
The Rating Process for Aircraft Portfolio Securitizations

The following section will discuss the four aspects involved in assigning a rating to an aircraft securitization, and will highlight how the corporate rating analysis serves as an input into the review. While in any structured finance transaction Standard & Poor's will conduct a credit analysis, cash flow and structure analysis, legal analysis, this section focuses on the rating concerns specific to aircraft financings. It is not an exhaustive treatment of general securitization issues.

Credit Analysis

The primary credit risk in an aircraft securitization is a reduction in cashflows due to a combination of airline delinquency or default (credit risk) and a reduction in the value of the aircraft (asset risk). This reduction in value could be manifested by a reduction in the collateral sale value or an inability to re-lease the plane at adequate lease rates. Such reduction, if on a temporary basis, may lead to a liquidity stress, but if permanent and for a significant amount, could lead to losses as cashflows become insufficient to repay debt in full. Applying techniques from structured finance and corporate ratings, analysts will evaluate the risk of airline defaults as well as declining aircraft and lease values. Credit support in aircraft securitizations usually takes the form of subordination, reserve funds or overcollateralization to address these risks. Support from appropriately rated parties is another option.

In analyzing credit risk, the risk of high levels of airline defaults in a given portfolio is seen to be a function of:

- The estimated credit quality of the individual airlines,
- The degree of uncertainty surrounding that credit estimate, and
- The degree of diversification.

Analysts will use actual ratings (including public information or “pi” ratings in some countries such as Japan) of airlines where possible in judging credit quality.

However, most airlines in diversified securitizations are not rated. In those cases, analysts will make an assessment of credit quality, based on its knowledge of the airline and the industry. Such assessments can have several levels of certainty, and are discounted based on uncertainty, how high the rating is, and how diversified the overall portfolio of airlines is. Thus, a rating estimate based on limited information which arrives at a high rating, and which forms part of a relatively undiversified pool, will be discounted (lowered) heavily. Conversely, a low rating, or one based on extensive information and in a well diversified portfolio, will not be discounted at all.

In assessing credit quality, analysts will consider not only the combination of airlines in the portfolio at closing, but also the potential for future adverse changes in the airline portfolio as well as the future composition of the airlines. This is due to the fact that as a lease comes to its normal expiration or an airline defaults, the aircraft may be re-leased or sold. If the aircraft is to be re-leased, the analysis must consider the potential universe of new lessees. The general view is that as a portfolio ages, the attractiveness of the ageing aircraft decreases. Airlines interested in aging aircraft tend to be of lower credit quality and located in weaker jurisdictions, thereby resulting in increased credit risk for longer term financings.

A second factor in assessing credit risk is the diversification of airlines. How many airlines in how many countries and regions are in the portfolio? Does the portfolio include flag carriers (the principal airline providing international service)? Are there charter and cargo airlines? Do these airlines operate in developed or less-developed countries? Concentration in highly rated credits is obviously a benefit. The mere fact that one portfolio may have more aircraft by number may not lead to more diversification if large portions of the portfolio are leased to the same or only a few carriers.

Another component in analyzing credit risk is an examination of the historical performance of the originator's portfolio. Analysts will look at the originator's delinquency and default experience, as well as its repossessions and recoveries. Has its portfolio shown any significant changes in terms of growth or concentration? How does the securitized pool compare to the retained pool? What does the originator believe to be the re-leasing prospects in the future?

In analyzing the future credit quality and diversification of the portfolio, Standard & Poor's will assume that concentration limits with respect to credit quality, country and regional exposures, and individual obligors will be met. By evaluating the airline credit risk, the default rates for each of the rating scenarios will be derived. The size of the portfolio, by number of aircraft and airlines, will determine the method of application for these default rates. If the portfolio is sufficiently diversified, analysts will request that stress scenarios model the default rate as a certain percentage of the portfolio by aircraft value. However, if the portfolio consists of a limited number of aircraft and airlines, it may be more appropriate to adopt a default pattern on an airline-by-airline basis.

The other component of credit risk is the asset quality, which is described above (see *Aircraft Asset Risk Evaluation in the “Aircraft Financings” section*). The outcome of the asset analysis is a value decline assumption. For a transaction that contemplates the sale of aircraft upon an airline default, this assumption is used to calculate the recovery proceeds upon an aircraft sale. For a lease deal, this analysis will be translated into a stressed lease rate upon a re-leasing event. For a transaction involving aircraft loans, the result will be a recovery assumption expressed as a percentage of aircraft collateral, which indirectly determines the recovery on the principal amount of defaulted assets.

Cash Flow Analysis

Conclusions from the evaluation of credit and asset risk form the basis of assumptions used in the cash flow modeling of stress scenarios. It is important that the cash flow and payment structure of a transaction allow for the full and timely payment of principal and interest, under worst case assumptions. The severity of these assumptions varies according to the rating sought on the bonds.

Since aircraft pool securitizations vary from transaction to transaction, a standard cash flow model is not used. Rather, analysts will review transaction-specific proprietary models prepared by the issuer, or its investment banker, that will model the stressed asset cash flows and the required payments to bondholders and other third parties. Any shortfall in revenue must be covered by a form of credit enhancement to provide the additional source of funds. The cash flow runs should demonstrate how the stressed revenue along with the credit enhancement is sufficient to meet payments under the terms of the rated securities. Depending on the terms of the rated securities, it is quite possible that final advance levels (amount of debt raised versus aircraft portfolio value) could differ significantly, even given the same set of stressed asset cash flows, airline credit quality and aircraft asset value risk characteristics. The cash flow model should demonstrate that the transaction has sufficient liquidity to pay interest and principal when due.

Analysts will develop worst-case assumptions, which will then be tested through various sensitivity analyses in order to judge the robustness of the cash flows (see *table 1 for sample runs*). The variables are as follows:

- Default timing;
- Airline default rates;
- Recovery and loss severity;
- Repossession and remarketing periods;
- Repossession and remarketing costs;
- Planes off lease (aircraft on ground); and

- Planes that cannot be repossessed during the term of the financing due to legal or other problems (lost aircraft).

Default Timing

The term of the transaction is the key determinant of how many recessions should be modeled in the cash flows. In general, one recession is assumed to occur in every eight- to ten-year period of a deal. This frequency is chosen to reflect the average term of an economic cycle in the airline industry, and to reflect the likelihood that a transaction requiring a long period to repay all debt will likely face more than one industry downturn. No attempt is made to predict the timing of an actual industry recession. Rather, these downturns are modeled so as to place greater relative stress in scenarios testing repayment of debt with higher target ratings.

The timing of defaults in the cash flow model should be tailored to the characteristics of the asset pool and the payment allocations within the transaction. It is a general rule that recessions placed at the beginning years of a cash flow model would be more severe than later recessions if the transaction incorporates a sequential pay structure whereby senior classes receive principal before subordinated tranches. However, depending on the transaction structure, payment terms, and collateral

Table 1
Typical Cash Flow Stresses for Operating Lease Deals

<i>With approximate ranges</i>				
Test	AA	A	BBB	BB
Depression 1, start (mos)	18-24	18-24	30-36	30-36
Depression 2, start (mos)	126-132	126-132	138-144	138-144
Length of depression (yrs)	3	3	3	3
Lessee defaults, depression 1 (%)	75-88	60-74	45-60	24-46
Lessee defaults, depression 2 (%)	88-93	75-79	60-65	30-51
Lessee defaults, outside depression (%)	5	5	5	5
Lease rate decline, depression 1 (%)	46-60	36-45	26-36	16-25
Lease rate decline, depression 2 (%)	68-85	54-70	42-55	30-40
Repossession/remarketing time, inside depression (mos.)	12	11	10	8
Repossession/remarketing time, outside depression (mos.)	6	6	4	2
Lease term, outside depression (yrs)	5	5	5	5
Lease term, depression 1 (yrs)	4	4	4	4
Lease term, depression 2 (yrs)	3	3	3	3
Repossession cost (\$)	500,000-750,000	500,000-750,000	500,000-750,000	500,000-750,000

pool, other timing scenarios may need to be tested. For example, a transaction that relies on the sale of aircraft, and in which a large number of aircraft are required to be sold in a relatively short period prior to the legal final maturity, may be stressed by placing a recession at the end of the transaction.

During each recession, it is assumed that a higher than normal level of losses will occur. The term of the recession may differ, typically from two to four years, and is of significance since losses will be applied over this term. By concentrating losses in a shorter or longer time frame, the credit and liquidity impact of defaults can be tested.

Depending on whether the transaction contemplates the sale of an aircraft, the release of a plane to another lessee or the foreclosure of a defaulted loan, the concept of a recovery value will need to be modeled. This recovery would be modeled following a repossession and remarketing period, during which time no income will be generated. Costs incurred during this work-out period also need to be modeled.

Airline Default Rates

As discussed above, the risk of widespread defaults depends on the credit quality of the airlines and the diversification in the portfolio. Following the evaluation of airline credit risk, analysts will assume stressed default rates for the various rating categories. Two types of defaults will be modeled: those that occur on an ongoing basis and those which would occur in a depression.

Ongoing defaults are assumed to occur throughout the deal when a recession is not being modeled. The rate of these defaults reflects the number of airlines which are expected to fall behind in their payments in a normal operating environment. This rate will be based on an examination of the originator's delinquency and default experience, taking into account the economic environment reflected in these numbers. The analysis will also factor in the probability that as the aircraft ages and becomes less desirable, airlines of lower credit quality will enter the pool via releasing.

In addition to the ongoing defaults, there will be significantly higher default levels associated with the depression scenarios. Defaults for 'AA' cash flows may range from approximately 75% to 90% of the portfolio value being in repossession during each of the depressions. For 'BB' stresses, the levels would be lower, for example in the 25%-50% range. As mentioned earlier, default rates used in the second depression would tend to be at the higher end of the range due to the additional risks associated with an aging portfolio and uncertainty as to the identity of the airlines.

Various methods should be used to model these default rates in the cash flows : default all requisite airlines up front; default airlines towards the end; default randomly; and combinations of the above. The cash flows should be robust enough to withstand varying patterns of default such that a temporary spike or sustained level of losses, consistent with the rating level, would not result in an interruption in payments to noteholders.

Recovery and Loss Severity Assumptions

As mentioned earlier, the result of the aircraft asset analysis is a series of recovery assumptions for each rating level. For a sale or operating lease deal, provided that the legal analysis demonstrates adequate access to the aircraft collateral, it is assumed that the aircraft can be sold or re-leased following an airline default or the expiration of a lease. An aircraft that is returned to the portfolio in the midst of a recession would obviously have a lower value than one which is sold or re-leased in a more normal operating environment. Similarly, if the issuer has to foreclose on a defaulted loan, the recovery proceeds will depend on the security structure. Standard & Poor's assumes that all defaults which occur within a recession would be subject to stressed recovery rates. Depending on the time required to foreclose, such recovery proceeds may only appear in the cash flows following the expiration of the recession period itself.

Where two recessions are modeled in the cash flows, loss severity assumptions are more severe for the later recessions. These higher decline assumptions reflect the reduced attractiveness of an aging fleet and the increasing risk of new technologies being introduced.

Repossession and Remarketing Period

The repossession period is the time it takes to repossess an aircraft if the defaulting lessee has not agreed to a voluntary repossession. Obviously, an aircraft is only valuable to the owner if it has the right to repossession. Analysts will request a jurisdictional survey for each jurisdiction where an aircraft in the portfolio is expected to be registered, domiciled, or principally used. Where the portfolio is of a sufficient size, at closing it may be possible to provide surveys for currently relevant jurisdictions and a selection of other jurisdictions which are likely to be relevant in the future. The purpose of this questionnaire is to determine whether the issuer has sufficient legal rights to repossess, sell, re-register and export for its own benefit the aircraft leased to a defaulting carrier.

In conducting this analysis, issuer's counsel would need to take into account the domicile of the airline, jurisdiction of registration of the aircraft, and operating jurisdictions. Once the legal right to repossess the aircraft has been demonstrated, the time for repossession must be determined. Analysts will review any special legal or regulatory provisions which may increase or decrease repossession time and the lessor's own track record and will analyze any industry and market information available.

The remarketing period is the time necessary to find a new lessee once the aircraft has been returned to the lessor. If a lease has reached its scheduled expiration date, this period will be shorter than if the aircraft had been returned from a defaulting lessee. A lessor will have advance warning of scheduled lease maturities and normally

would arrange to lease or obtain commitments for aircraft coming off-lease many months in advance of the lease maturity date.

The best option to minimize remarketing time would be to re-lease to the same carrier. Within a depression, it is assumed that the remarketing period will be longer because the balance between the supply and demand for leased aircraft or aircraft sales may be affected. In a depression, more planes become available for re-leasing due to the large number of lessee defaults and the increased likelihood that credit-impaired lessees will have a lack of capital or liquidity to lease aircraft.

During the combined repossession and remarketing period, it is assumed that the aircraft affected would generate no income. In “AA” rating scenarios, the combined down time during a recession may be about 12 months; for “BB” stresses, 8 months would be a typical period.

Repossession and Remarketing Costs

If a lessor decides to repossess an aircraft, it will incur costs for a variety of reasons: legal work, insurance, pilot expenses, fuel, storage, documents for de-registration, and export of aircraft. In the cash flow simulations, repossession and remarketing costs per plane may range from \$500,000 to \$750,000 per event. The lessor’s historical experience is a factor in determining the final amounts. In addition, the number of planes in the portfolio is considered—for large portfolios, it may be possible to assume an average cost. Costs may differ depending on whether the portfolio consists of commercial jets or the regional variety.

Aircraft on Ground

The cash flow impact of a certain percentage of aircraft on ground (AOG) also needs to be modeled. It is assumed that no lessor would be in a position where 100% of its fleet would be generating revenue. Aircraft may be leased to delinquent lessees who have defaulted on a temporary basis or are in the process of working out a payment plan with the lessor; they may be in a repossession and remarketing scenario; they may be in the midst of being reconfigured for a new lessee; or there may be delays in the start of the lease, etc. Data on the originator’s historical AOG levels will be examined and a level chosen for each rating scenario.

Lost Aircraft

Occasionally, there may be circumstances in which no residual value should be attributed to an aircraft which has been securitized. It is not always possible to predict with certainty the location of an aircraft at the time of the intended repossession. Unless the aircraft happens to be in a jurisdiction for which a jurisdictional questionnaire has been answered, analysts will not always know what procedures the issuer must follow in order to retrieve the aircraft from its lessee and the time such a procedure

would take. It is possible that the aircraft repossession proceedings may still be continuing at a time when payments are due to noteholders. If this is the case and it is likely that access to the collateral or sale proceeds will be withheld or delayed, then a zero recovery value would be applied to that aircraft.

This stress is more applicable to smaller portfolios where the loss of one aircraft would have a more significant impact on the cashflows. In a large portfolio, diversity in the number of jurisdictions could mitigate this risk.

Legal Considerations

The simplest form of aircraft portfolio securitization involves the issuance of debt securities to fund the acquisition of aircraft from the current owner, which ordinarily is an aircraft leasing company or aircraft manufacturer. The seller of the aircraft, either directly or indirectly through subsidiaries, will have leased the aircraft to a variety of airlines in various jurisdictions, and the aircraft are conveyed subject to the existing leases. The issuer, either directly or indirectly through one or more wholly-owned subsidiaries, becomes the lessor.

The issuer contracts with a leasing company to service its portfolio of aircraft. As discussed in the section “The Servicer’s Role and Responsibilities”, these services usually include collecting lease rents, remarketing, re-leasing and repossessing aircraft, and other functions related to portfolio management. The issuer also contracts with other parties to provide necessary financial, administrative, and corporate services and may enter into financial agreements, such as swaps and liquidity facilities.

As security for the repayment of the notes, the issuer grants mortgages, charges, or assignments over its ownership interests in the aircraft, its interests in the leases and any subleases, its rights under the servicing, administration and other agreements, and its other property (including, for example, accounts, deposits, and reserves). As discussed above, the rated securities typically are tranching by subordination resulting in different ratings for each series. These series reflect the different likelihood of repayment from the stressed cash flows.

In this simple form of securitization, the principal legal issues include:

- The bankruptcy-remoteness of the issuer and other parties whose bankruptcy will not be assumed in the review,
- The true sale of the aircraft assets and any other rights or assets to the issuer, and
- The effectiveness of the security arrangements and creditors’ rights.

Other legal issues arise in the analysis of the underlying leasing transactions, the issuer’s financial and other agreements, the tax status of various parties and payments, and issues specific to the legal status of the parties to the transactions and laws of the jurisdictions relevant to the parties and the assets.

Most securitization structures are not as simple as the example presented above. In practice, complex legal and analytical issues that are specific to a proposal are the rule rather than the exception. The following discussion of principal legal issues, together with other relevant Standard & Poor's publications, is intended to provide a foundation for identifying issues that often require more subtle legal and analytical judgments, and revised requirements, than is reflected below.

Bankruptcy-Remote Entities

Standard & Poor's bankruptcy-remoteness criteria depend on the form of the entity, but common requirements for any form are set out above under "Legal Considerations for Airline Equipment Debt." For certain ownership structures, analysts may conclude that the ultimate owners of a corporate issuer would have little incentive to commence a bankruptcy proceeding against the issuer or its affiliates in the aircraft ownership or leasing chain. An example of this ownership structure would be a company organized in the Cayman Islands whose entire equity interests are held pursuant to a declaration of trust for the benefit of charitable interests and which otherwise is in compliance with all other criteria. As discussed in the section referred to earlier in this paragraph, many trust structures raise concerns about risks that need to be particularly addressed in legal opinions. In addition, corporate structures frequently include interests that raise such risks.

In addition to the issuer's owners, the originator typically has a continuing role in the securitization structure that raises concerns about the effect of its insolvency on the issuer's status that must be addressed in one or more opinions bearing on these risks. The legal analysis will focus principally on the following risks:

- That the assets and liabilities of the issuer and its affiliates may be combined with the originator's estate in bankruptcy under the doctrine of substantive consolidation, a theory of agency, or another similar principle;
- That the continuing role of the originator may be inconsistent with accepting a true sale conclusion with respect to the conveyance of the assets by the originator; and
- That the conveyed assets may be so vital to the reorganization of the originator in its bankruptcy that it would have a very great incentive to commence bankruptcy proceedings against the issuer, or to cause such a proceeding to be commenced.

These concerns are not easily addressed by legal opinions alone and require Standard & Poor's to assess the relevant features of the securitization structure from both an analytical and a legal perspective.

True Sale

The true sale review of the conveyances of assets into the issuer has two prongs. First, the conveyance must validly and effectively convey the asset, and ownership must be perfected in the issuer under all applicable laws, including any regulatory requirements. Second, the conveyance must be irrevocable and not subject to avoidance even in the seller's insolvency.

For entities subject to the U.S. Bankruptcy Code, this conclusion will be expressed in a legal opinion to the effect that, in the transferor's insolvency, the assets would not be viewed as property of the estate of the transferor under Section 541 or be subject to the automatic stay under Section 362(a) of the U.S. Bankruptcy Code. For certain assets, Standard & Poor's also may require a legal opinion to the effect that the transferred assets and the related debt service payments to the note-holders would not be recoverable as a preference under Section 547(b) of the U.S. Bankruptcy Code or be deemed a fraudulent conveyance under state or federal law. Equivalent opinions will be required in relevant non-U.S. jurisdictions.

If the aircraft manufacturer is the originator, it frequently will have provided some form of seller financing or support in the underlying lease transactions being conveyed into the securitization structure or will have, directly or indirectly, a continuing role or obligations in the securitization. Standard & Poor's requires true sale opinions in these securitizations even for assets conveyed, directly or indirectly, by the aircraft manufacturer.

Security Interests and Creditors' Rights

A first priority perfected security interest in the aircraft assets and the other property and rights of the issuer principally serves two purposes. First, it provides a direct route for the security trustee to dispossess any other interests and proceed to realize on the collateral on a timely basis in the event of a default. Second, it provides a significant disincentive for any unsecured creditor, any creditor with a lower priority interest, or the holder of any equity or beneficial interest to commence bankruptcy proceedings against the issuer, or to cause such proceeding to be commenced.

In this simple form of securitization, legal opinions are required confirming that the noteholders have the benefit of a first priority security interest (or its non-U.S. equivalent) over the aircraft assets and other property and rights of the issuer. Where non-U.S. law governs the creation, perfection, and priority of the security and where the issuer (or another grantor) is not a U.S. entity, transaction counsel should provide its analysis of the applicable laws and proposed opinions for Standard & Poor's to review early in the rating process.

As discussed above under "Legal Considerations for EETCs", Standard & Poor's considers that the effectiveness of subordination provisions under applicable law,

even in the issuer's bankruptcy, greatly diminishes the incentive for any parties bound by such terms to commence bankruptcy proceedings against an issuer. Legal opinions confirming such effectiveness are required for non-U.S. entities generally as a part of Standard & Poor's review of the tranching debt and the bankruptcy-remoteness of the issuer.

Operations Review

The review performed on the portfolio should be at least equal to the market standard if the portfolio of aircraft assets were sold to a third party. An operations or corporate review consists of reviewing both qualitative and quantitative factors.

Qualitative factors will focus on ascertaining the position of the originator within the industry and the overall risk assessment of that industry. Analysts will conduct an extensive review of the originator and servicer's operations. Any change in the way the company undertakes its business could have an impact on the performance of the portfolio. As will be mentioned in the servicer section, the role of this entity is unique in a portfolio securitization and the analytical process will include an onsite visit. Any other parties to the transaction who are deemed to play a crucial role to the securitization, for example the hedging manager, will also be reviewed. In addition to the onsite visit, analysts will examine operating manuals, internal information systems, and any other documentation created for the purposes of the securitization.

Quantitative factors will focus on additional factors that could affect the final credit enhancement levels, cash flows, and legal structure. These factors can include such things as an audit of the portfolio data, a review of the individual leases, and an examination of all relevant jurisdictional reviews.

It should be noted that analytical process relies on the originator, its accountants, counsel, and other experts for the accuracy and completeness of the information submitted in connection with the ratings. Standard & Poor's retains the right to require additional information that it feels necessary to conduct and maintain the rating on a particular transaction.