



Society of Actuaries in Ireland

**Selling Aviation Debt Securities to Insurance
Undertakings.
*A salesperson's dream or not?***

by
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Agenda

Topic		Speaker
Why invest in aviation debt securities?		JG
What types of aviation debt securities are available for investment?		
Challenges for an insurance undertaking buying aviation debt securities		JC
How does one analyse an aviation debt security?	Industry	JG
	Security	JC
Conclusion		



Why invest in aviation debt securities?

Characteristics

Aviation debt is used to finance the acquisition & operation of an income generating asset (aircraft)

Yield: 2.8% v 4.2%

Lease rental funds debt repayment

Secondary market exists for aircraft

Issuer is a Special Purpose Vehicle (SPV)
SPV does not issue other debt instruments



Types of aviation debt securities



Guaranteed by the Export Credit Agencies of Highly-Rated Sovereigns

Enhanced Equipment Trust Certificate (“EETC”)

Class A Aviation ABS Debt Securities

Class B Aviation ABS Debt Securities

Unsecured Debt

Class C Aviation ABS Debt Securities



Types of aviation debt securities

Guaranteed by the Export Credit Agencies of Highly-Rated Sovereigns

- Export Credit Agencies provide support for exports
- Form of support: Loan guarantee
- Syndicate of banks provides initial loan to an SPV
- SPV issues debt securities



Types of aviation debt securities

Enhanced Equipment Trust Certificate ("EETC")

- Trust issues debt securities
 - Owns the aircraft until debt repaid
- Aircraft leased to an airline
 - Ensure residual value of the aircraft > debt outstanding
- "Enhanced" - *Better credit rating than airline*
 - Different classes of debt
 - Liquidity support
 - Bankruptcy of the airline



Types of aviation debt securities

Classes A, B, and C Aviation ABS Debt Securities

- Secured lending to an SPV
- SPV owns a portfolio of aircraft on lease to airlines
- Service provider
- Rank in payments “waterfall”
- Few Class A have credit ratings above A (S&P)
- Liquidity support, loan-to-value ratio, and coupon

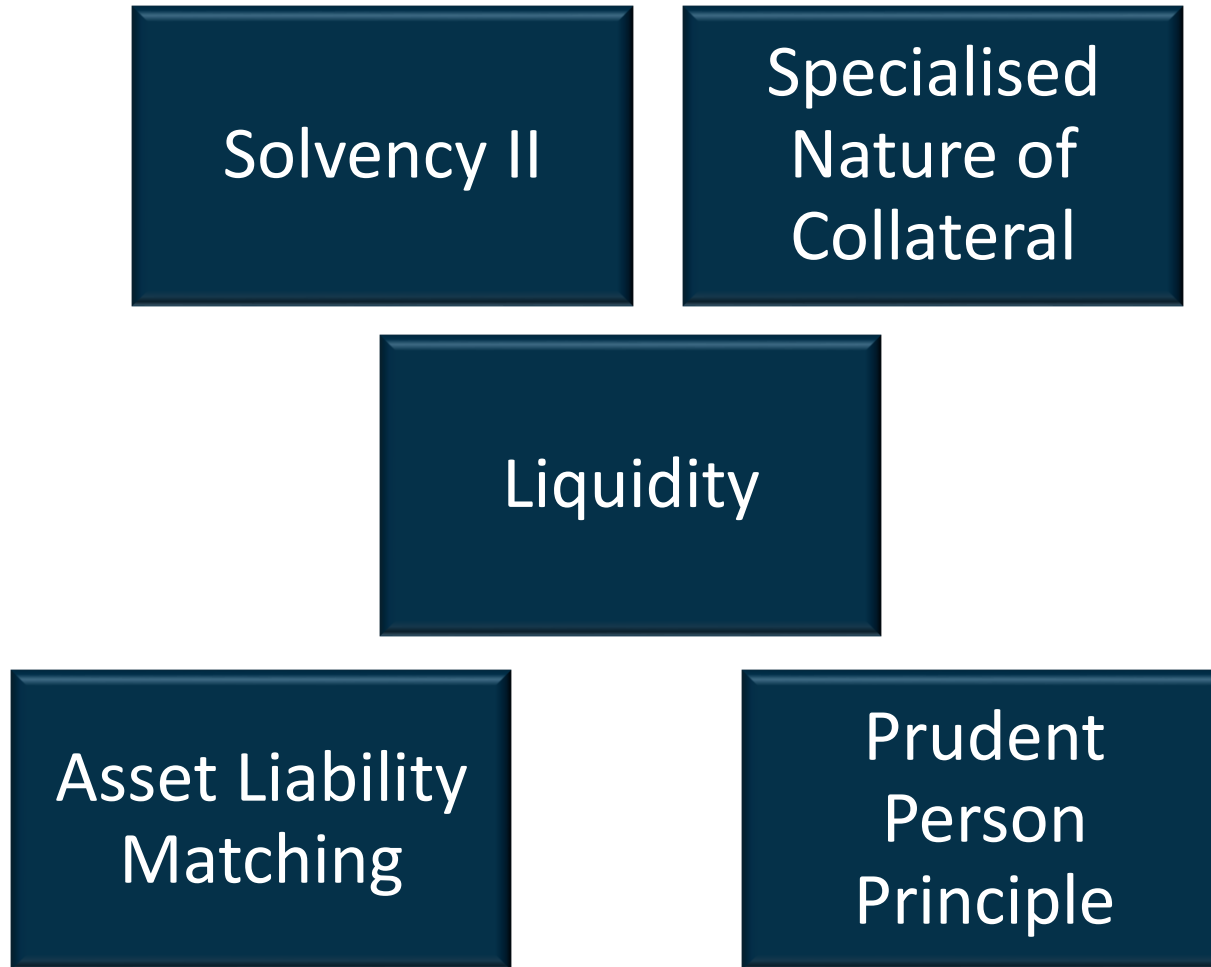


Unsecured Debt

- Airlines and aircraft lessors
- Rank with the general body of creditors in a winding up
- No SPV



Challenges for the insurance undertaking investor





Challenges for the insurance undertaking investor

Impact of Capital Requirements on Returns

5-year, zero-coupon bond

Zero-Coupon Bond	Security Price	Redemption Amount	Capital Requirement	Annualised Yield
Private Investor	81	100	0	4.3%
Insurance Undertaking	81	100	83	2.4%



Solvency II

SCR(MARKET RISK)

Sub-modules relevant to aviation debt securities:

- Spread risk: SCR(SPREAD)
- Interest rate risk: SCR(IR)
- Concentration risk: SCR(CONC)
- Currency risk: SCR(FX)



Specialised Nature of Collateral

- Detailed aviation industry knowledge required to assess collateral & dynamics of the industry
- Access to databases expensive for small investments



Challenges for the insurance undertaking investor

Liquidity

- Liquidity tends to be relatively poor
- Particularly in stressed market conditions



Asset Liability Matching

- Unit-linked funds
- Non-linked funds
- Non-life technical liabilities
- Own-funds



Prudent Person Principal

- Identify, measure, monitor, manage, control and report risks
- Liquidity
- Matching of assets and liabilities



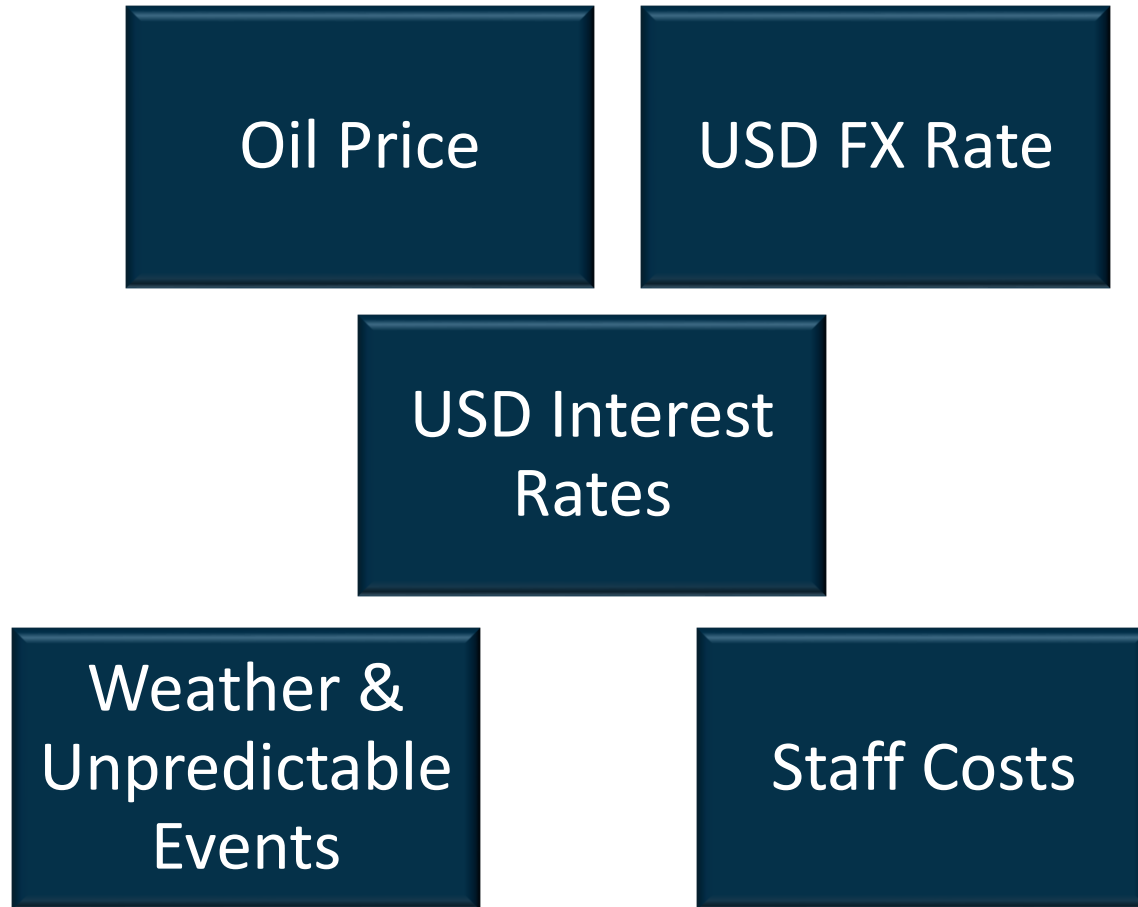
How does one analyse an aviation debt security?

Industry
Analysis

Security
Analysis



Risks Faced by Passenger Airlines





Risks Faced by Passenger Airlines

Competition

Tax &
Regulatory
Issues

World and
Regional GDP

Technology



Risks Weigh Heavily on Passenger Airlines

Credit Ratings of Passenger Airlines

Credit ratings tend to be below investment grade

United States

200 airline bankruptcies since deregulation in late 1970s

British Airways and Delta Air Lines

Airlines with an investment grade credit rating



Aircraft Lessors

Description

Lease aircraft to airlines

Debt

LTV ratio: Estimated residual value of aircraft

Revenue

Rental income | Sale of aircraft | Management fees

Expenses

Interest | Depreciation | GS&A

Variation in Net Profit

Significantly less than that of passenger airlines



Aircraft Lease Agreements

Hell-or-high-
water leases

Return
Conditions

Maintenance
Reserves



Aviation Lessors – Credit Ratings

Examples:
Ratings of BBB-
(S&P) or better:
AerCap Holdings
and SMBC

Examples: Ratings
below BBB- (S&P)

Fly Leasing Limited,
and Dubai
Aerospace
Enterprise Ltd



**Security Analysis
Castlelake Limited
CLAS 2016-1**

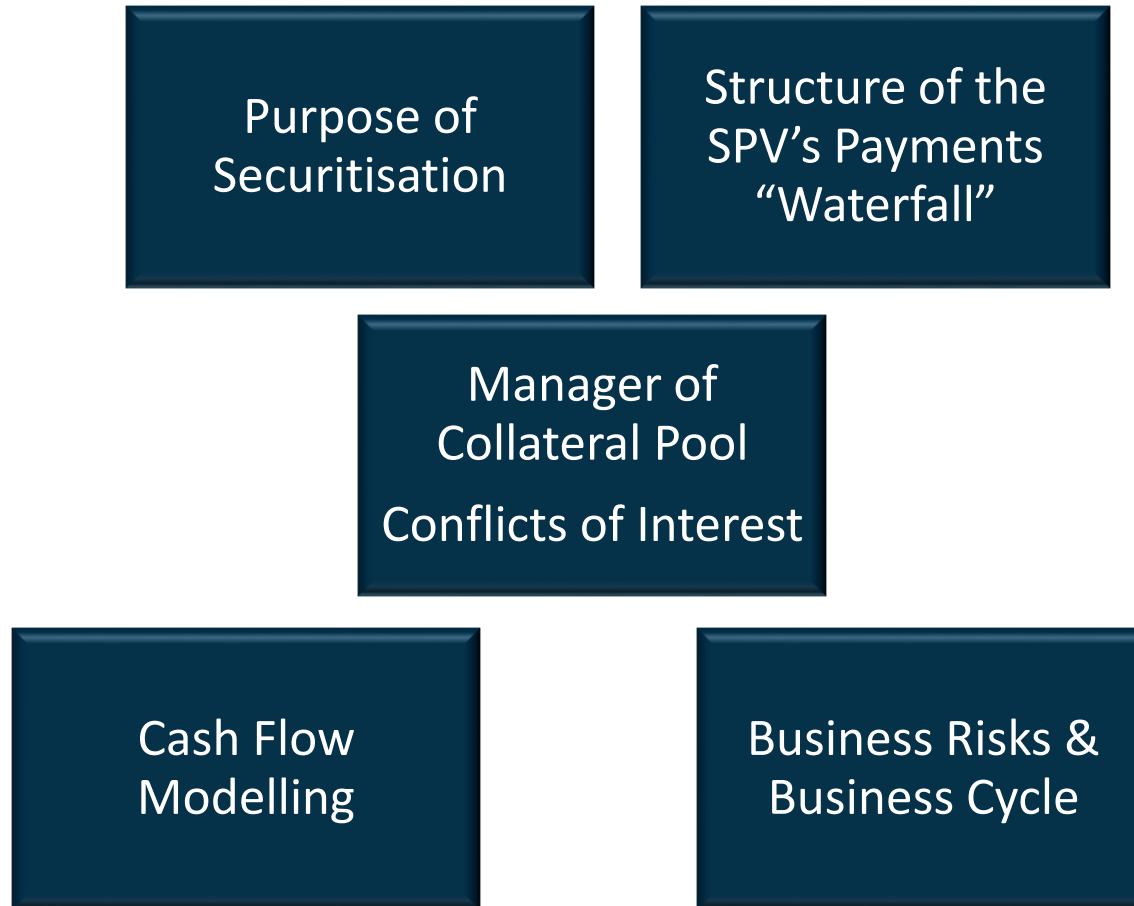


Security Analysis: CLAS 2016-1

Class	Nominal Value (USD millions)	Rating (KBRA)	Loan-to-value (per cent)	Credit Enhancement (per cent)	Coupon (per cent)
A	715	A-(sf)	64	36	4.45
B	130	BBB-(sf)	76	24	6.15
C	71	BB-(sf)	82	18	8.00



Security Analysis: CLAS 2016-1





Assumptions – Standard Formula v. Internal Model

Insurance Undertaking

- Eurozone domiciled and EU regulated life and non-life insurance and reinsurance undertakings

Legislation

- Solvency II Directive and Delegated Act published by the European Commission in October 2014

Standard Formula

- Before diversification
- Before any loss-absorbing effects



Solvency II

- Spread risk: SCR(**SPREAD**)

$$SCR_{SPREAD} = SCR_{BONDS AND LOANS} + SCR_{SECURITISATION} + SCR_{CREDIT DERIVATIVES}$$

- SCR(SECURITISATION)

- Type 1 or Type 2

- Type 1

- Residential loans
 - Commercial loans, leases and credit facilities
 - Auto loans and leases for motor vehicles or trailers, agricultural or forestry tractors, motorcycles or motor tricycles or tracked vehicles



Security Analysis: CLAS 2016-1

SCR(**SPREAD**) a function of credit quality and duration

Class	Rating (KBRA)	Credit quality step	b_i (per unit of duration) (Type 2)	Modified Duration (as at 3 September 2018)	SCR before diversification	Cost of financing SCR at 6% per annum
					Percentage of Value of Security	
A	A-(sf)	2	16.6%	2.17	36.02%	2.16%
B	BBB-(sf)	3	19.7%	2.16	42.55%	2.55%
C	BB-(sf)	4	82.0%	1.02	100%	6.00%



Conclusion

Salesperson's dream or not?

**Solvency II
Type 2
Securitisation**

Liquidity

**Specalised Nature
of Collateral**

Paper



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