



AWG Submission to the OECD

Comparing the 2011 Aircraft Sector Understanding and Current Market Pricing

as assessed by AWG's independent technical expert in 2014

The Aviation Working Group (**AWG**) participated in the stakeholders' consultation held on 20 November 2014 at the OECD (the **OECD-organized consultations**). A primary purpose of the OECD-organized consultation was to update the 2013 assessments of the relationship between the Aircraft Sector Understanding of 2011 and current commercial and capital markets, given the objective of ensuring a proper relationship between them.

To facilitate that assessment, AWG submitted materials to the OECD, and, through it, to the governments participating in the Aircraft Sector Understanding of 2011. These materials included a study prepared by AWG's independent technical expert, Professor Vadim Linetsky, Ph.D. of Northwestern University.

AWG attaches this study hereto for general information. As AWG submitted these materials to the OECD on a confidential basis, by posting them on the AWG website, AWG waives that confidentiality. That waiver applies only to the materials attached hereto.

This action is based on a resolution of AWG agreed at its general meeting in London on 23 October 2014, and is taken following consultations with the OECD and Professor Linetsky.

Assessment of ASU 2011 vs. Commercial Markets Pricing in 2014*

**Vadim Linetsky, Ph.D.
Professor, Northwestern University
Independent Technical Advisor, AWG**

**Discussion Document
for the OECD ASU Consultations with Stakeholders
20 November 2014, Paris**

***Disclaimer:** Any opinions, findings, conclusions or recommendations expressed in this material are those of the author, Prof. Linetsky, expressed in his private individual capacity, do not necessarily reflect the views of the AWG or its individual members, Northwestern University, or any other 3rd parties, and are based on work and analysis completed to date and subject to change as additional data become available. No warranty or liability of any kind is assumed.

Executive Summary

I. Comparison of ASU 2011 and Commercial Markets: 2014 Point in Time Analysis

- ASU vs Bank loan market: according to our 3rd Bank Bid Exercise (BBE 3), current ASU pricing is materially more expensive (by 46 bps per annum or approximately 22% of MPR) than the current commercial bank loan pricing for Risk Categories 1-6 on average, while less expensive (by approximately 28 bps or 10% of MPR) than commercial bank loan pricing for Risk Categories 7-8. Commercial bank financing availability remains limited in this segment of the market, as evidenced by only 3 out of 10 bidders in our BBE 3 making bids for loans with average collateral to airlines in Cats 7-8.
- ASU vs Capital markets: US airlines' (AAL, UAL) EETCs have more favorable terms (WAL, LTV) and materially better pricing than current ASU. No EETC issuance by non-US airlines in 2014. Investment-grade airlines (FedEx, Lufthansa, Ryanair) issue unsecured bonds at materially lower spreads than the current ASU Category 1 secured pricing. WestJet unsecured bond spread approximately equal to ASU Cat 1 with CTC discount.

II. Comparison of ASU 2011 and Commercial Markets: Over Time Analysis

- ASU vs Bank loan market: According to BBE 1, in Jan 2013 ASU pricing was more advantageous for Cats 4-8 relative to commercial bank loans (more expensive for Cats 1-2 and on par for Cat 3). According to BBE 2, in Oct 2013 ASU pricing was largely on par with commercial bank loans for Cats 1-6. According to BBE 3, in Oct 2014 ASU pricing is materially more expensive relative to bank loans for Cats 1-6 due to slower ASU MPR and RBR downward adjustments in 2014 relative to faster downward adjustment in commercial pricing in the strong market (from 2013 to 2014 bank loan margins decreased by approximately 70 bps (29% of the margin) on average vs. 20 bps (12%) decrease in MPRs). ASU pricing continued to stay less expensive for Cats 7-8 throughout BBE 1 to 3.
- ASU vs Capital markets: From 2013 to 2014 US airline EETC spreads over swaps decreased by approximately 72 bps (35% of the spread) for A tranches and 126 bps (33% of the spread) for B tranches – a materially faster decline than the average 20 bps reduction in MPRs (12% of MPR) during this period.

Detailed Executive Summary: Q3 2014 Exercise Results

I. 3rd Bank Bid Exercise vs. ASU:

1. Average of two lowest bids for average aircraft collateral is 22% lower than ASU MPR + ECA Bank Funding Margin Benchmark for Cats 1-6 on average, and 10% higher for Cats 7 and 8. For above average collateral, average of two lowest bids is 24% lower than ASU for Cats 1-6 and 8% higher than ASU for Cats 7-8. For below average collateral, average of two lowest bids is 18% lower than ASU for Cat 1-6 and 13% higher for Cats 7-8.
2. MPRs for Cats 1-8 decreased by 12% on average. Average of two lowest bids in BBE 3 decreased by 29% on average across all risk categories and collateral types relative to BBE 2. ASU MPR adjustment mechanism has been slower to adjust as commercial markets strengthened in 2014.

II. EETC 2014 issuance vs. ASU:

1. 2014 EETC (AAL, UAL) spreads unadjusted for LTV and WAL differences are materially lower than the current ASU 2011 Pricing.
2. AAL and UAL EETCs have more favorable terms (longer WAL, higher LTV) than the ASU terms. Based on LTVs computed from J.P. Morgan Master Model current market value (CMV) aircraft appraisals on the EETC side and on the application of LTV-reducing risk mitigants on the ECA side, ECA financing under ASU 2011 is materially more expensive than EETC financing for US airlines in 2014. Our estimates of the overall EETC advantage over ECA financing under the ASU range from 64 to 114 bps per annum for US airlines (84 bps average advantage across 3 EETC issues in 2014). The precise numerical relationship between EETC vs. ECA financing is predicated on the choice of proxy for the aircraft net purchase price for LTV calculation.
3. Average spread across all A tranches issued by US airlines in 2014 decreased by 35% relative to 2013. Average spread across all B tranches decreased by 33%. This constitutes a materially larger decrease than the 12% decrease in MPRs.

III. 2014 Unsecured Bond Issuance vs. ASU:

1. FedEx, Lufthansa, Ryanair issued unsecured bonds at spreads materially lower than the cost of secured financing under ASU for Cat 1. WestJet issued unsecured at about the cost of Cat 1 with CTC. Air France-KLM issued unsecured at 100 bps above ASU Cat 2. American issued unsecured at 128 bps above Cat 4. Air Canada and Avianca issued unsecured at approximately 300 bps above Cats 4 and 6, respectively.
2. More data outside of North America and Europe are needed to make general inferences about non-US / Canada / European airline capital markets pricing (EETC and unsecured).

Point in Time Summary: ASU vs. Commercial Markets Q3 2014

➤ **ASU 2011 Loan:** ASU 2011 MPR (Q3 2014) plus ECA Bank Funding Margin Benchmark over LIBOR (BFMB) of 55 bps

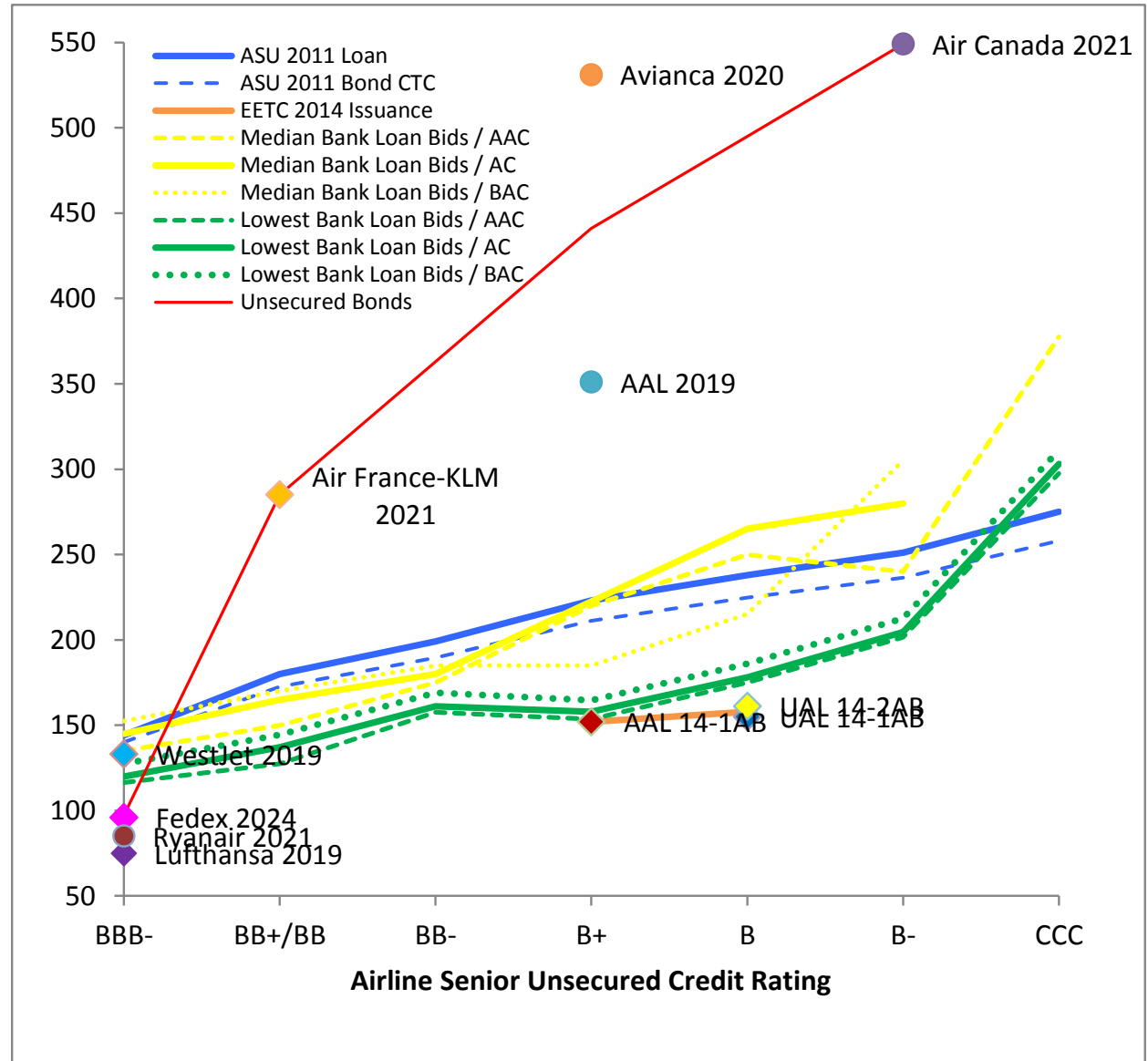
➤ **ASU 2011 Bond CTC:** ASU 2011 MPR with CTC discount (Q3 2014) plus ECA Bond Spread Benchmark over interpolated mid-swaps (BSB) of 60 bps

➤ **Unsecured bond spreads over interpolated mid-swaps:** Air Canada, Air France-KLM, American, Avianca, Fedex, Lufthansa, Ryanair, WestJet

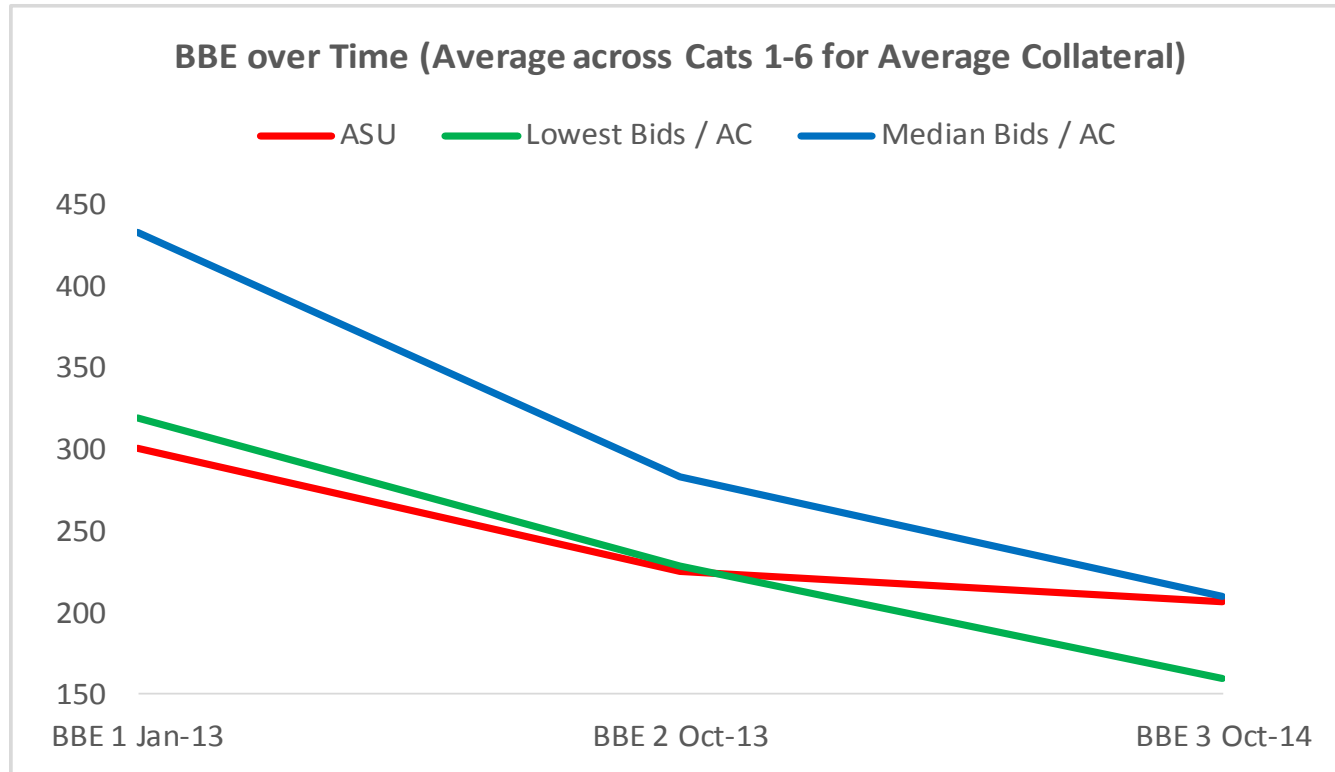
➤ **Median Bank Loan Bids / AAC, AC, BA:** Bank Bid Exercise Medians with Above Average Collateral (AAC), Average Collateral (AC), Below Average (BAC)

➤ **Lowest Bank Loans Bids / AAC, AC, BA:** Average of Two Lowest Bank Bids

➤ **EETC 2014 Issuance:** Composite spreads over interpolated mid-swaps matched to WAL for 2014 EETC issues calculated at issuance. Individual issues AAL 14-1, UAL 14-1,2 also shown

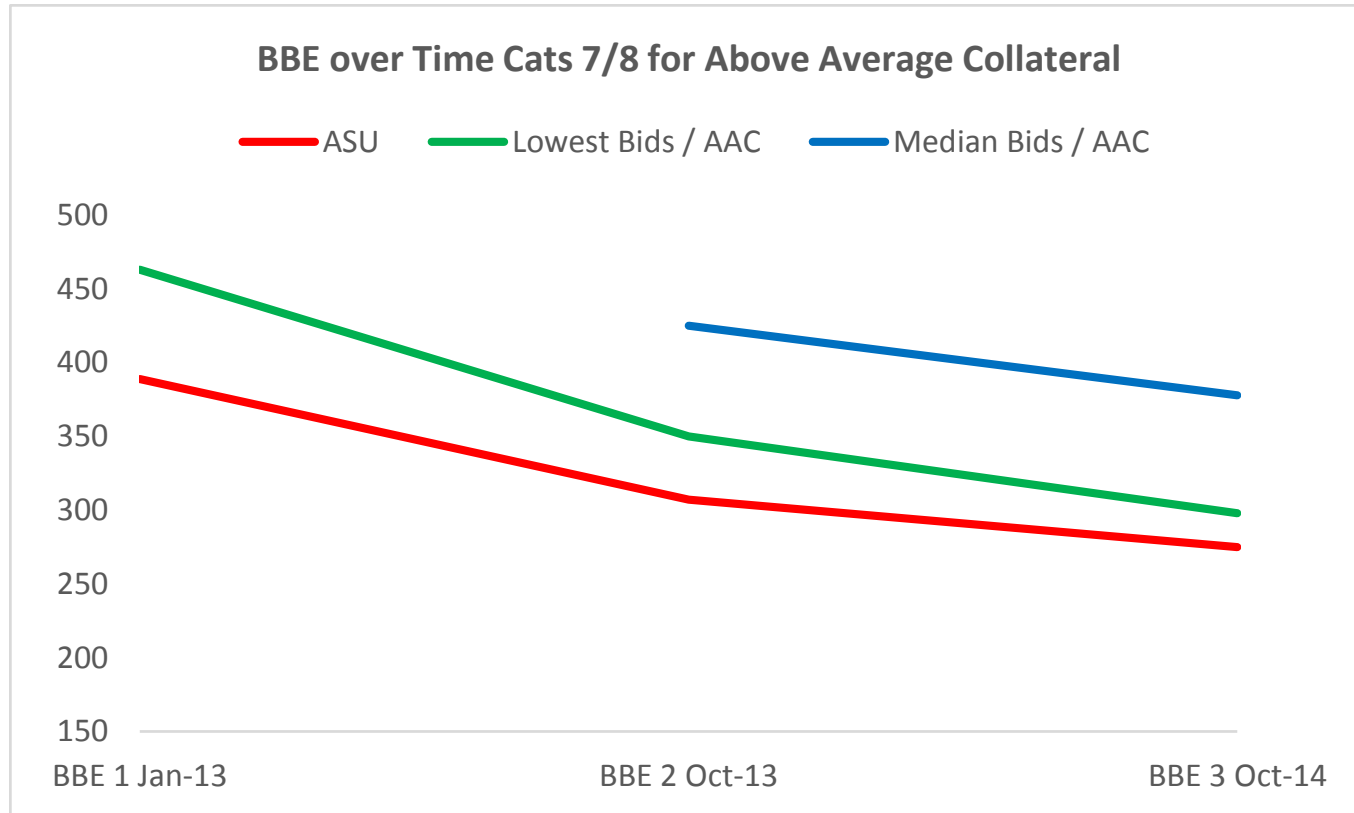


BBE vs ASU Over Time Comparison for Risk Categories 1-6



- BBE1: lowest bids slightly higher than ASU / median bids materially higher.
- BBE2: lowest bids essentially match ASU / median bids still materially higher.
- BBE 3: lowest bids materially lower than ASU / median bids essentially match ASU.
- **ASU adjustment mechanism is slow to track the banks in the strong market.**
- Risk Categories 1-6 included in this analysis (average across Cats 1-6; AC = average collateral).

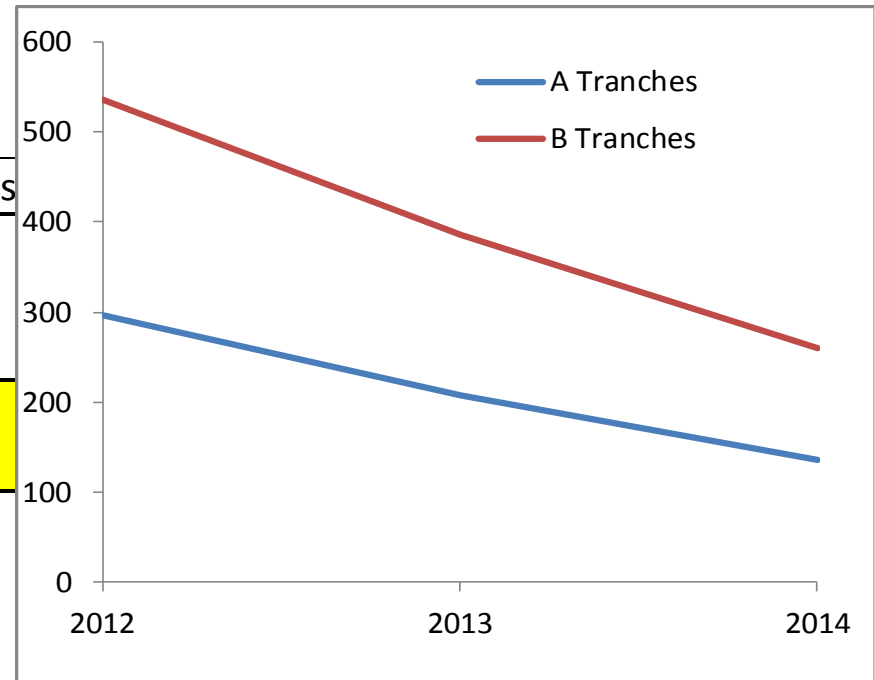
BBE vs ASU Over Time Comparison for Risk Categories 7-8



- We have limited bank pricing data for Cats 7-8 to make broad inferences for these risk categories. In BBE 3 only 3 out of 10 exercise bidders made bids for loans with average collateral to airlines in Risk Categories 7-8 (4 bids for loans with above average collateral). Commercial bank financing availability remains limited in this segment of the market.
- The limited data we have indicate that ASU pricing has remained lower in this segment than the bank market during 2012-2014.
- This chart plots the average of two lowest bids and the median bid for loans with above average collateral to Cats 7-8. We do not have sufficient data for average and below average collateral to construct a similar chart. For BBE 1 we report only the average of two lowest bids and do not report the median because we only had 2 bids for Cats 7-8 in BBE 1.

2012-2014 EETC Issuance by US Airlines

	A Tranches	B Tranches
2012	296	536
2013	207	385
2014	135	259
2013 to 2014 % Change	-35%	-33%
2012 to 2014 % Change	-54%	-52%



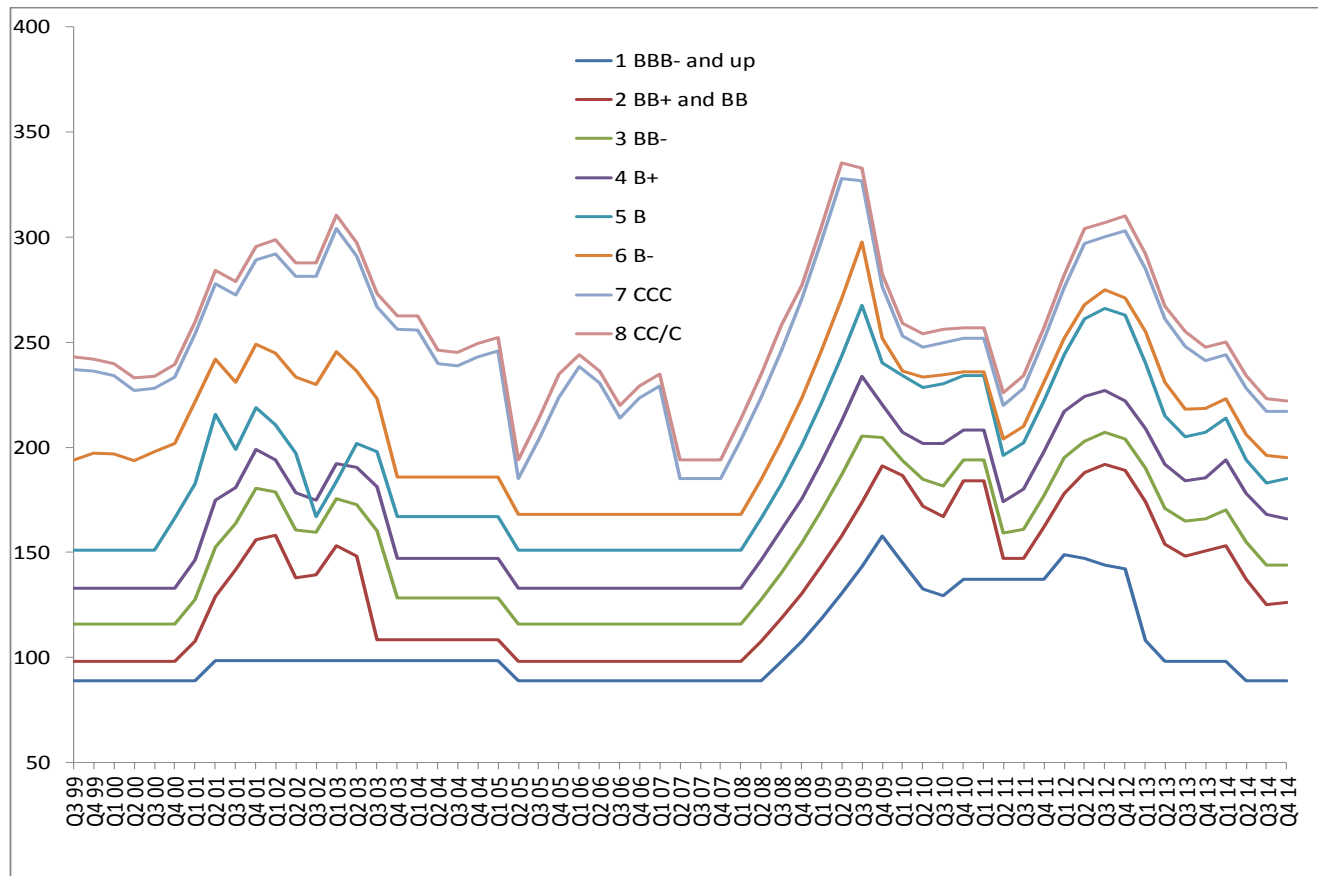
- Average spreads over interpolated swaps matched to WAL in basis points per annum across all A tranches and B tranches for EETC A and B tranches issued by US Airlines in 2012, 2013 and 2014 (non-US 2012 / 2013 issues are excluded from this analysis because of the absence of non-US issues in 2014).
- **Average spread over swaps across all A tranches decreased by 72 bps (35% of the spread) from 2013 to 2014. Average spread for B tranches decreased by 126 bps on average (33% of the spread).**

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- **I. Review of ASU 2011 Pricing: 2014 Update**
- **II. ASU 2011 vs. Commercial Markets Comparison: 3rd Bank Bid Exercise (BBE 3)**
- **III. ASU 2011 vs. Commercial Markets Comparison: 2014 EETC Issuance**
- **IV. Airline Unsecured Bond Issuance in 2014**

I. Review of ASU 2011 MPR Adjustments: 2014 Update

Historical MPR Simulation Q3 1999 through Q4 2010 and Actual MPR Adjustments Q1 2011 through Q4 2014



- Historical simulation of ASU 2011 MPRs from Q3 1999 to Q4 2010 conducted by Dr. Linetsky.
- Actual MPR adjustments from Q1 2011 to Q4 2014.
- **ASU 2011 is a dynamic pricing system indexed to the corporate bond market** through Market Reflective Surcharge (MRS). **Volatility over the full market cycle:** the range from low MPRs (in 2007) to high MPRs (financial crisis of 2008/9) has been approximately 70% to 80%.
- **In 2014 MPRs largely returned to their (simulated) pre-2008 levels.**

Q3 2014 vs. Q3 2013 MPR Comparison

	MPR		
Cat	Q3 2013	Q3 2014	% Change
1	98	89	-9%
2	148	125	-16%
3	165	144	-13%
4	184	168	-9%
5	205	183	-11%
6	218	196	-10%
7	248	217	-13%
8	255	223	-13%
Cat 1-8 Average:			-12%

- Minimum premium rates (MPRs) decreased by 20 bps on average (12% of MRP).
- Overall cost of financing under ASU (MPRs + margin) decreased by 9% on average.

Spreads on ECA Guaranteed Bonds and Loans

- To assess spreads on ECA guaranteed bonds and loans that contribute to the cost of financing with ECA support in addition to MPRs, in BBE 3 we follow the methodology established in BBE 2 with two separately constructed benchmarks for the purposes of comparison with BBE and EETC.
- **ECA Bond Spread Benchmark (BSB)**: in 2014 EETC comparison exercise we use the **average spread over interpolated mid-swaps matched to WAL across Ex-Im guaranteed bonds as the comparison benchmark for fixed-rate capital markets transactions**. No bonds issued by European ECAs in 2014, thus only Ex-Im bonds are used.
- To establish a benchmark for our Bank Bid Exercise, we conducted a separate **ECA Bank Bid Exercise**, requesting bids for margin over LIBOR on Ex-Im and EU ECA guaranteed ASU compliant loans from a panel of commercial banks active in funding ECA guaranteed loans. We received bids from four (4) banks. We use the **average of two lowest bank bids over LIBOR on both Ex-Im and European ECA guaranteed loans as the comparison benchmark for our BBE**. We call it **ECA Bank Funding Margin Benchmark (BFMB)**. This is an appropriate benchmark for comparing BBE with ECA bank loan financing, as it involves only bank loans.
- **Using these two separate benchmarks, we consistently compare bonds with bonds (EETC with ECA bonds) and commercial loans with commercial loans.**

II. ASU / Commercial Markets Comparison: 3rd ASU / Bank Bid Exercise

- In September Dr. Linetsky conducted a **3rd 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 29 September 2014.
- **Ten (10) major financial institutions active in aircraft finance submitted in confidence their Bid Charts to Prof. Linetsky (10 Exercise Bidders). Increase from 6 bidders in BBE 1 and 9 bidders in BBE 2.**
- **To facilitate comparison, exercise methodology remained exactly the same as in the previous 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 LIBOR 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.**

ECA Bank Funding Margin Benchmark = 55 bps

- Four (4) Exercise Bidders submitted bids for margin over LIBOR on Ex-Im and European ECA guaranteed bank loans.
- **Ex-Im** average bid: 56 bps. Average of two lowest bids: **50 bps.**
- **EU ECA** average bid: 65 bps. Average of two lowest bid: **60 bps.**
- Average margin over LIBOR across **Ex-Im and EU ECA bank loans**: 60 bps. Average of two lowest margins: **55 bps.**
- This is our **ECA Bank Funding Margin Benchmark** for comparison with BBE. (We take the average of two lowest bids in the BFMB for consistency with our approach to asset backed loans in BBE.)

Results of the Bank Bid Exercise and Comparison with 2011 ASU

- This 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 4th 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 3rd and 4th highest bids). Median bid represents a median bidder in the bid exercise, with half of the bidders bidding below and half bidding above.
- We require at least 4 bids for a credit rating / collateral type combination to compute the median. We require at least 3 bids to report the average of the two lowest bids.
- 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 2014 MPR plus ECA Bank Funding Margin Benchmark of 55 bps.**
- **The average of two lowest bids for average aircraft collateral is 22% lower than ASU MPR + ECA Bank Funding Margin Benchmark for Cats 1-6 on average, and 10% higher for Cats 7 and 8. For above average collateral, the average of two lowest bids is 24% lower than ASU for Cats 1-6 and 8% higher than ASU for Cats 7-8. For below average collateral, the average of two lowest bids is 18% lower than ASU for Cat 1-6 and 13% higher for Cats 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	144	10	135	-6%	117	-19%
2	180	9	150	-17%	128	-29%
3	199	9	175	-12%	158	-21%
4	223	8	220	-1%	154	-31%
5	238	7	250	5%	175	-26%
6	251	5	240	-4%	202	-20%
7 & 8	275	4	378	37%	298	8%
Average Collateral						
1	144	10	145	1%	120	-17%
2	180	9	165	-8%	137	-24%
3	199	9	180	-10%	161	-19%
4	223	8	223	0%	158	-29%
5	238	7	265	11%	178	-25%
6	251	5	280	12%	205	-19%
7 & 8	275	3			303	10%
Below Average Collateral						
1	144	8	153	6%	128	-11%
2	180	7	170	-6%	145	-20%
3	199	7	185	-7%	169	-15%
4	223	4	185	-17%	165	-26%
5	238	5	215	-10%	186	-22%
6	251	4	305	22%	213	-15%
7 & 8	275	3			311	13%

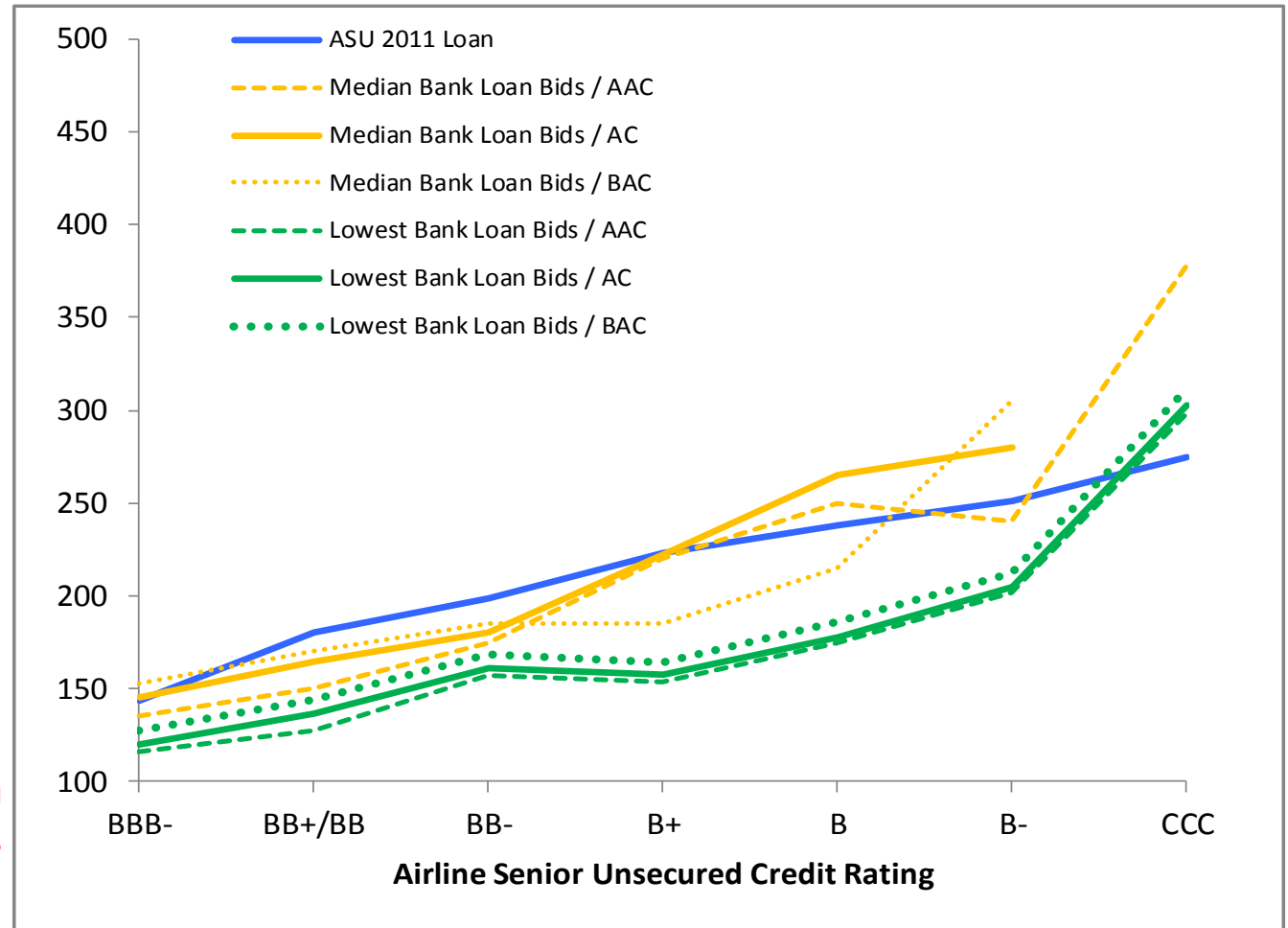
ASU 2011 Q3 2014 vs. Bank Loan Bid Exercise

➤ **ASU 2011 Loan:** ASU 2011 MPR (Q3 2014) plus ECA Bank Funding Margin Benchmark of 55 bps.

➤ **Median Bank Loan Bids / AAC, AC, BA:** Bank Loan Bid Exercise 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

➤ **Lowest Bank Loan Bids curves for all 3 collateral categories (green) are materially lower than the ASU curve (solid blue) for Risk Cats 1-6, and higher for Cats 7/8 (CCC).**



BBE 1-3 Comparison

	Average of 2 Lowest Bids					Median Bids				
Risk Cat	BBE 1 Jan-13	BBE 2 Oct-13	BBE 1 to 2 % Change	BBE 3 Oct-14	BBE 2 to 3 % Change	BBE 1 Jan-13	BBE 2 Oct-13	BBE 1 to 2 % Change	BBE 3 Oct-14	BBE 2 to 3 % Change
	Above Average Collateral					Above Average Collateral				
1	175	143	-19%	117	-18%	230	155	-33%	135	-13%
2	235	170	-28%	128	-25%	300	205	-32%	150	-27%
3	290	208	-28%	158	-24%	348	260	-25%	175	-33%
4	335	248	-26%	154	-38%	415	285	-31%	220	-23%
5	360	268	-26%	175	-35%	525	300	-43%	250	-17%
6	398	268	-33%	202	-25%	588	335	-43%	240	-28%
7 & 8	463	350	-24%	298	-15%	NA	425		378	-11%
	Average Collateral					Average Collateral				
1	195	155	-21%	120	-23%	230	175	-24%	145	-17%
2	243	195	-20%	137	-30%	325	220	-32%	165	-25%
3	298	223	-25%	161	-28%	365	255	-30%	180	-29%
4	360	255	-29%	158	-38%	440	318	-28%	223	-30%
5	380	270	-29%	178	-34%	575	335	-42%	265	-21%
6	438	270	-38%	205	-24%	663	395	-40%	280	-29%
7 & 8	NA	375		303	-19%	NA	455		NA	
	Below Average Collateral					Below Average Collateral				
1	225	165	-27%	128	-23%	260	200	-23%	153	-24%
2	268	205	-23%	145	-30%	375	250	-33%	170	-32%
3	333	260	-22%	169	-35%	413	303	-27%	185	-39%
4	423	283	-33%	165	-42%	513	310	-40%	185	-40%
5	NA	320		186	-42%	NA	348		215	-38%
6	NA	343		213	-38%	NA	425		305	-28%
7 & 8	NA	388		311	-20%	NA	NA		NA	

- **BBE 3 vs. BBE 2:** average of two lowest bids decreased by 70 bps (29% of margin) on average across all risk categories and collateral types.
- Materially greater reduction in spreads than the average 20 bps (9% reduction) in ASU financing cost (MPR + Bank Funding Margin Benchmark) from Q3 2013 to Q3 2014.
- **ASU financing cost reductions materially slower on the way down vs. the bank loan market during this period of strong commercial markets.**

III. ASU / Commercial Markets Comparison Exercise: 2014 EETC Issues

➤ US Issues:

- American 2014-1
- United 2014-1
- United 2014-2

- 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** (March 2014 Edition pages 43-49). JPM MM CMV methodology: JPM Aircraft CMV = average of Ascend and ASG CMV appraisals adjusted based on JPM Star Rating for the aircraft (5 star: no haircut, 4 and 3 stars: 5% haircut, 2 stars: 10% haircut, 1 star: 15% haircut; aircraft collateral in 2014 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 and 2013 exercises.** It was assumed that all A risk mitigants are 5% LTV reductions and B risk mitigants are security deposits approximately equivalent to 2.5% LTV reduction.
- **“Specific choice of RMs is an ECA decision.” Sources: Ex-Im Bank and European ECAs.** This comparison assumes the ECA chooses LTV reducing risk mitigants. This is a reasonable assumption in view of the fact that ASU 2011 gives ECAs the prerogative to request LTV-reducing risk mitigants. If an ECA chooses different risk mitigants in a *particular* transaction does not change the fact that it has the prerogative to insist on LTV reduction if this is what it deems appropriate. We also note that, according to our prior analysis of Loss-Given-Default and LTV profiles over the life of the ECA loan, the effects of the three A-type risk mitigants on reducing ECA’s risk, while not completely equivalent, are largely comparable.
- **ASU Risk Category Assumptions:** since ASU Risk Category ratings are confidential and not known to us, we estimated 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.
- **Comparison Model (CM)** assumes that the airline borrows the LTV difference at the unsecured rate (unsecured bullet financing). Maturity of the unsecured financing is chosen to make the composite debt structure (ECA + unsecured financing for LTV difference) match composite EETC WAL (across all tranches). The CM assumes that the ECA fixed rate loan rate is equal to 7-year swap rate + ECA Bond Spread Benchmark + ASU 2011 MPR (effective at the time of EETC issuance). ECA Bond Spreads were added to CDS to arrive at all-in unsecured financing spreads.
- **ECA Bond Spread Benchmark in CM:** as discussed on pages 9 through 11 of 2013 exercise, in place of the Margin Benchmark we use ECA Bond Spread Benchmark computed as the average spread over interpolated swaps matched to WAL for Ex-Im guaranteed bonds. When comparing specific EETC issues, Ex-Im bonds issued in the same month were used. No European ECA bond issues in 2014.
- **CM answers three questions:**
 - (1) Determine **spread over swap** for the airline to achieve the same LTV and WAL for ECA financing with additional unsecured financing as achieved under the EETC financing.
 - (2) Establish **advantage of one form of financing over the other** (EETC over ASU loan or ASU loan over EETC) in basis points per annum.
 - (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 3rd 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 3rd 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.
- **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.*
- **Unsecured financing assumption and lower rated airlines:** Our comparison model assumes that the LTV difference is financed at the unsecured rate. This assumes availability of unsecured financing. In practice lower rated airlines may experience difficulties accessing such unsecured financing. This may make ECA financing under ASU 2011 unobtainable for airlines in lower risk categories due to their inability to raise down payments required to meet risk mitigants. We currently do not have the data to test this proposition.

ECA Bond Spread Benchmark

- We examined ECA guaranteed bonds issued in 2014:
 - **Ex-Im:** 26 issues (11 airlines). Average spread over interpolated mid-swaps matched to WAL was **60 bps**. (Corresponding to the average LIBOR-equivalent spread of 33 bps.)
 - No ECGD and Coface guaranteed issues in 2014 (as of Sept 2014).
 - Due to the lack of bond issuance by European ECAs, we took Ex-Im spread of 60 bps as our ECA Bond Spread Benchmark in this exercise. This benchmark is likely biased low due to the lack of issuance by European ECAs in 2014 (in 2013 ECGD issued 6 bonds at an average spread of 38 bps over Ex-Im, Coface issued 3 bonds at an average spread of 59 bps over Ex-Im).

- **Technical note: difference between spreads over interpolated mid-swaps matched to WAL and LIBOR-equivalent spreads**

Spreads over interpolated mid-swaps matched to WAL on a fixed-rate instrument are computed by approximating the repayment profile with a WAL-matched bullet and swapping it at the interpolated WAL-matched mid-swap rate. For a 12 year ECA bond, a more precise analysis requires swapping fixed interest on each of the 48 principal payments in the 12 year mortgage-style principal amortizing profile into LIBOR. The difference between the spread obtained via this precise calculation and the WAL-matched approximation depends on the shape of the swap curve (in particular, the difference between the front end of the curve with tenors shorter than WAL and the long end of the curve with tenors longer than WAL). In 2014 it was in the 20 to 30 bps range for Ex-Im bonds. In our EETC / ASU comparison exercise we consistently used spreads over interpolated mid-swaps matched to WAL for *both* ECA-guaranteed bonds and EETCs, using the same metrics on both legs (ECA bond and EETC).

2014 US Airlines EETC Summary

	Issue Date	Face	WAL	Coupon	Spread	BV LTV	CMV LTV
UAL 14-1: 13 B737-924ER, 2 B787-8, 1 B787-9, 9 ERJ 175LR (New) / UAL Moody's CFR B2, S&P B / ASU Cat 5							
2014-1A	24-Mar-14	\$736,647,000	8.8	4.00%	1.33%	55.1%	61.5%
2014-1B	24-Mar-14	\$212,812,000	5.9	4.75%	2.62%	71.0%	79.2%
2014-1AB		\$949,459,000	8.2	4.13%	1.55%	71.0%	79.2%
UAL 14-2: 11 B737-924ER, 4 B787-9, 12 ERJ 175LR (New) / UAL Moody's CFR B2, S&P B / ASU Cat 5							
2014-2A	28-Jul-14	\$823,071,000	8.8	3.75%	1.38%	55.1%	60.9%
2014-2B	28-Jul-14	\$238,418,000	5.9	4.625%	2.66%	71.0%	78.5%
2014-2AB		\$1,061,489,000	8.2	3.91%	1.61%	71.0%	78.5%
AAL 14-1: 5 B777-323ER, 5 A319-112, 7 A321-231 (2012-2014) / AAL Moody's CFR B1, S&P B / ASU Cat 4							
2014-2A	2-Sep-14	\$741,460,000	8.4	3.70%	1.34%	54.2%	62.8%
2014-2B	2-Sep-14	\$215,424,000	5.4	4.375%	2.49%	69.7%	81.0%
2014-2AB		\$956,884,000	7.8	3.81%	1.52%	69.7%	81.0%

- CMV LTV: based on JPM Current Market Value appraisal of collateral aircraft (from JP Morgan Master Model March 2014 Edition pages 43-49). For all 2014 US airline EETC issues in 2014 CMV LTVs are higher than ASU LTVs (with risk mitigants).
- BV LTV: prospectus base value (BV) LTV.
- WAL: weighted average life. For all 2014 US airline EETC issues, WAL is longer than ASU WAL.
- Coupon: prospectus coupon. For multiple tranches blended coupon calculated as the IRR of the financing including all tranches.
- Spread: over the interpolated swap rate matched to WAL on the issue date.
- When S&P and Moody's ratings disagree (AAL), we assign ASU Risk Category based on higher rating for a more conservative comparison with the ASU.

2014 Comparison Model Results (JPM CMV Appraisal Based)

	EETC	AAL 14-1AB	UAL 14-1AB	UAL 14-2AB
	CFR Moodys/SP/ASU	B1/B/Cat 4	B2/B/Cat 5	B2/B/Cat 5
EETC	Issue Date	2-Sep-14	24-Mar-14	28-Jul-14
	WAL	7.8	8.2	8.2
	JPM CMV LTV	81.0%	79.2%	78.5%
	Spread over Swap	1.53%	1.55%	1.61%
ASU 2011 ECA	WAL	6.7	6.7	6.7
	ASU LTV w/ RM	77.5%	77.5%	77.5%
	CTC Discount	YES	YES	YES
	MPR	1.51%	1.93%	1.65%
	ECA BSB	0.50%	0.65%	0.53%
	All-in Spread	2.01%	2.58%	2.18%
EETC vs ASU 2011 ECA Analysis	EETC LTV - ASU LTV	3.50%	1.70%	1.00%
		ECA + Unsec	ECA + Unsec	ECA + Unsec
	Composite Spread	2.17%	2.69%	2.25%
	EETC vs ASU Advant.	0.64%	1.14%	0.64%
	Equivalent MPR	0.79%	0.72%	0.99%

- MPR for comparison with US EETCs are with 10% CTC discount (CTC comparable to Section 1110).
- ASU LTV is with risk mitigants.
- ASU All-in Spread = MPR + ECA BSB (for more accurate comparison in this table we use spread over swaps on Ex-Im bonds issued closest to the date of the EETC issue).
- ECA + Unsecured: assumes the airline finances the difference in LTVs under EETC and ASU ECA-supported loan at the unsecured rate with unsecured financing with maturity such that WAL of the composite financing (ECA + unsecured) is equal to the EETC WAL. Composite Spread is calculated on the composite ASU ECA-supported + unsecured financing.
- EETC vs. ASU Advantage: Composite Spread (ECA supported loan + Unsecured) minus EETC spread.
- Equivalent MPR (with 10% CTC discount) is such MPR (with 10% CTC discount) that makes the Composite Spread for ECA-supported + unsecured financing equal to the EETC spread.

EETC / ASU Comparison Analysis

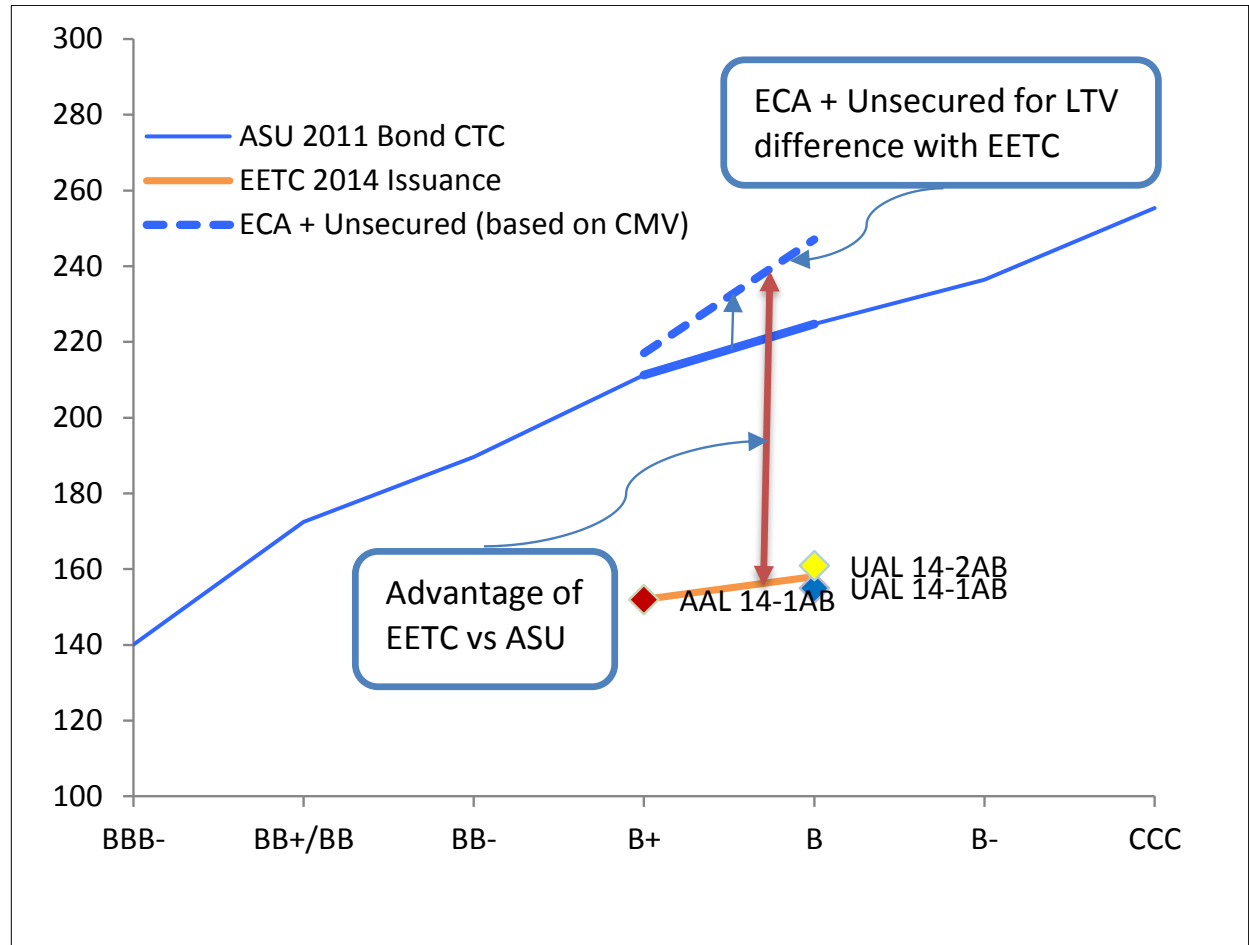
- Light EETC issuance in 2014, in part due to strong bank debt and leasing markets and favorable bond market conditions that allowed a number of airlines to issue unsecured bonds.
- 2014 EETC US airline spreads over mid-swaps unadjusted for the differences in LTV and WAL are materially lower (by 70 bps on average) than the current ASU 2011 pricing.
- All 2014 EETCs have more favorable terms (longer WAL, higher LTV) than the ASU 2011 terms. According to our Comparison Model based on LTVs computed from J.P. Morgan Master Model current market value aircraft appraisals on the EETC side and the application of LTV-reducing risk mitigants on the ECA side, ECA financing under ASU 2011 is materially more expensive than EETC financing by US airlines in 2014. Our estimates of overall EETC advantage over ECA financing under the ASU range from 64 to 114 bps per annum (81 bps on average) for US airlines *based on JPM aircraft CMV appraisals*. The precise numerical relationship between EETC vs. ECA financing is predicated on the proxy used for the aircraft net purchase price used for the LTV calculation. Different aircraft appraisals will lead to different LTVs and different numerical comparison conclusions.
- No EETC issues by non-US airlines in 2014. Further analysis will be conducted as new issues come to market.

ASU 2011 Q3 2014 vs. EETC Issuance in 2014

➤ **ASU 2011 Bond CTC:** ASU 2011 MPR with CTC discount (Q3 2014) plus ECA Bond Spread Benchmark (BSB) of 60 bps.

➤ **EETC 2014 Issuance:** Composite spreads over swap rates (matched to WAL) for 2014 EETC issues calculated at issuance. Average for B includes UAL 2014-1 and UAL 2-14-2. Individual EETC issues also shown.

➤ **ECA + Unsecured (based on CMV):** Composite spread for ECA guaranteed loan at ASU 2011 MPR + BSB plus unsecured financing for the excess EETC LTV over and above ASU LTV with risk mitigants (based on JP Morgan Master Model (March 2014) current market value (CMV) appraisals).

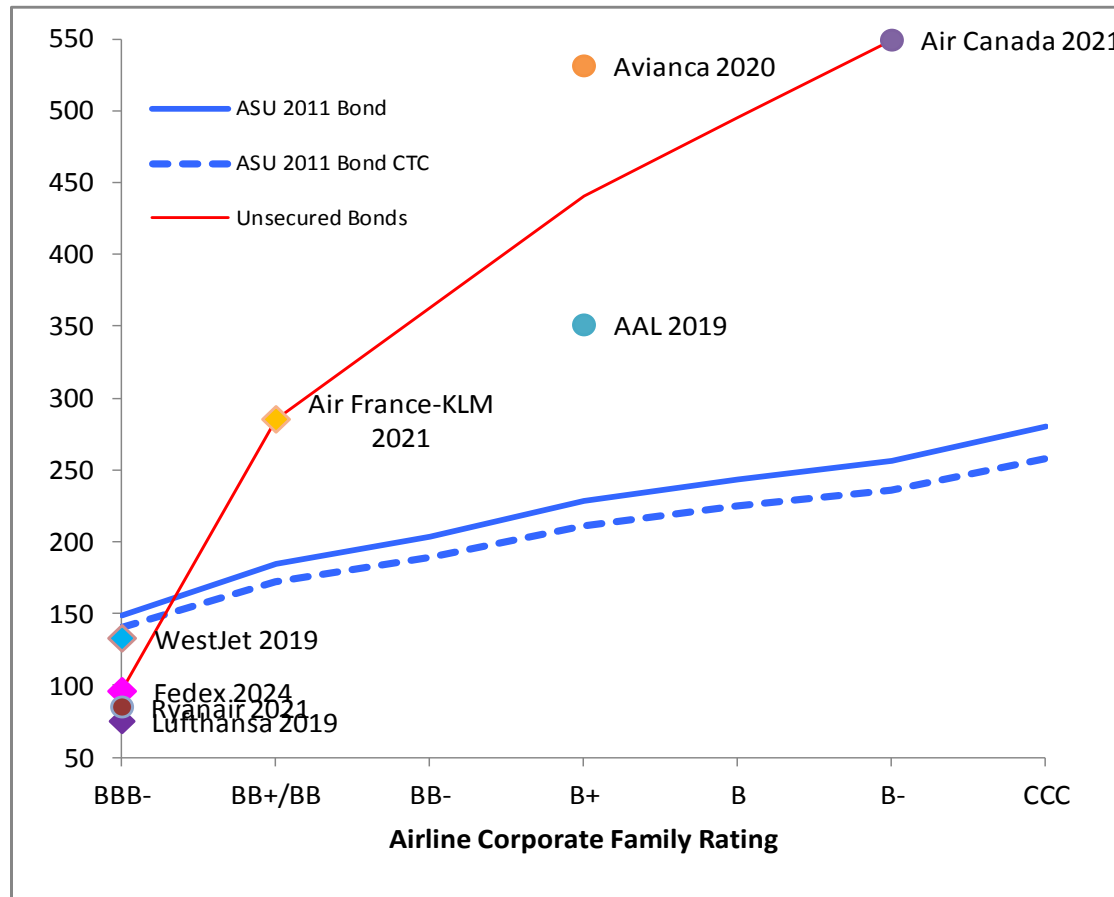


IV. Unsecured Bond Issuance in 2014

Airline	Moody's / S&P	Month	Amount	Term, Years	Coupon	Spread
FedEx	Baa1 / BBB	Jan-14	USD 750	10 year	4.000%	MS + 96
Avianca	NR / B+	Apr-14	USD 250	6 year	7.440%	MS + 531
Air Canada	B3 / B	Apr-14	USD 400	7 year	7.750%	MS + 549
Air France-KLM	NR / NR	Jun-14	EUR 600	7 year	3.875%	MS + 285
Ryanair	NR / BBB+	Jun-14	EUR 850	7 year	1.875%	MS + 85
WestJet	NR / BBB-	Jul-14	CAD 400	5 year	3.287%	MS + 133
Lufthansa	Ba1 / BBB-	Sep-14	EUR 500	5 year	1.125%	MS + 75
American	B1 / B	Sep-14	USD 750	5 year	5.500%	MS + 351

- Includes USD, EUR, CAD issues with term between 5 and 10 years.
- Amounts in millions of issue currency
- Spread over mid-swaps at issuance
- Ratings are corporate family ratings (CFR) of the airline on the date of bond issue (some ratings since changed; in some cases specific bond ratings differ from overall CFR)
- For Avianca yield is reported (bond issued at 104.50 with coupon 8.375% for 7.44% yield)

Unsecured Bond Issuance in 2014 vs. ASU Secured Pricing



- When Moody's and S&P disagree on CFR rating, we choose the higher rating to produce a more conservative comparison with ASU.
- Air France–KLM is unrated. For the purpose of comparison with ASU we used BB (average of several internal financial institution ratings we are aware of).
- ASU Bond: ASU MPR (as of Q3 2014) + Bond Spread Benchmark.

Airline CDS Spreads

	Credit Rating		11-Sept-2014 CDS USD bps		
Airline	S&P	Moody's	5 YR	7YR	10YR
Southwest	BBB-	Baa2	58	80	109
All Nippon	NR	NR	89	119	146
Air France	NR	NR	107	133	152
Lufthansa	BBB-	Ba1	113	147	167
Emirates	NR	NR	142	168	190
British Airways	BB	B1	175	221	247
Delta	BB-	Ba3	225	254	279
United Cont.	B	B2	265	248	257
Qantas	BB+	Ba2	284	334	372
Jetblue	B	B2	305	322	336
SAS	B-	B3	525	511	552

➤ CDS Source: JP Morgan / Bloomberg. CDS typical liquidity in the tens of millions (notional). Larger notional may require breaking up in several transactions and/or additional premiums to these quotes.

AWG Submissions to the OECD

Comparing the 2011 Aircraft Sector Understanding and Current Market Pricing

as assessed by AWG's independent technical expert in 2013

The Aviation Working Group (AWG) participated in two stakeholders' consultations at the OECD in 2013, one on 28 February 2013, the other on 21 November 2013 (the **OECD-organized consultations**). A primary purpose of the OECD-organized consultations was to assess the relationship between the Aircraft Sector Understanding of 2011 and current commercial and capital markets, given the objective of ensuring a proper relationship between them.

To facilitate that assessment, AWG submitted materials to the OECD, and, through it, to the governments participating in the Aircraft Sector Understanding of 2011.

These materials included two studies by AWG's independent technical expert, Professor Vadim Linetsky, Ph.D, of Northwestern University.

AWG attaches these two studies hereto for general information. As AWG submitted these materials to the OECD on a confidential basis, by posting them on the AWG website, AWG waives that confidentiality. That waiver applies only to the materials attached hereto.

This action is based on resolution of AWG agreed at its general meeting in London on 22 May 2014, and is taken following consultations with the OECD and Professor Linetsky.

A Framework for Dynamic Assessment of ASU 2011 vs. Commercial Markets Pricing*

Vadim Linetsky, Ph.D.
Professor, Northwestern University
Independent Technical Advisor, AWG

Discussion Document
for the OECD ASU Consultation with Stakeholders
28 February 2013, Paris

***Disclaimer:** Any opinions, findings, conclusions or recommendations expressed in this material are those of the author, Prof. Linetsky, expressed in his private individual capacity, do not necessarily reflect the views of the AWG or its individual members, Northwestern University, or any other 3rd parties, and are based on work and analysis completed to date and subject to change as additional data become available. No warranty or liability of any kind is assumed.

Executive Summary

- **Bank Loans vs. ASU:** Based on our Bank Loan Bid Exercise (mock RFP) conducted in December 2012/January 2013, as of Q4 2012 bank loan financing is broadly comparable to the ECA financing under ASU 2011 for airlines with investment grade credit ratings. For lower credit ratings, bank median bids in our RFP Exercise are more expensive than ASU 2011 ECA, with the pricing differential increasing with decreasing credit rating, while bank lower bids in our RFP Exercise are slightly more expensive than ASU 2011.
- **EETC vs. ASU:**
 1. Based on our analysis of EETC issuance by US airlines in 2012, EETC spreads unadjusted for the differences in LTV and WAL are broadly comparable on average to ASU 2011 Pricing.
 2. According to our **Comparison Model** based on J.P. Morgan Master Model Current Market Value LTVs on the EETC side, and the application of LTV-reducing Risk Mitigants on the ECA side, ECA financing under ASU 2011 is substantially more expensive than EETC issuance by US airlines in 2012. The precise numerical magnitude of the advantage of EETC vs. ECA financing is predicated on the proxy used for the aircraft net purchase price in a EETC and the choice of risk mitigants in an ECA transaction.
 3. Caution is needed in making inferences from US EETC data to global markets. Further study is needed, and will be conducted as more EETC issues by non-US airlines become available.
- **Market Segmentation** between the bank loan market and capital markets observed at present time based on the results of our Bank Loan Bid Exercise and EETC analysis may possibly be explained by the fact that at present banks are navigating a new regulatory, capital adequacy, and liquidity environment post-crisis, while capital markets investors are seeking yield in the low interest rate environment.
- **Proposal for a Market Observatory:** The present document provides a point-in-time comparison of ASU 2011 with commercial markets. Since the ASU 2011 pricing system is dynamic and changing with the market, a more comprehensive picture would be provided by an on-going assessment process (Market Observatory) performed over time at regular intervals (such as semiannually) going forward.

Summary: ASU vs. Commercial Markets Q4 2012

➤ **ASU 2011**: ASU 2011 MPR (Q4 2012) plus Margin Benchmark (Q4 monthly average)

➤ **ASU 2011 CTC**: with CTC discount

➤ **ASU 2007**: ASU 2007 large aircraft (Category 1) fees converted to annual spreads plus Margin Benchmark (Q4 monthly average)

➤ **ASU 2007 CTC**: with CTC discount

➤ **7Y CDS**: Airline CDS spreads as of 4-Jan-2013 (Source: JP Morgan, Bloomberg)

➤ **7Y CDS + MB**: Airline CDS spreads + Margin Benchmark (proxy synthetic unsecured loan spread)

➤ **EETC 2012 Issuance**: Composite spreads over swap rates (matched to WAL) for 2012 EETC issues calculated at issuance.

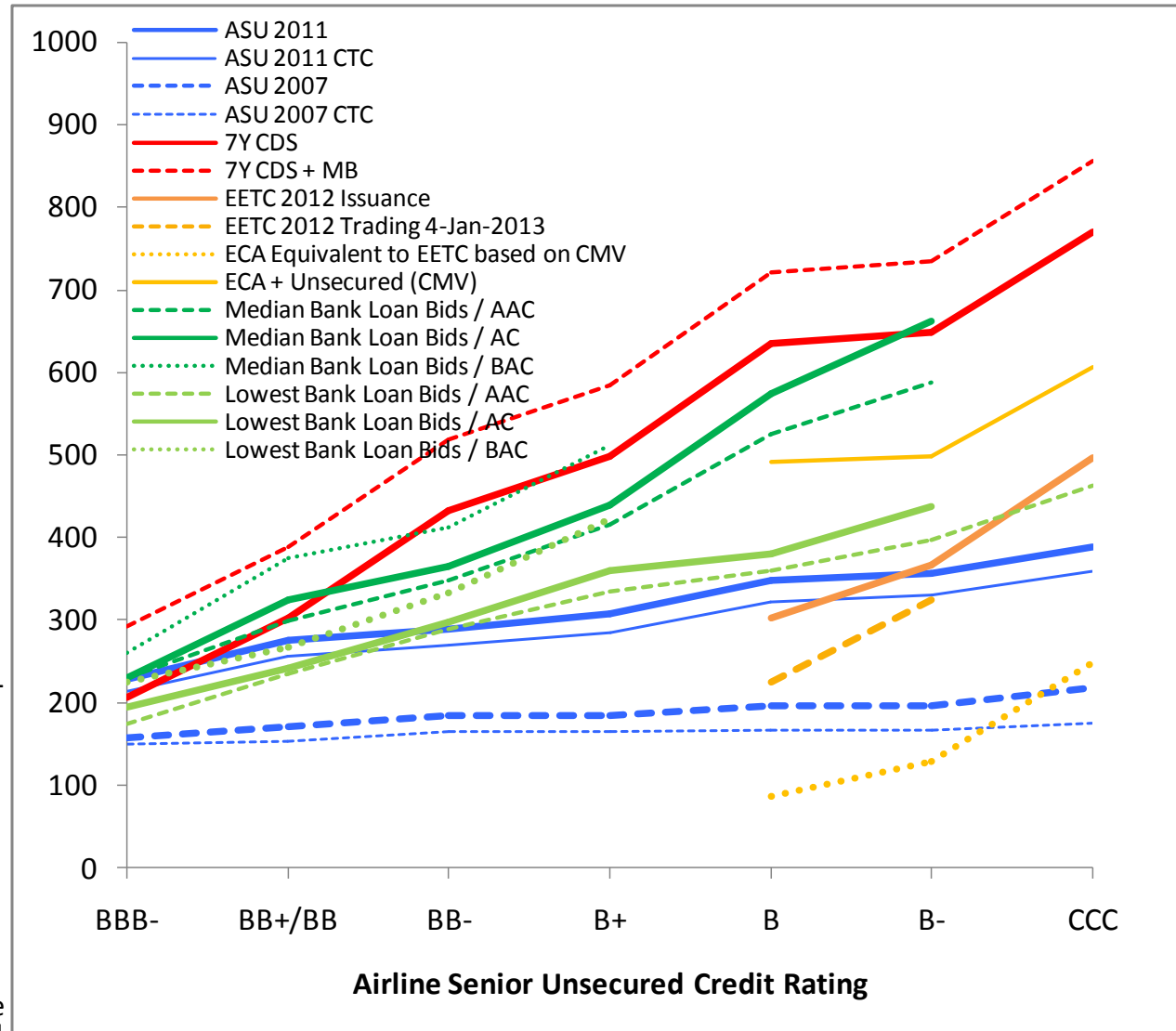
➤ **EETC 2012 4-Jan-2013**: Composite spreads over swap rates for 2012 EETC issues based on secondary market yields as of 4-Jan-2013.

➤ **ECA Equivalent to EETC based on CMV**: Implied MPR + MB such that the total cost of financing to the airline (ECA guaranteed loan + unsecured financing for LTV and WAL difference with EETC) is equal to the EETC composite spread. LTV based on JP Morgan Master Model (March 2012) Current Market Value Appraisals

➤ **ECA + Unsecured (CMV)**: Composite spread for ECA guaranteed loan at ASU 2011 MPR + MB and unsecured financing for the LTV and WAL difference between ECA and EETC (based on CMV)

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

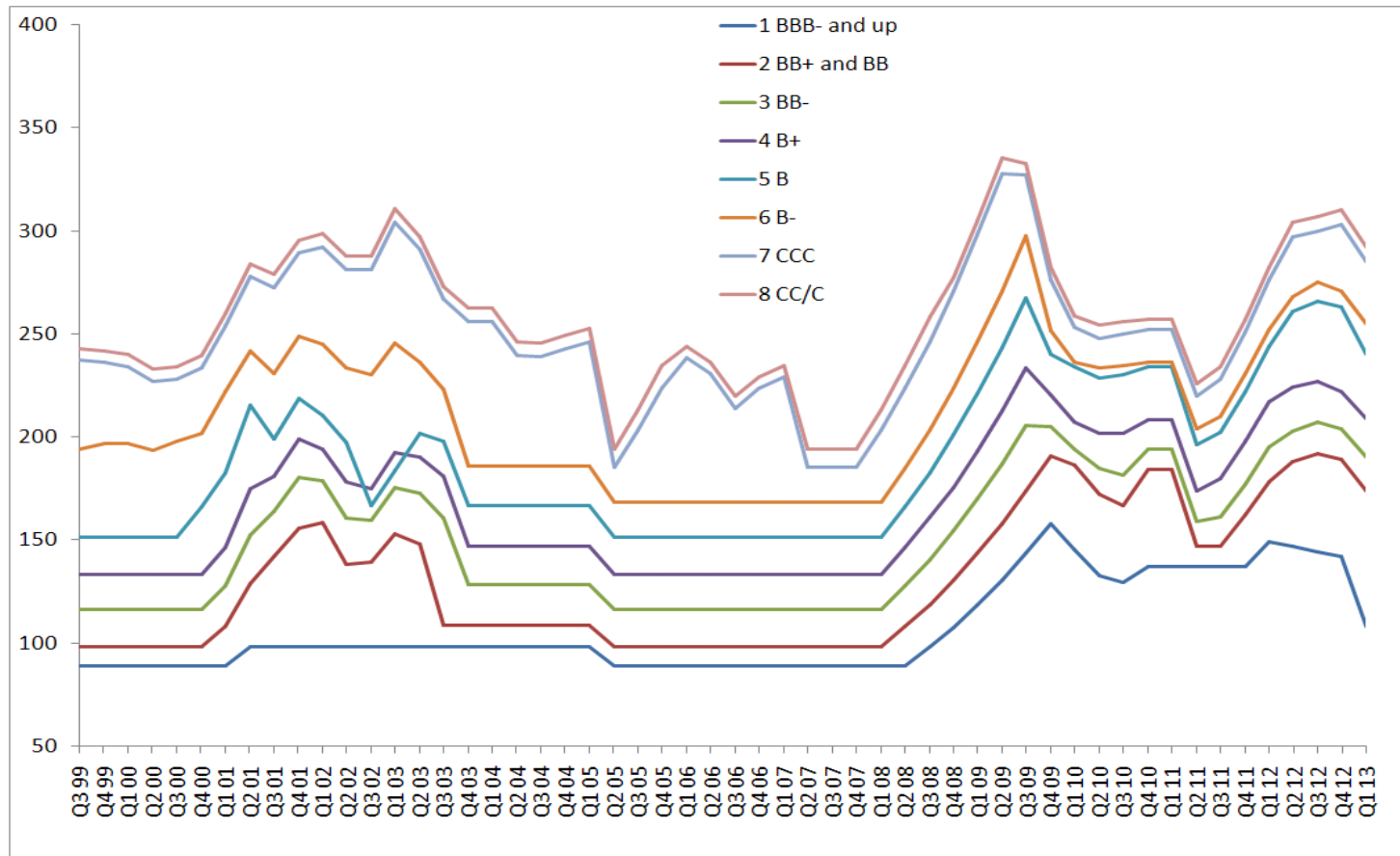
➤ **Lowest Bank Loans Bids / AAC, AC, BA**: Average of Two Lowest Bank Exercise Bids



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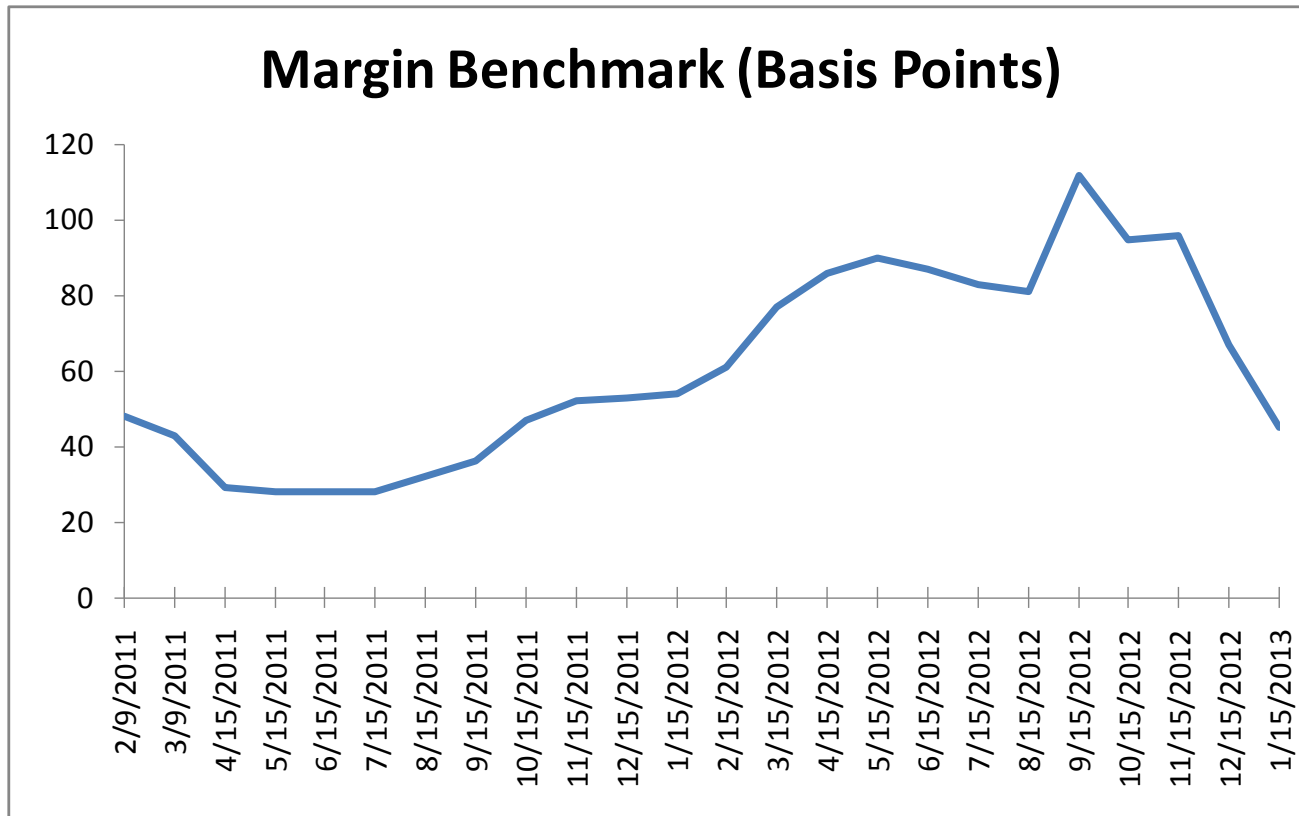
- **I. Preliminaries: Review of ASU 2011 Pricing Adjustments**
- **II. ASU / Commercial Markets Comparison: Bank Loan Bid Exercise**
- **III. ASU / Commercial Markets Comparison: 2012 EETC Issues**
- **IV. Unsecured Benchmarks: Current Airline CDS Spreads**
- **V. A Framework for Dynamic Assessment of ASU vs. Commercial Market Pricing**
- **Annex. Review of ASU 2011**

Historical MPR Simulation Q3 1999 through Q4 2010 and Actual MPR Adjustments Q1 2011 through Q1 2013



- Historical simulation of ASU 2011 MPRs from Q3 1999 to Q4 2010 conducted by Dr. Linetsky.
- Actual MPR adjustments from Q1 2011 to Q1 2013.
- **ASU 2011 is a dynamic pricing system indexed to the corporate bond market** through Market Reflective Surcharge (MRS).
- **Volatility over the full market cycle:** the range from low MPRs (in 2007) to high MPRs (financial crisis of 2008/9) has been approximately 70% to 80%.

Margin Benchmark (Source: OECD)



- **MB** is the rate equal to the average of the lowest 50% of the margins over LIBOR or Swap rates charged in commercial markets for ECA-guaranteed (pure cover) transactions in the preceding three months. Updated monthly by the OECD.
- **MB + MPR** is the spread over LIBOR or Swap for ECA-guaranteed transactions, taking into account both the ECA risk fee and the average commercial liquidity premium over LIBOR or Swap rates.
- **Airline's cost of financing with ECA support = LIBOR + MB + MPR.**
- In future analysis it may also be of interest to separate out capital markets margin benchmarks (ECA guaranteed bonds) and commercial bank loan margin benchmarks.

II. ASU / Commercial Markets Comparison: Bank Loan Bid Exercise

- In December / January Dr. Linetsky conducted an **ASU – Bank Loan Bid Comparison Exercise**.
- Developed a **Loan Term Sheet** paralleling ASU 2011 terms and a **Bid Chart** for a mock RFP.
- 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)
- Lenders active in aircraft finance developed a **reference document** with representative airlines placed in each of the ASU credit categories and representative aircraft with assumed purchase prices placed in each of the three collateral categories.
- Bid due date was Jan 9, 2013.
- **Six (6) major financial institutions submitted in confidence their Bid Charts to Prof. Linetsky by the deadline (6 Exercise Bidders).**
- 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.

EXERCISE BID CHART / TERM SHEET

				All-in Margin, bps per annum		
Loan Terms				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.

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 LIBOR 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 will accept for this hypothetical loan (meaning that your institution would not do this transaction for a lower margin).
- 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 the Bid Exercise and Comparison with 2011 ASU

- This 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 5 bids, the median bid is the 3rd 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 3rd and 4th highest bids). Median can be used as a measure of location for skewed distributions, such as the bid distribution, and is robust in small samples. Median bid represents a median bidder in the bid exercise, with half of the bidders bidding below and half of the bidders bidding above.
- We required at least 4 bids for a credit rating / collateral type combination to compute the median. We required at least 3 bids to report the average of the two lowest bids.
- While the median bid best represent 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 actually 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 purposes (equal to 4th Q 2012 MPR plus Margin Benchmark in effect 15 Dec 2012 through 15 Jan 2013)

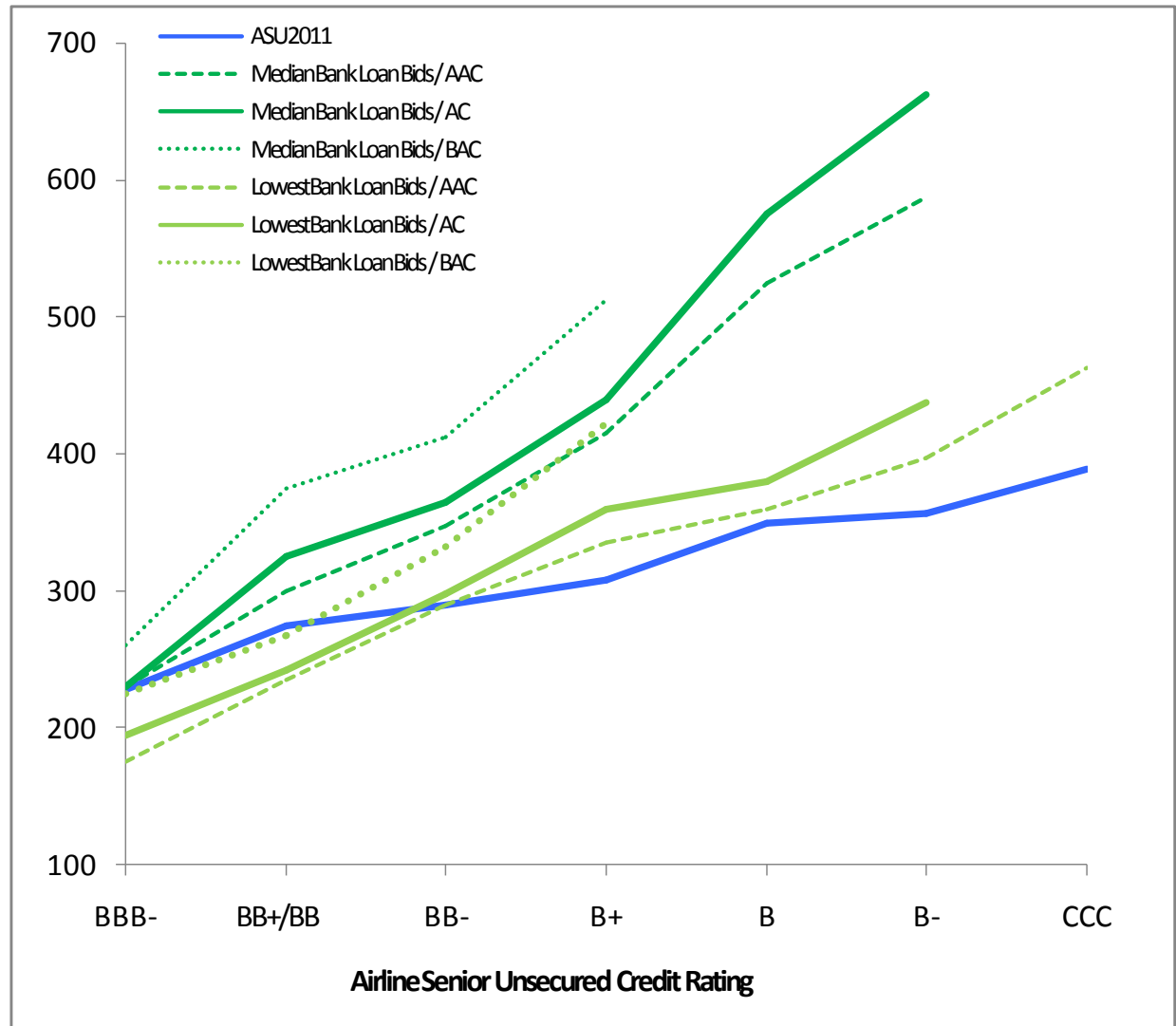
Risk Category	ECA (MPR+MB)	Number of Bids	Median Bid	Median vs. ECA % Difference	Average of 2 lowest bids	2 lowest vs. ECA % Difference
Above Average Collateral						
1	228	5	230	0.9%	175	-23.2%
2	275	5	300	9.1%	235	-14.5%
3	290	6	348	19.8%	290	0.0%
4	308	6	415	34.7%	335	8.8%
5	349	4	525	50.4%	360	3.2%
6	357	4	588	64.6%	398	11.3%
7 & 8	389	3			463	18.9%
Average Collateral						
1	228	5	230	0.9%	195	-14.5%
2	275	5	325	18.2%	243	-11.8%
3	290	6	365	25.9%	298	2.6%
4	308	6	440	42.9%	360	16.9%
5	349	4	575	64.8%	380	8.9%
6	357	4	663	85.6%	438	22.5%
7 & 8	389	2				
Below Average Collateral						
1	228	5	260	14.0%	225	-1.3%
2	275	5	375	36.4%	268	-2.7%
3	290	6	413	42.2%	333	14.7%
4	308	4	513	66.4%	423	37.2%
5	349	2				
6	357	2				
7 & 8	389	2				

ASU 2011 Q4 2012 vs. Bank Loan Bid Exercise

➤ **ASU 2011**: ASU 2011 MPR (Q4 2012) plus Margin Benchmark

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

➤ **Lowest Bank Loans Bids / AAC, AC, BA**: Average of Two Lowest Bank Bids



III. ASU / Commercial Markets Comparison Exercise: 2012 EETC Issues

- Analyzed all 2012 US EETC issues collateralized with new aircraft :
 - CAL 2012-1 (AB), 2012-2 (AB) and 2012-3 (C)
 - US Airways 2012-1 (ABC), 2012-2 (AB)
 - Have not considered DAL 2012-1 because collateral fleet includes vintages from 1995 to 2002 – not comparable to ASU new aircraft loans.
- For each issue computed composite (across all tranches with the same collateral) WAL, LTV and Spread over the swap rate with matched WAL (at issuance).
- LTVs in this document are **JP Morgan Master Model (JPM MM) Current Market Value (CMV) LTVs** (January 2013 Edition).

EETC / ASU Comparison Model

- Comparison with ASU 2011 ECA loans was made for each EETC issue. **In each case, ECA WAL and LTV (with risk mitigants) under ASU 2011 were lower than EETC WAL and LTV.** In the comparison it was assumed that all A risk mitigants are 5% LTV reductions and B risk mitigants are security deposits approximately equivalent to 2.5% LTV reduction.
- **“Specific choice of RMs is an ECA decision.” Sources: Ex-Im Bank and European ECAs.** This comparison assumes the ECA chooses LTV reducing risk mitigants. This is a reasonable assumption in view of the fact that ASU 2011 gives ECAs the prerogative to request LTV-reducing risk mitigants. If an ECA chooses different risk mitigants in a *particular* transaction does not change the fact that it has the prerogative to insist on LTV reduction if this is what it deems appropriate. We also note that, according to our prior analysis of Loss-Given-Default and LTV profiles over the life of the ECA loan, the effects of the three A-type risk mitigants on reducing ECA’s risk, while not completely equivalent, are largely comparable.
- **Comparison Model (CM)** assumes that the airline borrows the LTV difference at the unsecured rate (unsecured bullet financing). Maturity of the unsecured loan is chosen to make the composite debt structure (ECA + unsecured loan for LTV difference) match composite EETC WAL (across all tranches). For CAL, UAL CDS rates on the date of the EETC issue were used as the proxy unsecured rate (swap corresponding to WAL + CDS rate corresponding to WAL + margin benchmark). For US Air, CDS were not available, so we used Moody’s MCS with the same corporate credit rating and WAL as proxy. The CM assumes that the ECA fixed rate loan rate is equal to 7-year swap rate + Margin Benchmark published by the OECD + ASU 2011 MPR (effective at the time of EETC issuance). Margin Benchmarks were added to CDS or MCS spreads to arrive at all-in unsecured loan spreads.
- **CM answers two questions:**
 - (1) Determine **spread over swap** for the airline to achieve the same LTV and WAL for the ECA loan with additional unsecured financing as achieved under the EETC financing.
 - (2) 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

- ASU 2011 LTVs are based on certified net [purchase prices \(PP\)](#), not 3rd party appraisals.
- Comparable LTVs cannot be computed for EETCs because of [unavailability of PP](#).
- **In the absence of 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 3rd 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.
- This document presents a comparison based on JPM MM LTVs. Other LTV 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.
- To illustrate the differences in appraisals and the difficulties in ascertaining aircraft values for the purposes of establishing precise quantitative comparison between EETC and ASU in the absence of purchase prices, we note that JPM MM EETC **LTVs based on their Current Market Value (CMV) appraisals are 25% to 29% higher than LTVs based on prospectus Base Value (BV) appraisals** for the EETC issues analyzed in the present document.
- We deliberately made a choice for the purpose of this comparison to assume that the LTV difference is financed at the unsecured rate, rather than use cost of equity.
- Cost of equity is not easy to ascertain, and comparison results are sensitive to this input. To illustrate the difficulties, Prof. A. Damodoran's (NYU, Stern) current estimate (Jan 2013) for the cost of equity in the Air Transport industry is [7.73%](http://pages.stern.nyu.edu/~adamodar/) (<http://pages.stern.nyu.edu/~adamodar/> click on "Data", scroll down to "Discount Rate Estimation" and further on to "Cost of Capital by Industry Sector"). In contrast, some alternative studies use assumed [15%](#) cost of equity. By using unsecured debt rates in the present study we avoid having to make any assumptions about airlines' cost of equity and profitability.
- 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.*

CAL 2012-1,2,3

Combined Collateral pool: 35 Boeing 737-924ER, 7 Boeing 787-8 / Moody's Continental Credit Rating: B2									
	Issue Date	Face	WAL	Coupon	Spread	4-Jan-13 Yield	4-Jan-13 Spread	BV LTV	CMV LTV
2012-1A	22-Mar-12	\$ 753,035,000	9.2	4.15%	1.95%	3.44%	1.62%	54.1%	69.8%
2012-1B	22-Mar-12	\$ 139,103,000	5.7	6.25%	4.73%	4.73%	3.63%	64.1%	81.8%
2012-1AB		\$ 892,138,000	8.6	4.38%	2.28%	3.58%	1.87%	64.1%	81.8%
2012-2A	3-Oct-12	\$ 711,622,000	9.2	4.00%	2.45%	3.28%	1.46%	53.8%	68.0%
2012-2B	3-Oct-12	\$ 132,266,000	6	5.50%	4.55%	4.68%	3.51%	63.8%	79.7%
2012-2AB		\$ 843,888,000	8.6	4.17%	2.72%	3.44%	1.73%	63.8%	79.7%
2012-3C	27-Dec-12	\$ 425,000,000	5.3	6.125%	5.20%	5.96%	4.95%	79.6%	99.3%
2012-1,2,3		\$ 2,161,026,000	7.95	4.52%	3.03%	3.84%	2.25%	79.6%	99.3%

- Two issues of A and B tranches in March and October each + single C tranche issue in December (for the combined aircraft pool)
- CMV LTV: Current Market LTV from JP Morgan Master Model (pages 178-184 January 2013 Edition)
- BV LTV: prospectus base value (BV) LTV (JPM MM pages 178-184 January 2013 Edition)
- WAL: weighted average life
- Coupon: prospectus coupon
- Spread: over the corresponding swap rate on the issue date (weighted averages of swap rates across dates used for composite spreads across multiple issue dates). For multiple tranches equals to the composite spread calculated as the IRR of the composite financing.
- 4-Jan-13 Yield: secondary market trading yields as of 4-Jan-13 (Source: Deutsche Bank)
- 4-Jan-13 Spread: Spread = Yield – Swap rate with tenor matched to WAL on 4-Jan-2013

US Airways 2012-1 and 2

Collateral pool: 14 A321-200 / Moody's US Air Credit Rating at Issuance 14-May 12: Caa1									
	Issue Date	Face	WAL	Coupon	Spread	4-Jan-13 Yield	4-Jan-13 Spread	BV LTV	CMV LTV
2012-1A	14-May-12	\$379,785,000	8.1	5.90%	4.29%	4.42%	2.80%	52.2%	70.5%
2012-1B	14-May-12	\$124,958,000	6.3	8%	6.67%	6.47%	5.22%	69.4%	91.1%
2012-1C	14-May-12	\$118,636,000	2.6	9.125%	8.43%	7.37%	6.90%	85.7%	110.6%
2012-1A,B,C		\$623,379,000	6.8	6.43%	4.97%	4.94%	3.58%	85.7%	110.6%
Collateral pool: 7 A321-200, 4 A330-200 / Moody's US Air Credit Rating at Issuance 13-Dec-12: B3									
	Issue Date	Face	WAL	Coupon	Spread	4-Jan-13 Yield	4-Jan-13 Spread	BV LTV	CMV LTV
2012-1A	13-Dec-12	\$418,113,000	8.3	4.625%	3.15%	4.32%	2.67%	55.4%	72.4%
2012-1B	13-Dec-12	\$128,071,000	7	6.75%	5.50%	6.20%	4.79%	72.3%	92.6%
2012-1A,B		\$546,184,000	8	5.08%	3.66%	4.72%	3.12%	72.3%	92.6%

- May issue: US Airways had a Caa1 (CCC+) corporate family rating (CFR) from Moody's.
- December issue: Moody's upgraded US Airways CFR in November to B3 (B-).
- CMV LTV: LTV from JP Morgan Master Model (pages 133-136 January 2013 Edition)
- BV LTV: prospectus base value (BV) LTV (JPM MM pages 133-136 January 2013 Edition)
- 4-Jan-13 Yield: secondary market trading yields as of 4-Jan-13 (Source: Deutsche Bank)
- For explanation of other notation see Slide 15 CAL EETC

Comparison Model Results (JPM CMV Based)

		CAL 2012-1,2,3	LCC 2012-1	LCC 2012-2
		B	CCC+	B-
EETC	WAL	8	6.8	8
	JPM CMV LTV	99.3%	110.6%	92.6%
	Spread	3.03%	4.97%	3.66%
ASU 2011 ECA (with CTC)	WAL	6.7	6.7	6.7
	ASU LTV w/ RMs	77.5%	67.5%	72.5%
	MPR	2.31%	2.67%	2.44%
	Marg B	0.89%	0.86%	0.96%
ECA + Unsecured	Spread	3.20%	3.53%	3.40%
	Composite Spread	4.92%	6.07%	4.98%
	Equivalent MPR	0%	1.37%	0.38%

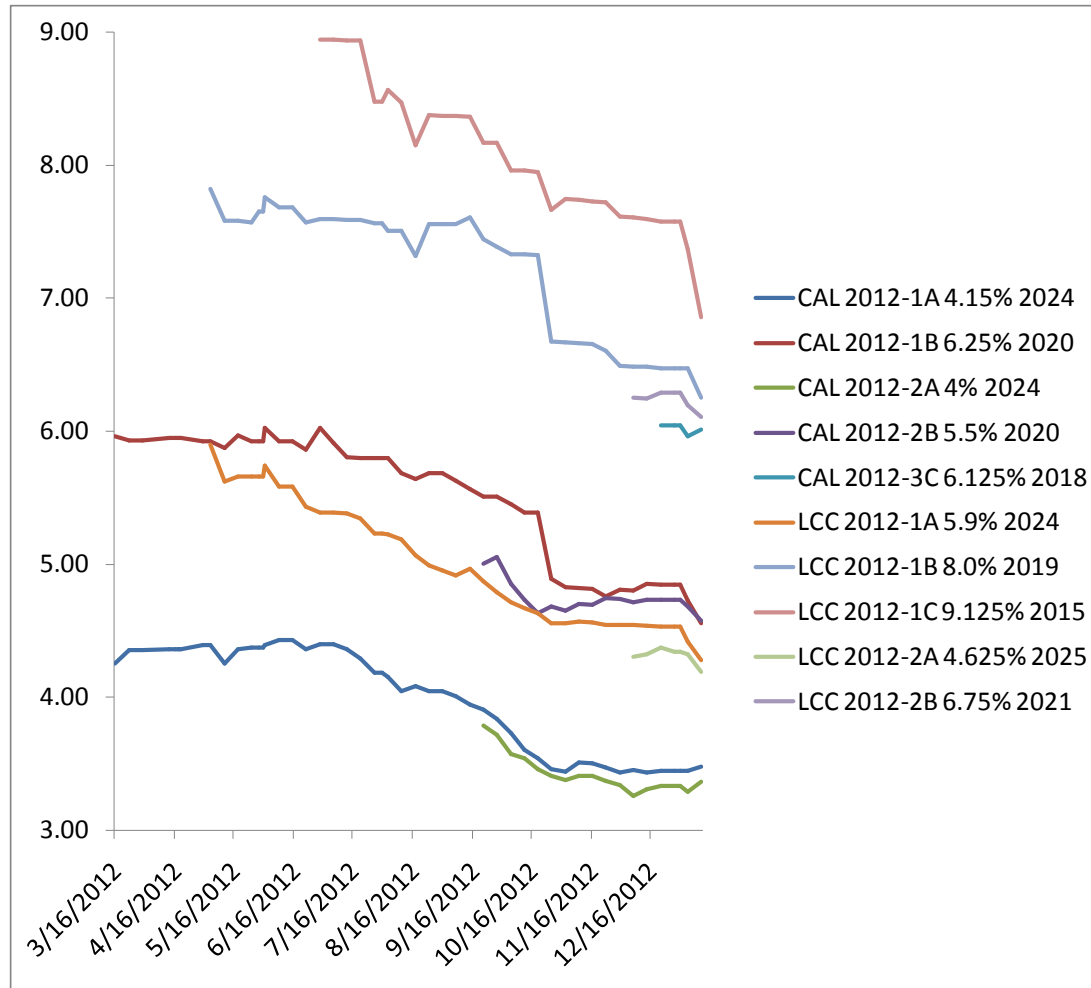
- MPR are with 10% CTC discount (CTC comparable to Section 1110). ASU Spread = MPR + Margin Benchmark (MB) at the time of issuance (or average across tranche issue dates).
- ECA + Unsecured: assumes the airline finances the difference in LTVs under EETC and ASU ECA loan at the unsecured rate with unsecured financing with maturity such that WAL of the composite financing (ECA + unsecured) is equal to the EETC WAL. CDS rates are used as proxy for unsecured rates for CAL. Moody's median credit spreads (MCS) are used as proxy for US Air unsecured rates. Margin Benchmark (MB) is added to CDS and MCS to obtain all-in proxy unsecured loan spread.
- Composite Spread is calculated on the composite financing (ECA + unsecured).
- Equivalent MPR (with 10% CTC discount) is such MPR (with 10% CTC discount) that makes the Composite Spread for ECA + unsecured financing equal to the EETC composite spread.

Unsecured Spreads used in Comparison Model

Airline	Rating		EETC	CLOSE DATE	5 YR	7 YR	10 YR
	SP	Moody's				CDS	
United Continental	B	B2	CAL 12-1	3/22/2012	792	828	831
United Continental	B	B2	CAL 12-2	10/3/2012	744	727	700
United Continental	B	B2	CAL 12-3	12/27/2012	649	679	686
						MCS	
US Airways	B-	Caa1	LCC 12-1	5/14/2012	857	896	943
US Airways	B-	B3	LCC 12-2	12/13/2012	656	697	743

- CDS rates are used as a proxy for unsecured financing rates for CAL.
- Moody's Median Credit Spreads (MCS) for the corresponding rating grades are used as a proxy for US Airways unsecured rates due to unavailability of CDS quotes.
- Margin Benchmark was added to these spreads in the Comparison Model to arrive at all-in proxy spreads for unsecured loans.

Secondary Market Trading: 2012 EETC Historical Yields



- Source: Deutsche Bank
- **Current yields on 2012 EETC tranches are substantially lower than at issuance earlier in 2012. Using current yields in the ASU 2012 / EETC Comparison exercise would result in even stronger advantage of EETC financing over ECA ASU 2011 financing.**

ASU 2011 Q4 2012 vs. US EETC Issuance in 2012

➤ **ASU 2011:** ASU 2011 MPR (Q4 2012) plus Margin Benchmark (Q4 monthly average)

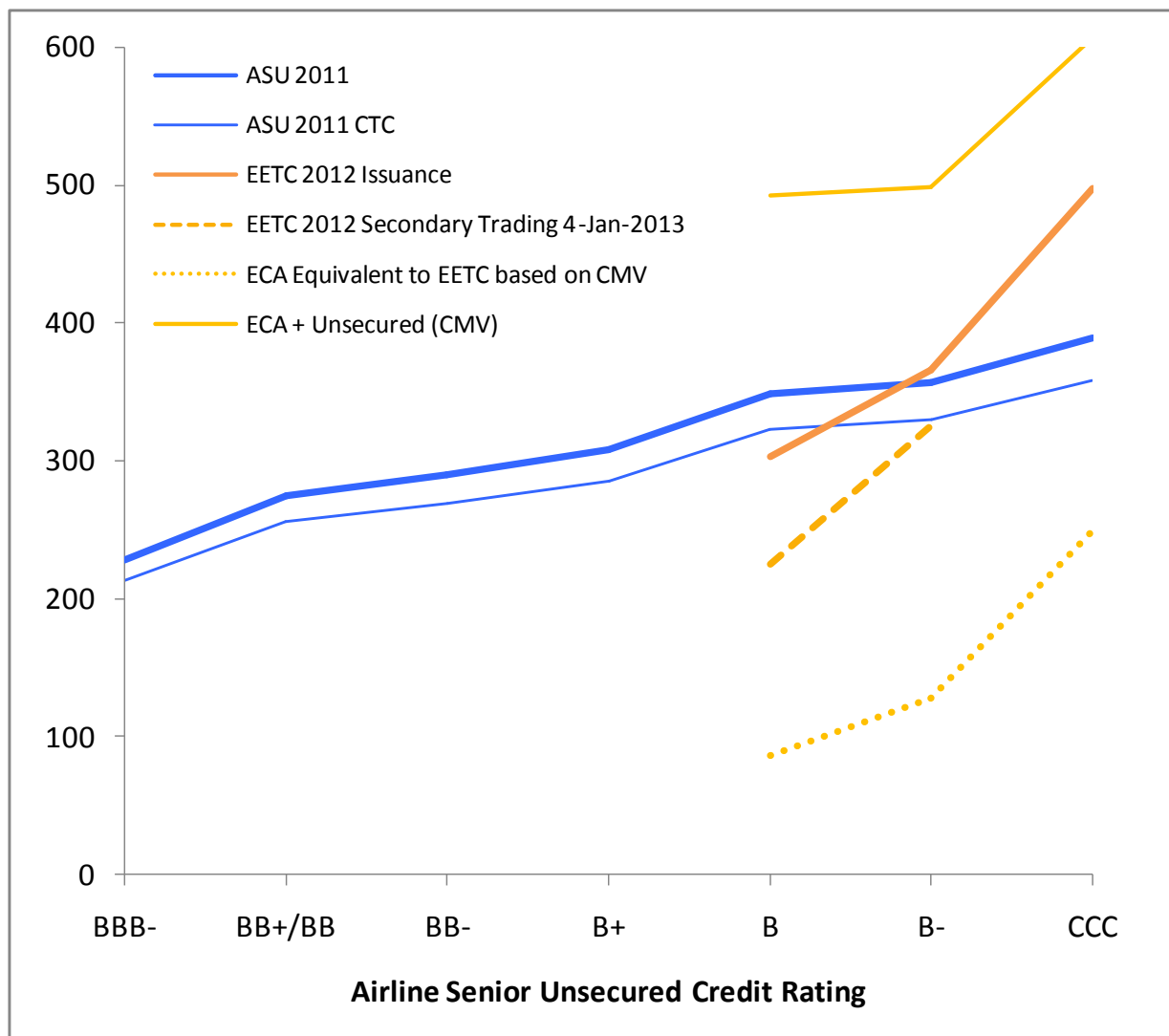
➤ **ASU 2011 CTC:** with CTC discount

➤ **EETC 2012 Issuance:** Composite spreads over swap rates (matched to WAL) for 2012 EETC issues calculated at issuance.

➤ **EETC 2012 4-Jan-2013:** Composite spreads over swap rates for 2012 EETC issues based on secondary market yields as of 4-Jan-2013.

➤ **ECA Equivalent to EETC based on CMV:** Implied MPR + MB such that the total cost of financing to the airline (ECA guaranteed loan + unsecured financing for LTV and WAL difference with EETC) is equal to the EETC composite spread. LTV based on JP Morgan Master Model (March 2012) Current Market Value Appraisals

➤ **ECA + Unsecured (CMV):** Composite spread for ECA guaranteed loan at ASU 2011 MPR + MB and unsecured financing for the LTV and WAL difference between ECA and EETC (based on CMV)



IV. Unsecured Benchmarks: 4-Jan-2013 Airline CDS Spreads

Airline	Credit Rating		4-Jan-2013 CDS USD, bps p.a.		
	S&P	Moody's	5 YR	7YR	10YR
Southwest	BBB-	Baa3	121	163	189
Lufthansa	BBB-	Ba1	148	181	199
Qantas	BBB-	Baa3	240	274	288
All Nippon	NR	NR	240	261	276
Emirates	NR	NR	265	297	309
British Airways	BB	B1	449	498	523
Air France	NR	NR	549	601	604
United Cont.	B	B2	613	635	641
Delta	B	B2	626	635	629
Jetblue	B-	B3	646	648	642
SAS	CCC+	Caa1	809	770	728

- Source: JP Morgan / Bloomberg
- Typical liquidity in the tens of millions (notional)
- Larger notional may require breaking up in several transactions and/or additional premiums to these quotes
- Can be used to **hedge unsecured debt** – counterpart to ECA guarantees that insure secured debt
- Can serve as **proxy for unsecured debt spreads over LIBOR: All-In Unsecured Debt Spread = CDS Spread + Margin Benchmark**
- Can be used to **hedge secured debt to a given LGD projection**. Simplified example: assume 16% LGD on secured debt and 80% LGD on unsecured debt. CDS with tenor equal to WAL and \$20 notional hedges \$100 of secured debt. Correspondingly, 20% of the CDS spread hedges secured debt to the given LGD projection.
- In Jan 2013 Emirates issued \$750 million unsecured bonds with 7 year WAL at 300 bps over 7 year swap – close to their CDS.

V. A Framework for Dynamic Assessment of ASU 2011 vs. Commercial Markets

- The present document provides a point-in-time comparison of the current ASU 2011 and commercial markets as of Q4 2012.
- **Proposal for a Market Observatory:** Since the ASU 2011 pricing system is dynamic and changing with the market, a more comprehensive picture would be provided by an **on-going assessment process (market observatory)** performed over time at regular intervals (such as semiannually) going forward.
- Such a market observatory, if put in place, would track export credit pricing vs. commercial market pricing through changing market conditions and provide a valuable resource to all stakeholders.

Assessment of ASU 2011 vs. Commercial Markets Pricing in 2013*

Vadim Linetsky, Ph.D.

Professor, Northwestern University

Independent Technical Advisor, AWG

6 November 2013 Draft

Discussion Document

for the OECD ASU Consultations with Stakeholders

21 November 2013, Paris

***Disclaimer:** Any opinions, findings, conclusions or recommendations expressed in this material are those of the author, Prof. Linetsky, expressed in his private individual capacity, do not necessarily reflect the views of the AWG or its individual members, Northwestern University, or any other 3rd parties, and are based on work and analysis completed to date and subject to change as additional data become available. No warranty or liability of any kind is assumed.

Executive Summary

I. Comparison of ASU 2011 and Commercial Markets Pricing in Q3 2013: Point in Time Analysis

- According to our Second Bank Bid Exercise (BBE 2), ASU 2011 pricing is broadly consistent with the current commercial bank loan pricing.
- US airlines' (AMR, HA, UAL, US Air) and Air Canada EETCs have more favorable terms (WAL, LTV) and materially better pricing than ASU 2011. British Airways 2013-1 pricing is comparable to ASU. DNA 2013-1 pricing is materially higher than ASU.

II. Comparison of ASU 2011 and Commercial Markets Pricing: Over Time Analysis from Q4 2012 to Q3 2013

- ASU MPR adjustment mechanism consistently tracked commercial bank loan and EETC markets during this period. Bank loan and EETC pricing decreased by approximately 25% on average vs. 19% decrease in MPRs.

Detailed Executive Summary: Q3 2013 Exercise Results

I. Second Bank Bid Exercise vs. ASU:

1. The average of two lowest bids for average aircraft collateral is 1.3% higher than ASU MPR + ECA Bank Funding Margin Benchmark for Cats 1-6 on average, and 22% higher for Cats 7 and 8. For above average collateral, the average of two lowest bids is 4% lower than ASU for Cats 1-6 and 15% higher than ASU for Cats 7-8. For below average collateral, the average of two lowest bids is 16% higher than ASU for Cat 1-6 and 27% higher for Cats 7-8.
2. Minimum premium rates (MPRs) for Cats 2-8 decreased by 19% on average due to lower corporate bond spreads. MPR for Cat 1 decreased by a larger 31% due to the reduction of the Market Reflective Surcharge (MRS) for Cat 1 below 25 bps (MRS of less than 25 bps is not added to RBR according to the ASU). In comparison, the average of two lowest bids in BBE 2 decreased by 26% on average across all risk categories and collateral types relative to BBE 1. This constitutes a somewhat larger reduction in spreads than the average 19% reduction in MPRs from Q4 2013 to Q3 2013. The ASU MPR adjustment mechanism consistently tracked the bank loan market during this period.

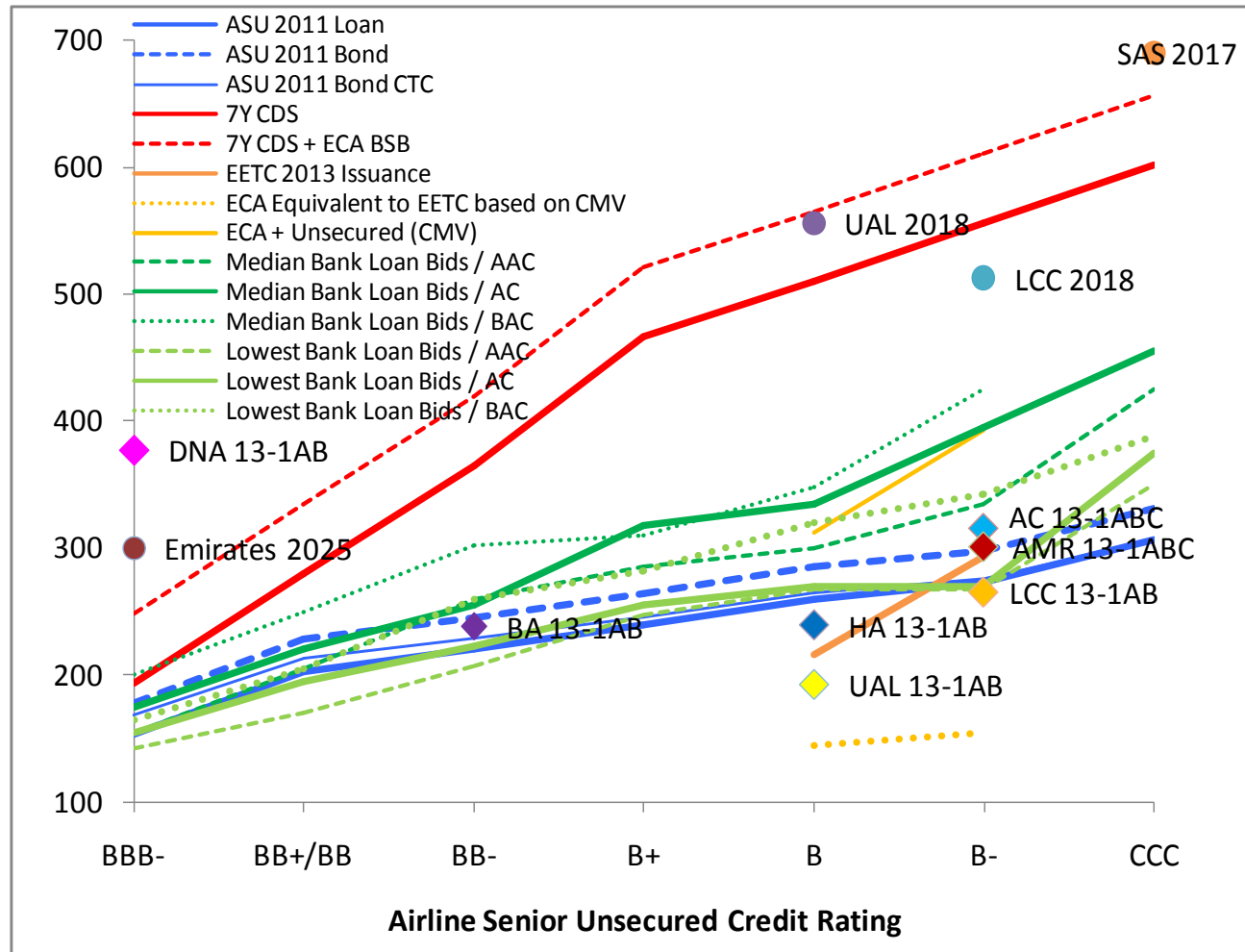
II. EETC 2013 issuance vs. ASU:

1. EETC spreads of Air Canada, American, Hawaiian, United, US Airways unadjusted for the differences in LTV and WAL are broadly comparable to the current ASU 2011 Pricing. Air Canada priced consistently with US airlines.
2. All four US EETCs and Air Canada have more favorable terms (longer WAL, higher LTV) than the ASU terms. According to our Comparison Model based on LTVs computed from J.P. Morgan Master Model current market value (CMV) aircraft appraisals on the EETC side, and the application of LTV-reducing risk mitigants on the ECA side, ECA financing under ASU 2011 is materially more expensive than EETC financing by North American airlines in 2013. Our estimates of the overall EETC advantage over ECA financing under the ASU range from 74 to 114 bps per annum for North American airlines based on JPM aircraft CMV appraisals. The precise numerical relationship between EETC vs. ECA financing is predicated on the proxy used for the aircraft net purchase price for the LTV calculation.
3. British Airways 2013-1 terms are comparable to ASU (approximately the same WAL, JPM aircraft CMV appraisal-based LTV slightly lower than ASU LTV for Cat 3). BA pricing was also comparable to ASU.
4. The average spread across all tranches issued by US airlines, AC and BA decreased by 24% relative to the average spread across all tranches issued in 2012, which constitutes a larger decrease than the 19% decrease in MPRs.
5. DNA 2013-1 had higher LTV than ASU Cat 1, but shorter WAL and materially higher spread over swaps.
6. More data outside of US, Canada and U.K. are needed to make general inferences about non-US / Canada/ U.K. airline EETC issues.

Technical Note: In this exercise we replaced the Margin Benchmark with the ECA Bank Funding Margin Benchmark (BFMB) and the ECA Bond Spread Benchmark for the purposes of comparing ASU 2011 with commercial bank loans and EETC, respectively.

Point in Time Summary: ASU vs. Commercial Markets Q3 2013

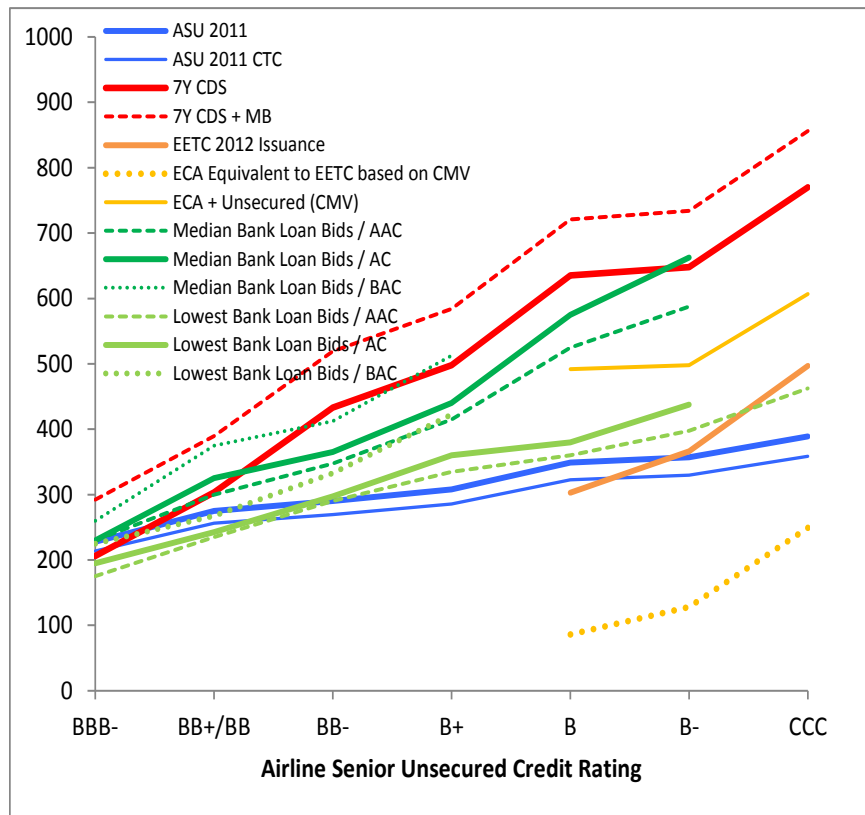
- **ASU 2011 Loan:** ASU 2011 MPR (Q3 2013) plus ECA Bank Funding Margin Benchmark over LIBOR (BFMB)
- **ASU 2011 Bond:** ASU 2011 MPR (Q3 2013) plus ECA Bond Spread Benchmark over interpolated mid-swaps (BSB)
- **ASU 2011 Bond CTC:** with CTC discount
- **7Y CDS:** Airline CDS spreads as of 20-Sept-2013 (Source: JP Morgan, Bloomberg)
- **7Y CDS + BFMB:** Airline CDS spreads + BFMB (proxy synthetic unsecured loan spread)
- **Unsecured bond spreads over interpolated mid-swaps matched to WAL at issuance:** Emirates 2025, LCC 2018, SAS 2017, UAL 2018
- **Median Bank Loan Bids / AAC, AC, BA:** Bank Bid Exercise Medians with Above Average Collateral (AAC), Average Collateral (AC), Below Average (BAC)
- **Lowest Bank Loans Bids / AAC, AC, BA:** Average of Two Lowest Bank Bids
- **EETC 2013 Issuance:** Composite spreads over interpolated mid-swaps matched to WAL for 2013 EETC issues calculated at issuance. Averages for B and B- include HA, UAL and AC, AMR, LCC, respectively. Individual EETC issues also shown
- **ECA + Unsecured (CMV):** Composite spread for ECA guaranteed financing with ASU 2011 MPR + BSB and unsecured financing for the LTV and WAL difference between ECA and EETC (based on CMV)
- **ECA Equivalent to EETC based on CMV:** Implied MPR + BSB such that the total cost of financing to the airline (ECA guaranteed financing + unsecured financing for LTV and WAL difference with EETC) is equal to the EETC composite spread. LTV based on JP Morgan Master Model (April 2013) Current Market Value aircraft appraisals.



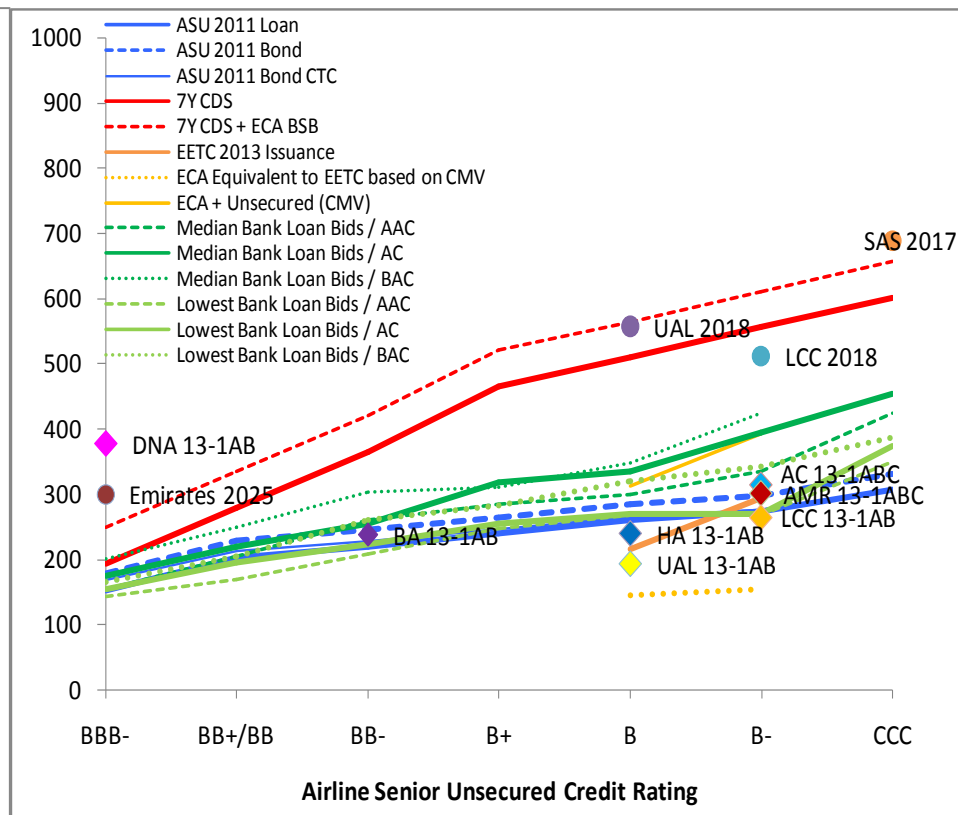
Over Time Summary: Comparison of Exercises 1 and 2

Side by side comparison in the same scale shows that all spreads have contracted by comparable percentages.

Q4 2012



Q3 2013

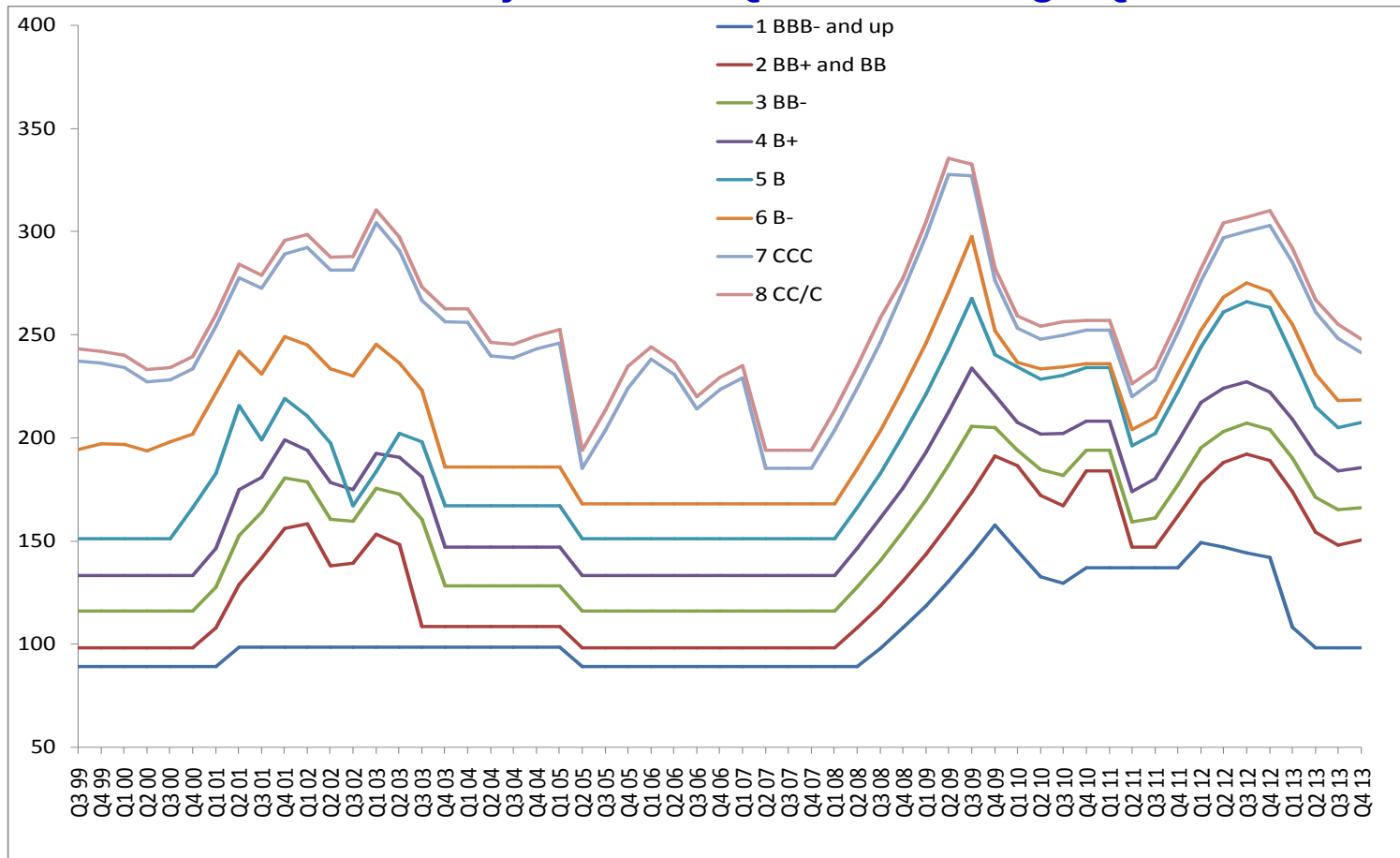


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- **I. Review of ASU 2011 Pricing: 2013 Update**
- **II. ASU 2011 vs. Commercial Markets Comparison: 2nd Bank Bid Exercise**
- **III. ASU 2011 vs. Commercial Markets Comparison: 2013 EETC Issuance**
- **IV. Unsecured Benchmarks: Airline CDS Spreads and Unsecured Bonds**

I. Review of ASU 2011 MPR Adjustments: 2013 Update

Historical MPR Simulation Q3 1999 through Q4 2010 and Actual MPR Adjustments Q1 2011 through Q4 2013



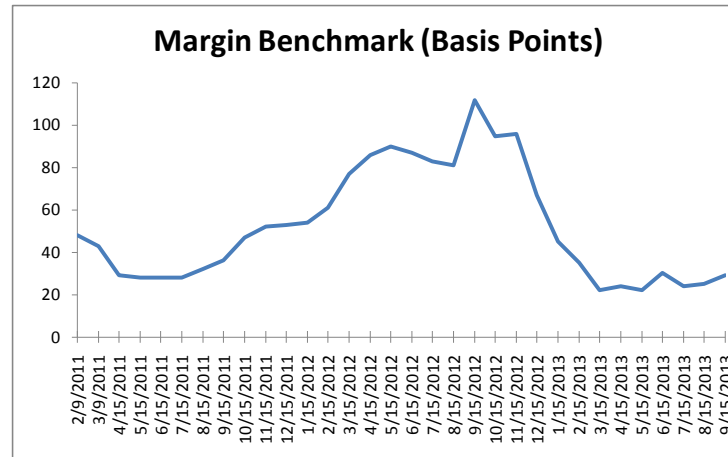
- Historical simulation of ASU 2011 MPRs from Q3 1999 to Q4 2010 conducted by Dr. Linetsky.
- Actual MPR adjustments from Q1 2011 to Q4 2013.
- **ASU 2011 is a dynamic pricing system indexed to the corporate bond market** through Market Reflective Surcharge (MRS). **Volatility over the full market cycle:** the range from low MPRs (in 2007) to high MPRs (financial crisis of 2008/9) has been approximately 70% to 80%.

Q3 2013 vs. Q4 2012 MPR Comparison

	MPR		
Cat	Q4 2012	Q3 2013	% Change
1	142	98	-31%
2	189	148	-22%
3	204	165	-19%
4	222	184	-17%
5	263	205	-22%
6	271	218	-20%
7	303	248	-18%
8	310	255	-18%
Cat 2-8 Average:			-19%

- Minimum premium rates **(MPRs) for Cats 2-8 decreased by 19% on average** due to lower corporate bond spreads.
- **MPR for Cat 1 decreased by a larger 31%** due to the reduction of the Market Reflective Surcharge (MRS) for Cat 1 below 25 bps (*MRS of less than 25 bps is not added to RBR according to the ASU 2011*).

Spreads on ECA Guaranteed Bonds and Loans and OECD Margin Benchmark (MB)



- **MB** is the rate equal to the average of the lowest 50% of the margins / spreads over LIBOR in commercial markets for ECA-guaranteed (pure cover) transactions in the preceding three months. Updated monthly by the OECD. **Changes in MB computation methodology have occurred since November 2012 OECD meeting. These changes, along with other features of MB make it inadequate for the purpose of comparison with BBE and EETC. In this exercise we replace MB with two separately constructed benchmarks for the purposes of comparison with BBE and EETC.** Reasons for replacing MB:
 - 1. According to our understanding, equivalent spreads over LIBOR for Ex-Im and European ECA guaranteed bonds on a cash flow swapped, LIBOR-equivalent basis are now included in the MB calculation. In particular, for those financings that start as bank loans and are later re-financed into the capital markets as bonds, LIBOR-equivalent spreads for bonds are now reported after their re-financing into the capital markets. This constitutes a change from the earlier practice. According to our understanding, another change from the earlier practice is switching from spreads over interpolated mid-swaps to LIBOR-equivalent spreads on ECA bonds. While these changes are technically justified, they have lowered the MB relative to the earlier part of the time series.
 - 2. Since Ex-Im bonds tend to have lower spreads than European ECA guaranteed bonds and loans (when kept on the banks' books), as well as Ex-Im guaranteed loans that are kept on the books, Ex-Im bonds currently dominate the MB calculation, since the latter includes only the 50% lowest spreads over LIBOR. Thus, due to the 50% lowest rule, MB neither currently reflects the cost of financing via ECA guaranteed bank loans that are kept on the books, nor via European ECA guaranteed bonds.
 - 3. According to our understanding, the margin benchmark does not currently reflect the stepped up interest rate that commercial banks sometimes charge, which can be higher than the introductory rate that the bank may be offering for the first 6 or 12 months and reflects the rate at which the commercial bank is willing to hold the ECA guaranteed loan long term on the books.

Spreads on ECA Guaranteed Bonds and Loans

- In this exercise we replace the MB with two separately constructed benchmarks for the purposes of comparison with BBE and EETC.
- **1. For our 2013 EETC comparison exercise we use the average spread over interpolated mid-swaps matched to WAL across both Ex-Im and European ECA guaranteed bonds as the appropriate comparison benchmark for fixed-rate capital markets transactions.** We call it **ECA Bond Spread Benchmark (BSB)**. This is an appropriate benchmark for comparing EETCs with ECA bond financing in our exercise, since we also compute spreads over interpolated mid-swaps for EETCs.
- **2. To establish a benchmark for our Bank Bid Exercise, we conducted a separate ECA Bank Bid Exercise, requesting bids for margin over LIBOR on Ex-Im and EU ECA guaranteed ASU complaint loans from a panel of commercial banks active in funding ECA guaranteed loans.** We received bids from four (4) banks for this exercise. We use the **average of two lowest bank bids over LIBOR on both Ex-Im and European ECA guaranteed loans as the comparison benchmark for our BBE**. We call it **ECA Bank Funding Margin Benchmark (BFMB)**. This is an appropriate benchmark for comparing BBE with ECA bank loan financing, as it involves only bank loans.
- **Using these two separate benchmarks, we consistently compare bonds with bonds (EETC with ECA bonds) and commercial loans with commercial loans. This separation was originally suggested by an airline as feedback to our 1st ASU exercise, and later suggested by a bidder in our 2nd Bank Bid Exercise. This change implemented in the 2nd Exercise constitutes a refinement to our ASU / commercial markets comparison methodology.**

ECA Bond Spread Benchmark

- We examined a data set of ECA guaranteed bonds issued in 2013:
 - **Ex-Im:** 34 issues. Average spread over interpolated mid-swaps matched to WAL **52 bps**. (Average LIBOR-equivalent spread 30 bps.)
 - **ECGD:** 6 issues. Average spread to interpolated mid-swaps matched to WAL: **95 bps**. (Average LIBOR-equivalent spread 68 bps.)
 - **Coface:** 3 issues. Average spread over interpolated mid-swaps matched to WAL: **120 bps**. (Average LIBOR-equivalent spread 89 bps.)
- In our comparison of the cost of EETC and ECA financing, we use the **average of Ex-Im spreads and EU ECA spreads** = $(52 + (95+120)/2)/2 = 80 \text{ bps over interpolated mid-swaps matched to WAL (ECA Bond Spread Benchmark)}$. (The corresponding LIBOR-equivalent spread is = $(30+(68+89)/2)/2 = 54 \text{ bps}$.)
- **Technical note: difference between spreads over interpolated mid-swaps matched to WAL and LIBOR-equivalent spreads**

Spreads over interpolated mid-swaps matched to WAL on a fixed-rate instrument are computed by approximating the repayment profile with a WAL-matched bullet and swapping it at the interpolated WAL-matched mid-swap rate. For a 12 year ECA bond, a more precise analysis requires swapping fixed interest on each of the 48 principal payments in the 12 year mortgage-style principal amortizing profile into LIBOR. The difference between the spread obtained via this precise calculation and the WAL-matched approximation depends on the shape of the swap curve (in particular, the difference between the front end of the curve with tenors shorter than WAL and the long end of the curve with tenors longer than WAL). In 2013 it was in the 20 to 30 bps range for Ex-Im bonds. In our EETC / ASU comparison exercise we consistently used spreads over interpolated mid-swaps matched to WAL for *both* ECA-guaranteed bonds and EETCs, using the same metrics on both legs (ECA bond and EETC).

ECA Bank Funding Margin Benchmark

- Four (4) Exercise Bidders submitted bids for margin over LIBOR on Ex-Im and EU ECA guaranteed bank loans.
- **Ex-Im** average margin over LIBOR: 49 bps. Average of two lowest margins: **40 bps.**
- **EU ECA** average margin over LIBOR: 90 bps. Average of two lowest margins: **70 bps.**
- Average margin over LIBOR across **Ex-Im and EU ECA bank loans**: 69 bps. Average of two lowest margins: **55 bps.** This is our **ECA Bank Funding Margin Benchmark** for comparison with our BBE. (We take the average of two lowest bids in the BFMB for consistency with our approach to asset backed loans in our BBE.)
- **Technical note:**
 - While ECA BFMB of 55 bps is lower than our ECA Bond Spread Benchmark of 80 bps, BSB is expressed as spread over interpolated mid-swaps matched to WAL on fixed-rate notes. The corresponding *LIBOR-equivalent* spread is 54 bps and is approximately equal to our BFMB of 55 bps. We also note that the BFMB of 55 bps over LIBOR is reflective of the *current* (as of end of October) bank loan market, while the BSB of 80 bps over interpolated mid-swaps is reflective of the *2013 year average* bond market.

II. ASU / Commercial Markets Comparison: Second ASU / Bank Bid Exercise

- In October Dr. Linetsky conducted a **2nd ASU / Bank Loan 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 4 October 2013.
- **Nine (9) major financial institutions active in aircraft finance submitted in confidence their Bid Charts to Prof. Linetsky (9 Exercise Bidders). Increase from 6 bidders in BBE 1.**
- 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.

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 LIBOR 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 the Bank Bid Exercise and Comparison with 2011 ASU

- This 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 4th 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 3rd and 4th highest bids). Median bid represents a median bidder in the bid exercise, with half of the bidders bidding below and half bidding above.
- We required at least 4 bids for a credit rating / collateral type combination to compute the median. We required at least 3 bids to report the average of the two lowest bids.
- While the median bid best represent 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 purposes and are equal to 3rd Q 2013 MPR plus ECA Bank Funding Margin Benchmark (55 bps, see page 12).**
- **The average of two lowest bids for average aircraft collateral is 1.3% higher than ASU MPR + ECA Bank Funding Margin Benchmark for Cats 1-6 on average, and 22% higher for Cats 7 and 8. For above average collateral, the average of two lowest bids is 4% lower than ASU for Cats 1-6 and 15% higher than ASU for Cats 7-8. For below average collateral, the average of two lowest bids is 16% higher than ASU for Cat 1-6 and 27% higher for Cats 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	153	8	155	1%	143	-7%
2	203	8	205	1%	170	-16%
3	220	7	260	18%	208	-6%
4	239	8	285	19%	248	4%
5	260	7	300	15%	268	3%
6	273	7	335	23%	268	-2%
7 & 8	307	5	425	39%	350	15%
Average Collateral						
1	153	8	175	14.4%	155	1.3%
2	203	8	220	8.4%	195	-3.9%
3	220	7	255	15.9%	223	1.1%
4	239	8	318	32.8%	255	6.7%
5	260	7	335	28.8%	270	3.8%
6	273	7	395	44.7%	270	-0.4%
7 & 8	307	4	455	48.5%	375	22.3%
Below Average Collateral						
1	153	8	200	30.7%	165	7.8%
2	203	8	250	23.2%	205	1.0%
3	220	8	303	37.5%	260	18.2%
4	239	6	310	30.8%	283	19.2%
5	260	4	348	33.7%	320	24.0%
6	273	4	425	55.7%	343	26.4%
7 & 8	307	3			388	27.3%

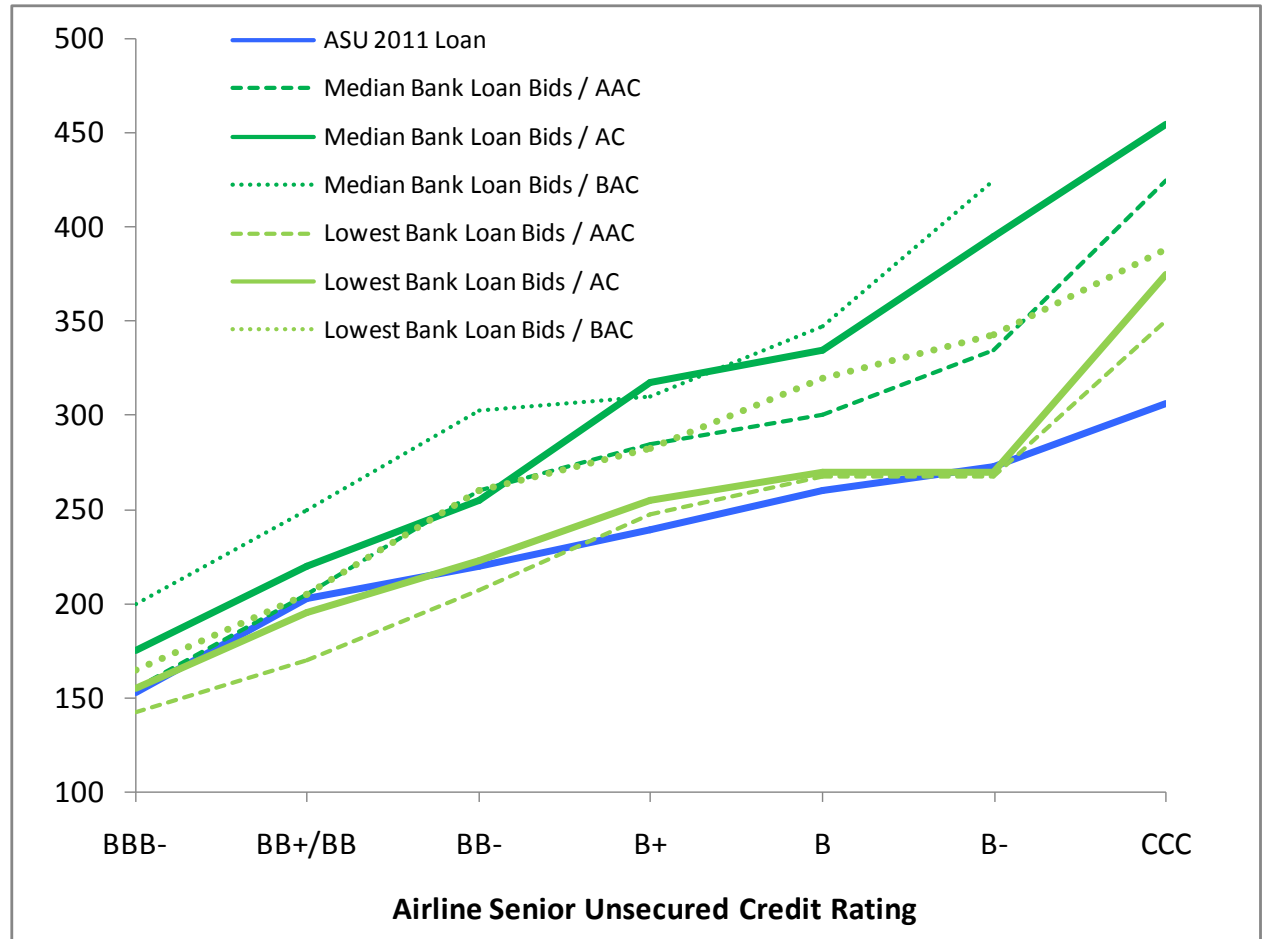
ASU 2011 Q3 2013 vs. Bank Loan Bid Exercise

➤ **ASU 2011 Loan:** ASU 2011 MPR (Q3 2013) plus ECA Bank Funding Margin Benchmark (55 bps).

➤ **Median Bank Loan Bids / AAC, AC, BA:** Bank Loan Bid Exercise 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

➤ **Lowest Bank Loan Bid / Average Collateral Curve (solid green) closely tracks the ASU curve (solid blue).**



Comparison with the First Bank Bid Exercise

➤ Comparison with 1st

BBE: the average of two lowest bids in BBE 2 is 26% lower on average across all risk categories and collateral types than in BBE 1.

➤ This is a greater reduction in spreads than the average 19% reduction in MPRs from Q4 2013 to Q3 2013, but is lower than the average reduction of 31% in the total cost of ASU ECA financing proxied by MPR plus MB.

➤ **The ASU MPR adjustment mechanism consistently tracked the bank loan market during this period.**

	Average of 2 Lowest Bids			Median Bids		
Risk Category	BBE 1 Jan-13	BBE 2 Oct-13	% Change	BBE 1 Jan-13	BBE 2 Oct-13	% Change
	Above Average Collateral			Above Average Collateral		
1	175	143	-19%	230	155	-33%
2	235	170	-28%	300	205	-32%
3	290	208	-28%	348	260	-25%
4	335	248	-26%	415	285	-31%
5	360	268	-26%	525	300	-43%
6	398	268	-33%	588	335	-43%
7 & 8	463	350	-24%	NA	425	
	Average Collateral			Average Collateral		
1	195	155	-21%	230	175	-24%
2	243	195	-20%	325	220	-32%
3	298	223	-25%	365	255	-30%
4	360	255	-29%	440	318	-28%
5	380	270	-29%	575	335	-42%
6	438	270	-38%	663	395	-40%
7 & 8	NA	375		NA	455	
	Below Average Collateral			Below Average Collateral		
1	225	165	-27%	260	200	-23%
2	268	205	-23%	375	250	-33%
3	333	260	-22%	413	303	-27%
4	423	283	-33%	513	310	-40%
5	NA	320		NA	348	
6	NA	343		NA	425	
7 & 8	NA	388		NA	NA	

III. ASU / Commercial Markets Comparison Exercise: 2013 EETC Issues

➤ US Issues:

- American 2013-1
- Hawaiian 2013-1
- United 2013-1
- USAir 2013-1

➤ Non-US Issues:

- Air Canada 2013-1
- British Airways 2013-1
- Emirates DNA Alpha 2013-1
- Virgin Australia 2013-1 not included in the analysis – aircraft are 2 to 10 years old.

- 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** (April 2013 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 star: no haircut, 4 star: 5% haircut, 3 star: 10% haircut, 2 star: 15% haircut, 1 star: 20% haircut; aircraft collateral in 2013 EETC issues ranges from 3 to 5 stars).

EETC / ASU Comparison Model

- Comparison with ASU 2011 ECA loans was made for each EETC issue. It was assumed that all A risk mitigants are 5% LTV reductions and B risk mitigants are security deposits approximately equivalent to 2.5% LTV reduction.
- **“Specific choice of RMs is an ECA decision.” Sources: Ex-Im Bank and European ECAs.** This comparison assumes the ECA chooses LTV reducing risk mitigants. This is a reasonable assumption in view of the fact that ASU 2011 gives ECAs the prerogative to request LTV-reducing risk mitigants. If an ECA chooses different risk mitigants in a *particular* transaction does not change the fact that it has the prerogative to insist on LTV reduction if this is what it deems appropriate. We also note that, according to our prior analysis of Loss-Given-Default and LTV profiles over the life of the ECA loan, the effects of the three A-type risk mitigants on reducing ECA’s risk, while not completely equivalent, are largely comparable.
- **ASU Risk Category Assumptions:** since ASU Risk Category ratings are confidential and not known to us, we estimated 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 used the higher of the two ratings (this leads to a more conservative comparison). If Moody’s and S&P disagree by two notches, we used the average of the two.
- **Comparison Model (CM)** assumes that the airline borrows the LTV difference at the unsecured rate (unsecured bullet financing). Maturity of the unsecured financing is chosen to make the composite debt structure (ECA + unsecured financing for LTV difference) match composite EETC WAL (across all tranches). For BA and UAL, CDS rates on the date of the EETC issue were used as the proxy unsecured rate (swap rate corresponding to WAL + CDS rate corresponding to WAL + ECA Bond Spread). For US Air and Air Canada, CDS were not available, and we used Moody’s MCS with the same corporate credit rating and WAL as proxy. The CM assumes that the ECA fixed rate loan rate is equal to 7-year swap rate + ECA Bond Spread + ASU 2011 MPR (effective at the time of EETC issuance). ECA Bond Spreads were added to CDS to arrive at all-in unsecured financing spreads.
- **ECA Bond Spread Benchmark in CM:** as discussed on pages 9 through 11, in this exercise we replaced the Margin Benchmark with ECA Bond Spread Benchmark computed as the average spread over interpolated swaps matched to WAL for Ex-Im and EU ECA guaranteed bonds (see page 11). When comparing specific EETC issues, ECA bond issues in the same month were included in the FM average.
- **CM answers three questions:**
 - (1) Determine **spread over swap** for the airline to achieve the same LTV and WAL for ECA financing with additional unsecured financing as achieved under the EETC financing.
 - (2) Establish **advantage of one form of financing over the other** (EETC over ASU loan or ASU loan over EETC) in basis points per annum.
 - (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 3rd 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 3rd 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.
- **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.*
- **Unsecured financing assumption and lower rated airlines:** Our comparison model assumes that the LTV difference is financed at the unsecured rate. This assumes availability of unsecured financing. In practice lower rated airlines may experience difficulties accessing such unsecured financing. This may make ECA financing under ASU 2011 unobtainable for airlines in lower risk categories due to their inability to raise down payments required to meet risk mitigants. We currently do not have the data to test this proposition.

2013 US Airlines EETC Summary

	Issue Date	Face	WAL	Coupon	Spread	BV LTV	CMV LTV
AMR: 4 New B777-323ER + 8 B737-823 (13 YO) + 1 B777-223ER (13 YO) / Chapter 11, Assumed ASU Cat 6							
2013-1A	5-Mar-13	\$506,746,000	8.2	4.00%	2.36%	54.8%	65.2%
2013-1B	5-Mar-13	\$156,632,000	5.9	5.625%	4.48%	71.7%	85.4%
2013-1C	30-May-13	\$119,800,000	5.1	6.125%	4.90%	85.0%	100.8%
2013-1ABC		\$783,178,000	7.3	4.53%	3.01%	85.0%	100.8%
Hawaiian 13-1: 6 New A330-243 / HA Moody's CFR B3, S&P B, Assumed ASU Cat 5							
2013-1A	14-May-13	\$328,260,000	9	3.90%	2.04%	53.2%	67.9%
2013-1B	14-May-13	\$116,280,000	6.9	4.95%	3.50%	72.0%	92.0%
2013-1AB		\$444,540,000	8.4	4.13%	2.39%	72.0%	92.0%
UAL 13-1: 18 New B737-924ER + 3 New B787-8 / UAL Moody's CFR B2, S&P B, Assumed ASU Cat 5							
2013-1A	1-Aug-13	\$720,315,000	9.1	4.30%	1.61%	55.1%	63.2%
2013-1B	1-Aug-13	\$209,036,000	5.9	5.375%	3.45%	71.0%	81.5%
2013-1AB		\$929,351,000	8.4	4.48%	1.93%	71.0%	81.5%
US Air 13-1: 14 New A321-231 + 4 New A330-243 / US Air Moody's CFR B3, S&P B-, Assumed ASU Cat 6							
	Issue Date	Face	WAL	Coupon	Spread	BV LTV	CMV LTV
2013-1A	10-Apr-13	\$620,095,000	8.5	3.95%	2.28%	54.3%	65.5%
2013-1B	10-Apr-13	\$199,518,000	7.2	5.375%	3.95%	72.1%	86.5%
2013-1AB		\$819,613,000	8.2	4.27%	2.65%	72.1%	86.5%

- CMV LTV: based on JPM Current Market Value appraisal of collateral aircraft (from JP Morgan Master Model April 2013 Edition pages 39-45). For all US airline EETC issues in 2013 CMV LTV is higher than ASU LTV (with risk mitigants).
- BV LTV: prospectus base value (BV) LTV.
- WAL: weighted average life. For all 2013 US airline EETC issues, WAL is longer than ASU WAL.
- Coupon: prospectus coupon. For multiple tranches blended coupon calculated as the IRR of the financing including all tranches.
- Spread: over the interpolate swap rate matched to WAL on the issue date (blended across dates when tranches issued on different dates).
- AMR is currently in Chapter 11. For the purpose of this exercise we assumed ASU Cat 6, anticipating B- rating.

2013 Non-US Airlines EETC Summary

	Issue Date	Face	WAL	Coupon	Spread	BV LTV	CMV LTV
Air Canada 13-1: 5 New 777-300ER / Air Canada Moody's CFR Caa1, S&P B-, Assumed ASU Cat 6							
2013-1A	30-Apr-13	\$ 424,389,000	9	4.125%	2.49%	48.9%	54.1%
2013-1B	30-Apr-13	\$ 181,881,000	6	5.375%	4.33%	69.5%	77.2%
2013-1C	30-Apr-13	\$ 108,264,000	5	6.675%	5.86%	82.3%	91.0%
2013-1ABC		\$ 714,534,000	7.6	4.54%	3.15%	82.3%	91.0%
BA: 6 A320-200 + 2 B777-300ER + 6 B787-8 (All New) / BA Moody's CFR B1, S&P BB, Assumed ASU Cat 3							
2013-1A	25-Jun-13	\$ 721,610,000	7.9	4.625%	2.21%	55.2%	59.5%
2013-1B	25-Jun-13	\$ 207,000,000	4.2	5.625%	4.27%	70.6%	76.5%
2013-1AB		\$ 928,610,000	6.8	4.57%	2.38%	70.6%	76.5%
Emirates DNA 13-1: 4 New A380-861 / Emirates Not Rated, Assumed ASU Cat 1							
2013-1A	27-Jun-13	\$ 462,000,000	5.7	5.250%	3.46%	50.6%	63.2%
2013-1B	27-Jun-13	\$ 168,000,000	3.8	6.125%	4.98%	69.0%	86.1%
2013-1AB		\$ 630,000,000	5.2	5.42%	3.77%	69.0%	86.1%

- Air Canada WAL is longer than ASU WAL, British Airways is approximately equal, and DNA is shorter.
- Air Canada and DNA CMV LTV are higher than ASU LTV, British Airways CMV LTV is slightly lower (based on JPM aircraft CMV appraisals).
- Moody's and S&P disagree by 2 notches on BA corporate rating (Moody's B1 vs. S&P BB). We assume Cat 3 (corresponding to the middle BB-).
- Emirates not rated. We assume Cat 1 based on Emirates CDS spreads that are in line with BBB-airlines.
- For notation see slide # 22 "US Airlines".

Comparison of 2013 vs. 2012 EETC Issuance

Tranche	2012	2013	% Change
A	296	217	-27%
B	536	400	-25%
C	682	538	-21%
		Average:	-24%

- This table shows average spreads over interpolated swaps matched to WAL in basis points per annum across all A tranches, B tranches, and C tranches for EETC issues in 2012 and 2013 (excluding DNA).
- The last column shows percentage change from 2012 to 2013.
- **Overall, the average spread across all tranches issued by US airlines, AC and BA decreased by 24% relative to the average spread across all tranches issued in 2012, which is a larger decrease than the 19% decrease in MPRs for Cats 2-8.**

Comparison Model Results (JPM CMV Appraisal Based)

	EETC	AMR 13-1ABC	HA 13-1AB	UAL 13-1AB	USAir 13-1AB	AC 13-1ABC	BA 13-1AB	DNA 13-1AB
	CFR Moodys/SP/ASU	Chpt 11/Cat 6	B3/B/Cat 5	B2/B/Cat 5	B3/B-/Cat 6	Caa1/B-/Cat 6	B1/BB/Cat 3	NR/NR/Cat 1
EETC	Issue Date	5-Mar-13	14-May-13	1-Aug-13	10-Apr-13	30-Apr-13	25-Jun-13	27-Jun-13
	WAL	7.3	8.4	8.4	8.2	7.6	6.8	5.2
	JPM CMV LTV	100.8%	92.0%	81.5%	86.5%	91.0%	76.5%	86.1%
	Spread over Swap	3.01%	2.39%	1.93%	2.65%	3.15%	2.38%	3.77%
ASU 2011 ECA	WAL	6.7	6.7	6.7	6.7	6.7	6.7	6.7
	ASU LTV w/ RM	72.5%	77.5%	77.5%	72.5%	72.5%	80.0%	80.0%
	CTC Discount	YES	YES	YES	YES	YES	NO	NO
	MPR	2.30%	1.94%	1.85%	2.30%	2.08%	1.71%	0.98%
	ECA BSB	0.78%	0.80%	0.88%	0.78%	0.78%	0.83%	0.83%
	All-in Spread	3.08%	2.74%	2.73%	3.08%	2.86%	2.54%	1.81%
EETC vs ASU 2011 ECA Analysis	EETC LTV - ASU LTV	28.30%	14.50%	4.00%	14.00%	18.50%	-3.50%	6.10%
		ECA + Unsec	ECA + Unsec	ECA + Unsec	ECA + Unsec	ECA + Unsec	EETC + Unsec	NA
	Composite Spread	4.15%	3.42%	2.83%	3.76%	3.89%	2.47%	3.77%
	EETC vs ASU Adv.	1.14%	1.03%	0.90%	1.11%	0.74%	0.07%	-1.97%
	Equivalent MPR	0.52%	0.45%	0.83%	0.70%	1.00%	2.17%	3.47%

- MPR for comparison with US EETCs are with 10% CTC discount (CTC comparable to Section 1110). For non-US issues the CTC discount eligibility is determined from the current eligibility list (as of Oct 2013) on the OECD web site.
- ASU All-in Spread = MPR + ECA BSB (as described on page 11) at the time of issuance (or average across tranche issue dates).
- ECA + Unsecured: assumes the airline finances the difference in LTVs under EETC and ASU ECA loan at the unsecured rate with unsecured financing with maturity such that WAL of the composite financing (ECA + unsecured) is equal to the EETC WAL. CDS rates at date of issue are used as proxy for unsecured funding rates for UAL and BA (plus BSB to obtain all-in proxy for unsecured funding rates). Moody's median credit spreads (MCS) with ratings corresponding to ASU risk categories are used as proxy for unsecured funding rates for AMR, HA, US Air and Air Canada.
- Composite Spread is calculated on the composite financing (ECA + unsecured for all airlines except BA and DNA; for BA ASU LTV is 3.5% higher than EETC LTV when using JPM aircraft CMVs -- the composite spread in the table shows composite EETC + unsecured financing to fund additional 3.5% LTV; for DNA EETC WAL is shorter at 5.2 years vs. 6.7 years under the ASU, while EETC LTV is 6.1% higher than 80% ASU LTV (when using JPM aircraft CMVs) – we approximated this as comparable trade off).
- Equivalent MPR (with 10% CTC discount) is such MPR (with 10% CTC discount) that makes the Composite Spread for ECA + unsecured financing equal to the EETC composite spread.

EETC / ASU Comparison Analysis

- EETC spreads of Air Canada, American, Hawaiian, United, US Airways unadjusted for the differences in LTV and WAL are broadly comparable to the current ASU 2011 pricing. Air Canada priced consistently with US airlines.
- All four US EETCs and Air Canada have more favorable terms (longer WAL, higher LTV) than the ASU 2011 terms. According to our Comparison Model based on LTVs computed from J.P. Morgan Master Model current market value aircraft appraisals on the EETC side, and the application of LTV-reducing risk mitigants on the ECA side, ECA financing under ASU 2011 is materially more expensive than EETC financing by North American airlines in 2013. Our estimates of overall EETC advantage over ECA financing under the ASU range from 74 to 114 bps per annum for North American airlines *based on JPM aircraft CMV appraisals*. The precise numerical relationship between EETC vs. ECA financing is predicated on the proxy used for the aircraft net purchase price for the LTV calculation. Different aircraft appraisals will lead to different LTVs and different numerical comparison conclusions.
- British Airways 2013-1 terms are comparable to ASU (approximately the same WAL, JPM aircraft CMV appraisal-based LTV slightly lower than ASU LTV for Cat 3). BA pricing was also comparable to ASU. Our comparison model shows that BA priced close to the ASU Cat 3 level (*based on JPM aircraft CMV appraisals*).
- BA priced substantially higher than US airlines and Air Canada earlier in 2013. Possible explanations of BA EETC pricing relative to US airlines and Air Canada:
 - 1) Timing – “QE tapering “ market scare led to substantial stress in the credit markets during the last week of June around the BA issue date. IAGLN senior unsecured 5-year CDS spreads spiked by nearly 150 bps from May through the end of June (source: Bloomberg). Industry sources estimate the timing of the BA 2013-1 issue has added 50-75 bps to BA spreads relative to the timing of several US and Air Canada issues priced early in the year.
 - 2) Absence of CTC put BA EETC at a material disadvantage relative to Air Canada and US airline issues. Industry sources estimate that the absence of CTC has added in the vicinity of 35 bps to BA spreads.
 - Controlling for these two factors, BA pricing would have been fully consistent with US and Air Canada EETCs.
- DNA 13-1 had better LTV than ASU Cat 1, but substantially shorter WAL and substantially higher spread. Composite coupon of DNA 13-1 A and B was 197 bps higher than Cat 1 MPR+BSB. [Technical note: on summary charts on pages 4 and 5 DNA 13-1 spread (at issuance) is plotted above Emirates 2025 unsecured bond spread (at issuance). We note the *timing difference* in these transactions. At the time of DNA 13-1 issue, the spread on Emirates 2025 bond in the secondary market trading was higher than the DNA 13-1 spread.]
- More data outside of US, Canada and U.K. are needed to make general inferences about non-US / Canada / U.K. airline EETC issues. Further analysis will be conducted as such data become available.

ASU 2011 Q3 2012 vs. EETC Issuance in 2013

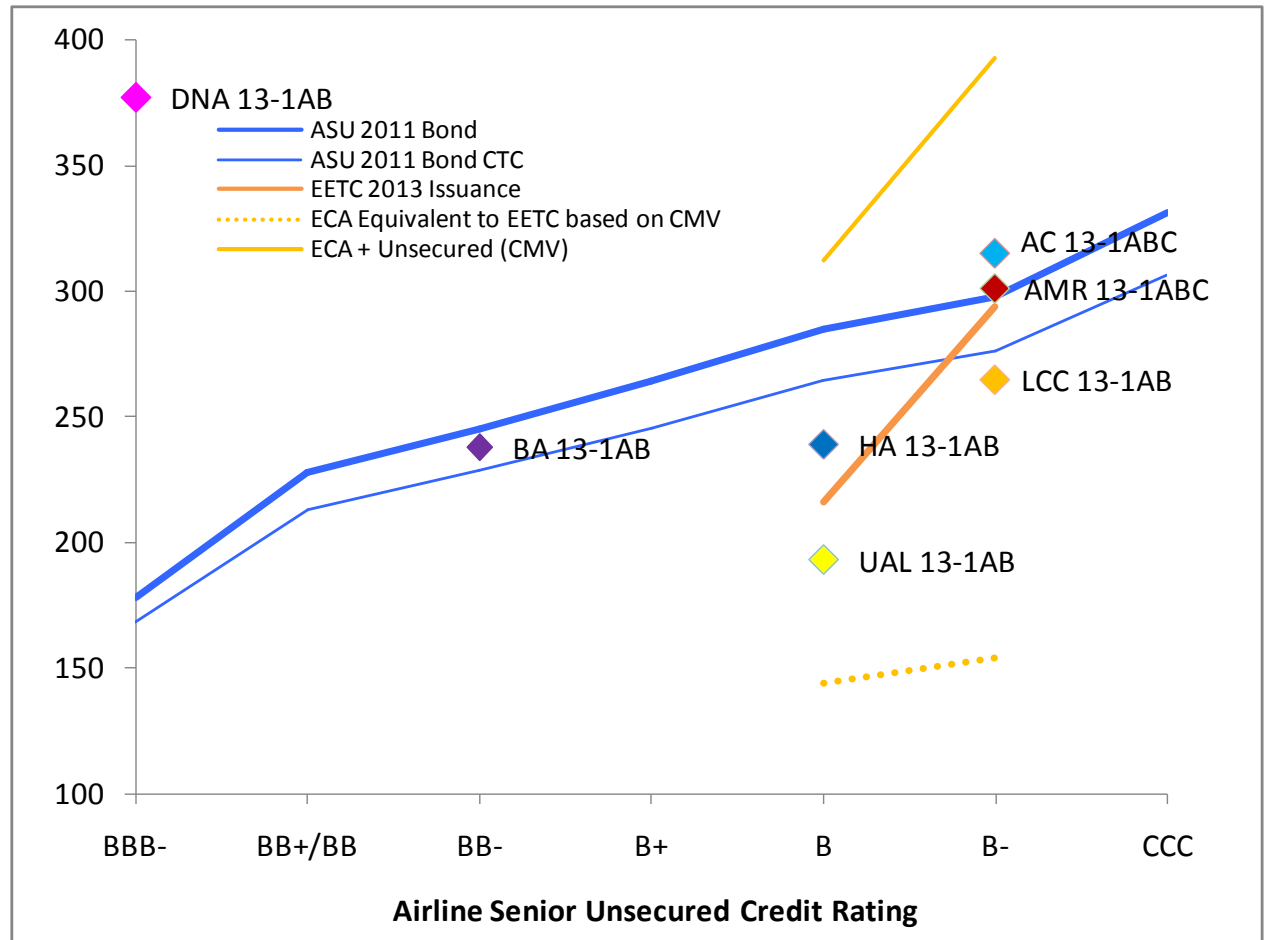
➤ **ASU 2011 Bond:** ASU 2011 MPR (Q3 2013) plus ECA Bond Spread Benchmark (from page 11)

➤ **ASU 2011 Bond CTC:** with CTC discount

➤ **EETC 2013 Issuance:** Composite spreads over swap rates (matched to WAL) for 2013 EETC issues calculated at issuance. Averages for B and B- include HA, UAL and AC, AMR, LCC, resp. Individual EETC issues shown as well.

➤ **ECA Equivalent to EETC based on CMV:** Implied MPR + BSB such that the total cost of financing to the airline (ECA guaranteed loan + unsecured financing for LTV and WAL difference with EETC) is equal to the EETC composite spread. LTV based on JP Morgan Master Model (April 2013) Current Market Value Appraisals.

➤ **ECA + Unsecured (CMV):** Composite spread for ECA guaranteed loan at ASU 2011 MPR + BSB and unsecured financing for the LTV and WAL difference between ECA and EETC (based on CMV)



IV. Unsecured Benchmarks: Airline CDS Spreads

	Credit Rating		20-Sept-2013 CDS bps p.a.		
Airline	S&P	Moody's	5 YR	7 YR	10 YR
Southwest	BBB-	Baa3	107	150	170
All Nippon	NR	NR	122	142	155
Lufthansa	BBB-	Ba1	148	199	233
Qantas	BBB-	Baa3	187	250	283
Emirates	NR	NR	197	227	249
British Airways	BB	B1	280	365	406
Delta	B+	B1	458	466	477
United Cont.	B	B2	489	510	497
Jetblue	B	B3	492	520	411
Air France	NR	NR	517	590	597
SAS	B-	Caa1	551	602	634

➤ CDS Source: JP Morgan / Bloomberg. CDS typical liquidity in the tens of millions (notional). Larger notional may require breaking up in several transactions and/or additional premiums to these quotes.

Airlines Benchmark Unsecured Bond Issuance in 2013

	UAL	US Airways	Emirates	Emirates	SAS
Rating Moody's/S&P	B2/B	B3/B-	NR/NR	NR/NR	Caa1/CCC+
Issue Date	2-May-13	21-May-13	31-Jan-13	13-Mar-13	19-Sep-13
Principal	\$300M	\$500M	\$750M	\$1,000M	SEK 1,500M
Maturity, Years	5	5	12	10	4
WAL, Years	5	5	7	5	4
Coupon	6.375%	6.125%	4.50%	3.875%	9.00%
Spread over Swap at Issue	5.56%	5.12%	3.00%	3.00%	6.90%