPM EETC Universe Master Model June 2019 Edition pages 55-61).
- BV LTV: prospectus base value LTV.
- CMV LTV for AC 18-1 is higher than ASU, for all others lower than ASU. Average CMV LTV is 71% across all issues.
- WAL: weighted average life. For DAL 19-1 WAL is shorter than ASU, for all others longer than ASU. Average WAL is 7.67 years across all issues.
- Coupon: prospectus coupon. For multiple tranches blended coupon is calculated across all tranches.
- Spread: over interpolated mid swap rates matched to WAL on the issue date.
- Ratings: when S&P and Moody's disagree by two notches (AC), we assign ASU Risk Category based on the average rating. When the ratings disagree by one notch (UAL), we assign the higher rating for a more conservative comparison with the ASU.

## Comparison Model Results (JPM CMV Appraisal Based)

	EETC	AC 17-1 AA-B	AC 18-1 A-B	UAL 18-1 AA-A	BA 18-1 AA-A	UAL 19-1 AA-A	DAL 19-1 AA-A	
	CFR Moodys/SP/ASU	Ba3/BB+/Cat 2	Ba3/BB+/Cat 2	Ba3/BB/Cat 2	Baa3/BBB-/Cat 1	Ba3/BB+/Cat 2	Baa3/BBB-/Cat 1	Average
EETC	Issue Date	7-Dec-17	22-Feb-18	31-Jan-18	14-Mar-18	28-Jan-19	6-Mar-19	
	WAL	8.1	7.4	8.9	7.4	9.1	5.1	7.67
	JPM CMV LTV	72.5%	90.1%	62.3%	72.4%	64.0%	64.6%	71.0%
	Spread over Swap	0.98%	0.89%	0.83%	1.08%	1.52%	0.74%	1.01%
ASU 2011 ECA	WAL	6.7	6.7	6.7	6.7	6.7	6.7	6.7
	ASU LTV w/ RM	85.0%	85.0%	85.0%	80.0%	85.0%	80.0%	83.3%
	CTC Discount	YES	YES	YES	YES	YES	YES	
	MPR	1.07%	0.99%	0.99%	0.80%	1.13%	0.88%	0.98%
	MB	0.59%	0.53%	0.53%	0.53%	0.48%	0.48%	0.52%
	All-in Spread	1.66%	1.52%	1.52%	1.33%	1.61%	1.36%	1.50%
EETC vs ASU 2011 ECA Analysis	EETC LTV - ASU LTV	-12.5%	5.1%	-22.7%	-7.6%	-21.0%	-15.4%	-12.4%
		EETC + Unsec	ECA + Unsec	EETC + Unsec	EETC + Unsec	EETC + Unsec	EETC + Unsec	
	Composite Spread	1.23%	1.60%	1.16%	1.16%	1.74%	1.01%	
	(ASU - Market) Spread	0.43%	0.71%	0.36%	0.17%	-0.13%	0.35%	0.32%
	Equivalent MPR	0.64%	0.36%	0.63%	0.63%	1.26%	0.53%	

- MPR (at time of EETC issue) for comparison with US EETC include 10% CTC discount (CTC comparable to Section 1110).
- ASU All-in Spread = MPR + Margin Benchmark.
- For AC 18-1 the EETC LTV is greater than the ASU. In this case ECA + Unsecured assumes the airline finances the difference between the higher EETC LTV and lower ASU LTV at the unsecured bond rate. Composite Spread is calculated based on the composite ASU ECA-supported + unsecured bond financing. For all others EETC LTVs are lower than ASU and EETC + Unsecured assumes the airline finances the difference in ASU LTV and EETC LTVs at the unsecured rate. Composite Spread is calculated on the composite EETC + unsecured bond financing. We use secondary market bond spreads over interpolated mid swaps on EETC issue dates.
- (ASU – Market) Spread: net advantage of one form of financing over the other in bps per annum taking into account the LTV adjustment. **Average advantage of EETC financing over ASU is 32 bps p.a. across six issues.**
- Equivalent MPR (with CTC discount) is such MPR that equalizes cost of ECA financing and EETC financing.

# Unsecured Airline Bond Issuance

Airline Group	Ratings (M/S)	Issue Month	Currency	Amount (mm)	Term (y)	Coupon	Spread to Mid Swaps (bps)
GOL	B2 / B	Dec-17	USD	650	8.1	7.000%	497
Korean Air Lines	NR / NR	Mar-18	USD	300	3.0	5.875%	334
Emirates	NR / NR	Mar-18	USD	600	10.0	4.500%	174
Delta Air Lines	Baa3 / BB+	Apr-18	USD	600	3.0	3.400%	65
Delta Air Lines	Baa3 / BB+	Apr-18	USD	500	5.0	3.800%	102
Delta Air Lines	Baa3 / BB+	Apr-18	USD	500	10.0	4.375%	152
Latam Airlines	NR / B+	Feb-19	USD	800	7.1	7.000%	446
Aegean Airlines	NR / NR	Mar-19	EUR	200	7.0	3.600%	340
United Airlines	Ba3 / BB	May-19	USD	350	5.7	4.875%	268
American Airlines	B1 / BB-	May-19	USD	750	3.1	5.000%	281
easyJet	Baa1 / BBB+	Jun-19	EUR	500	6.0	0.875%	118
TAP	NR / NR	Jun-19	EUR	200	4.0	4.375%	473
IAG	Baa3 / BBB	Jul-19	EUR	500	8.0	1.500%	165
IAG	Baa3 / BBB	Jul-19	EUR	500	4.0	0.500%	95
Lufthansa	Baa3 / BBB	Sep-19	EUR	500	5.0	0.250%	85

- Includes USD and EUR issues with term between 3 and 10 years
- Amounts in millions of issue currency
- Spread over relevant currency's interpolated mid-swaps on the issue date
- Ratings are unsecured issue ratings as of the issue date
- Source: Bloomberg