

Risk assessment for project finance backed securities

12 March 2007



Since the 1970s and 1980s commercial project finance has been one of the primary sources for the funding of major power, oil, gas and infrastructure projects. The sharp increase in infrastructure requirements that many countries have experienced over the last decade coupled with the interest in funding public assets with private capital, has led to a funding gap. New sources of capital have been sought.

Although historically occasional securities have been issued backed by specific project finance assets, the requirement for capital has led to a newfound interest in securitization of pools of project finance assets.

According to Dr Peter Andrésén, senior manager at Risk Integrated, this interest has been driven by the desire of long-term investors such as insurance companies to diversify away from their traditional investments in real estate and

by banks that have used securitization, either synthetic or true-sale, as a way to manage their regulatory capital requirements.

These new asset backed securities (ABS) are typically based on a group of deals owned by an institution who then wants to refinance them. This is especially the case for banks that do not expect to comply with Basel II at the advanced level for project finance and will be required to hold significant capital against any assets on their books.

For project finance-backed ABS, the investors are typically looking at a group of a dozen PF deals and, to date, the underlying projects have been of a similar nature (e.g., all power or tollroads). This uniformity eases the assessment of the assets, but makes for a less diversified portfolio. Securities backed by mixed assets are likely to be developed, but only when the diversification benefits can be demonstrated.

Quantifying risk in ABS

The quantitative assessment of PF deals is typically very difficult for several reasons. First of all, assessing the risk of individual deals is complex. Project finance deals typically have legal structures with conditional income payments, uncertain costs, conditional loan amortization patterns and multiple currencies, reserves, hedges and guarantees. New deal structures are always evolving so there is little applicable historical default data to guide the risk assessment of the latest deal structures.

The normal way of assessing these risks is to build a cashflow model for the deal and apply stylized stresses on the input factors. This gives a feel for the sensitivity of the deal, but does not assess probabilities.

With the introduction of the Basel II capital regulations, to minimize capital requirements it has become important to have the ability to assess and tailor the probability of default and loss given default for a given deal. The most detailed way to assess the effect of deal structure on risk is using cashflow simulation. It tests the cashflows under thousands of possible macroeconomic and market conditions, including the possible default of counterparties. The conditions are selected through a careful, random process to reflect the volatilities and correlations for all factors involved. Simulation gives detailed year-by-year statistics for default, loss and profit and is one of the principle ways of quantifying risks in project finance transactions.

The difficulty of risk assessment in the case of asset backed securities is further complicated by the need to:

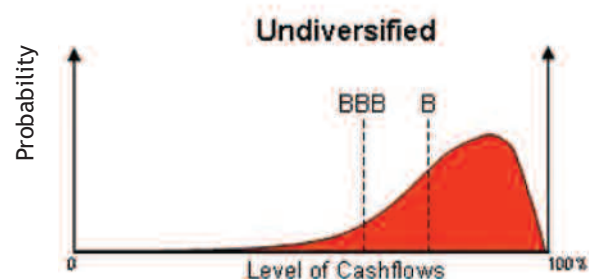
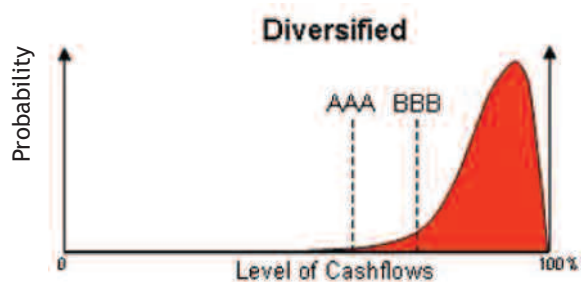
- Have a common basis for assessing all deals
- Assess the correlation and diversification between deals

Typical practice is that each deal has its own unique model but such an approach does not provide the common framework within which to evaluate all the deals, so it is necessary to create a model able to take the superset of the whole range of deals.

Creating a single model that can act as a unified basis and cater to all deal types is difficult and verges on rocket science, but can be done. With a single model, the techniques of stress testing and simulation can be applied to provide a unified picture of the individual risks that each asset in the portfolio faces.

Understanding the correlation and diversification between the assets in the portfolio is crucial because it can make a significant difference in the tranching and cost of funding.

Consider the illustrations below.



Each shows the distribution of possible cashflows from the underlying assets. The top graph shows the distribution from a well diversified set of assets in which it is unlikely that many of the assets will fail simultaneously. The maximum probable loss is low and a large portion of the portfolio's value can be funded at a AAA rate.

In the bottom graph, there is less diversification and it is quite likely that many assets will fail simultaneously, meaning that the same level of funding can only be given a BBB rating. Note also that in both graphs, the less junior tranches have a significantly worse loss-given-default.

An issuer who is selling these assets and can quantify and demonstrate these diversification effects can use them to guide the composition of the portfolio and give potential investors more confidence in the risks they are undertaking, to reduce the funding cost. Beyond selecting diversified assets, the structurer can also make the overall cashflows more stable by tailoring the reserves and adding appropriate hedging.

A simple example would be to buy caps and add them to the security if it is found that deal defaults are correlated with rises in interest rates. This creates a security backed by assets that in aggregate, diversify each other, resulting in stable cashflows.

Conclusion

The increased popularity of project finance backed securities and the inherent complexity of such assets has highlighted the need for advanced methodologies to assess and structure the risk.

For individual project finance deals, cashflow simulation models provide the most detailed description of the probability of default and loss given default inherent to the deal and allow for detailed structuring of covenants, amortization profiles and reserves within the deal.

Similarly, at the portfolio level, a framework of coherent cashflow simulation models can guide the efficient selection of assets and optimization of the ABS structure.

By using such a unified framework, the correlation and diversification of the portfolio can be assessed directly. This provides issuers with the ability to structure the composition of the security, hence providing the opportunity for reduced funding costs. ■