The essence of structured finance is that it takes pools of undifferentiated risks—such as those contained in a portfolio of residential mortgages or credit card debts—and parcels them out into debt instruments with different risk profiles. The efficiency in this process is that it allows different investors with different interests and risk appetites to purchase exactly the risks they want. By matching available risk and investor appetite, the structured finance market provides better and cheaper pricing to the financial markets as a whole by the simple device of allowing a greater symmetry between buyers (of risk) and sellers (of risk). In due course, one expects that the operations of the market will result in this cheaper pricing flowing to the ultimate consumers of debt, whether in the retail sector (mortgages, credit cards, car loans, etc.) or the wholesale sector (corporate lending, project finance, etc.). Since selling the original pool of undifferentiated risk may be difficult in some markets where there are no buyers for such risk, securitization also allows potential sellers of risk (usually banks) to find buyers for their assets. This allows banks to manage their risk more efficiently, thus increasing the stability of the financial markets as a whole.

For a securitization market to develop, investors must be able to compare the risks of the various tranches being offered in the market. As we have seen, securitization works by providing buyers of risk with the risk they seek. By providing an objective and independent assessment and a universal scoring system that allows for like comparisons of credit risk, rating agencies assist in this process.

**Market participants and their roles**

A number of different participants are involved in structured finance markets (Figure 2). These include: the arranger, who sets up the structure, tranches the liabilities and markets the tranches; one or more originators, who either originate the underlying assets in the course of their regular business activities or source them in the open market; the servicer, who collects payments and may track pool performance; the asset manager, who - in managed transactions - may assemble the initial pool and subsequently trades in and out of collateral assets; the trustee, who oversees cash distributions to investors and monitors compliance with deal documentation; and, in certain deals, financial guarantors (e.g. the so-called monolines), who provide guarantees on principal and interest payments to, or sell credit default swaps on, particular tranches as part of their business model of underwriting high-grade credit risk.
When structured finance instruments are made up of non-traded loans or similar claims, the originators tend to be banks or finance companies. When the collateral pool is made up of traded assets, the arranger is typically also the originator and is often an investment bank or the asset management arm of a financial conglomerate. The servicer, whose role is particularly important for instruments based on large, traditional ABS pools, is often the originating bank or a specialized institution. Asset managers are typically dedicated units within banks and other financial institutions or standalone asset management firms with prior experience managing fixed income assets. The role of trustee is usually assumed either by specialist legal firms or units within major financial institutions. Investors differ across products and with regard to the seniority level of the tranches they invest in. Initially, demand for structured finance products was dominated by banks and dedicated ABS investors seeking exposure to new sectors, regions, or asset classes. Subsequently, insurance companies entered the market, initially at the more senior level. Later, owing in part to tightening spreads, they started to invest also at the mezzanine level of the larger, more granular asset pools and, to a lesser extent, CDOs.

Complexity of structured finance instruments
Pooling and tranching, while being key sources of value in structured finance, are also the main factors behind what might be called the “complexity” of these instruments. As far as pooling is concerned, evaluation of risk and return of a structured finance security necessitates modeling the loss distribution of the underlying asset pool, which may be complicated when the pool consists of a small number of heterogeneous assets. However, as tranching adds an extra layer of analytical complexity, the evaluation of a structured finance instrument (in other words, a tranche) cannot be confined to analyzing asset pool loss. It is also necessary to model the distribution of cash flows from the asset pool to the tranches; that is, to evaluate the deal’s specific structural features. These features, defined via covenants, may entail sets of rules for the allocation of principal and interest payments received from the collateral pool and for the redirection of these cash flows in the case of stress situations, in addition to specifying the rights and duties of various third parties involved in the transaction.

Risk of structured finance instruments
Consequently, structured finance instruments give rise to “non-default” risks – i.e. risks that are unrelated to defaults in the collateral pool, but which nevertheless affect the credit risk of issued tranches. One source of non-default risk is the conflicts of interest among tranche holders. For example, senior note holders are promised interest during the life of the transaction and a principal payment at maturity. Equity holders have no promised principal payment; therefore, they have an interest in seeking high up-front payouts before defaults begin to deplete their tranche holdings. By implication, to the extent that equity investors can influence initial portfolio selection, they may be willing to sacrifice credit quality in exchange for enhanced yield payments, e.g. by including credits with wide spreads for given rating levels.

Structured finance ratings
From the beginning, structured finance has largely been a “rated” market. Issuers of structured instruments apparently wanted them to be rated according to scales that were identical to those for bonds, so that investors, some of whom were bound by the ratings-based constraints defined by their investment mandates, would be able and willing to purchase the new products. According to the major rating agencies (i.e. Fitch, Moody’s and Standard & Poor’s), all products they are asked to rate are subject to a common rating process. Rating decisions are made by a credit committee on the basis of an assessment of instrument-specific documentation and other information provided by analysts. The committee’s opinions may then be fed back into the rating process, for example through revision of standard assumptions. In addition, all ratings are ultimately mapped into an alphanumerical scale benchmarked to the historical performance of corporate bonds.
Until recently, the agencies focused the majority of their business on single-name corporate finance—
that is, issues of creditworthiness of financial instruments that can be clearly ascribed to a single
company. In recent years, the business model of credit rating agencies has expanded beyond their
historical role to include the nascent field of structured finance. As a result, structured finance ratings
are now among the largest and fastest growing business segments for the three leading credit rating
agencies and have developed into an important revenue source.

A structured finance rating is an opinion regarding the likelihood that the cash flows from the
underlying pool of assets will be sufficient to service the claims associated with a particular tranche. In
common with other securitizations, structured finance ratings assess the sustainability of projected
cash flows from a finite-lived reference portfolio, while traditional credit ratings assess the likelihood
that the obligor’s ongoing business activities will generate the cash flows required for debt service and
repayment. This finite-lived nature of the transaction makes structured finance ratings more
comparable to project and leveraged finance than to corporate or sovereign bond ratings.

Structured finance and bond ratings differ not only in the conceptual dimensions, but also in terms of
performance. Given their pooled nature, which mitigates exposure to idiosyncratic risk through
diversification, structured finance products might be expected - and indeed do – exhibit greater
ratings stability on average. Fitch, for example, studies the performance of structured finance ratings by
tracking the migration of rated tranches over the 1991-2001 periods. Overall, ratings, particularly those
in the investment grade segment, are found to be very stable, with 98% of the investment grade
tranches maintaining their rating or being upgraded. Similarly, according to Moody’s, structured
finance ratings have changed much less frequently than have corporate ratings, even though the
average number of notches changed per rating action has been higher for structured finance. Therefore,
the likelihood of a rating change is smaller in structured finance, while the magnitude of the change is
larger.

Causes of Rating Volatility
Historical data for a variety of asset classes clearly shows that structured finance ratings, including
those on CDOs, have actually exhibited lower downgrade rates than their corporate cousins. At the
same time, there is no doubt that certain kinds of structured finance debt are more prone to ratings
volatility than others. The reasons for these effects lie primarily in three concepts:

- Degrees of freedom,
- Granularity
- Leverage

Degrees of freedom
Events that can alter the default risk of corporate debt come in two forms. First are external events
affecting the issuer. These include macroeconomic events, such as recessions or shifts in foreign
exchange rates and interest rates, as well as industry-specific events, such as new competitors entering
the market, advent of new technologies, etc. Second, there are internal events relating to the way the
issuer manages itself and its business. Obviously, the two types of event are usually interrelated, as
companies respond to external changes with internal ones.

It is also important to note that some structured finance asset classes feature greater discretionary input
from a third party. For example, in cash (and increasingly synthetic) CDOs a degree of discretion is
granted to the CDO manager. This is done in the belief that the CDO manager will use this discretion
to dampen any volatility by substituting volatile collateral with more stable collateral. We recognize,
as does the market, that depending on how individual managers exercise this discretion, such CDOs
may be more volatile or less volatile than CDOs with no management, although to date the evidence
suggests that managers have successfully managed for greater rating stability.
Granularity
Another cause of potential differences in volatility is what we will refer to as granularity. Some asset classes in structured finance typically securitize large numbers of smaller debts (e.g., RMBS), whereas others securitize smaller numbers of larger debts (e.g., European CMBS). The former therefore have more granular pools than the latter.

The impact of granularity on long-term rating volatility is complex. However, when a rating action is taken, transactions with less granular pools generally show greater potential for larger movements in the rating. For example, considering a typical European CMBS transaction backed by only five loans, it is quite possible that on a certain date, say, two of the loans (i.e., 40% of the pool) are repaid. As a result, both the asset pool and the liability structure of the transaction can change radically overnight, potentially having a significant effect—in this case often positive—on the CMBS ratings. Compare this with an RMBS transaction backed by 5,000 loans: here it would be far less likely to see 40% of the pool (2,000 loans) repaying over such a short space of time.

Leverage
A further often cited influence on volatility is leverage. The term is used in a number of ways throughout the structured finance world. Most commonly, it is used in the CDO asset class to describe the sensitivity of spreads, market value, or likely return on a security to equivalent changes in the underlying portfolio. A security's leverage in this sense depends partly on its position in the capital structure and its "thickness" relative to the underlying portfolio.

Rating methodology
As has been noted above, key to the reliability of structured finance ratings is the agencies’ accuracy in assessing the credit risk in the underlying asset pool, as well as the accurate modeling of the distribution of cash flows from the asset pool to different groups of note holders. All three major rating agencies follow a two-step rating approach, which applies equally to CDOs and traditional ABSs:

- credit risk modeling (focuses on the asset pool)
- structural analysis (focuses on the distribution of cash flows)

First, analytical models are used to assess pool credit risk. The tools applied for analyzing CDO and ABS pools will differ, and differences will also appear across rating agencies. The second step is a structural analysis, which will crucially depend on deal specifics, as laid out in the transaction's documentation. This step involves detailed cash flow modeling, based on the results of the credit risk analysis as well as legal assessments and evaluations of any third parties involved in the deal. The results of the cash flow analyses, in turn, may feed back into the credit model in the form of stresses applied to particular model assumptions. Finally, all of the information is aggregated and mapped into a single, alphanumeric tranche rating.

The main factors driving the loss distribution of any portfolio and, hence, the three main inputs into each agency’s methodology are estimates of:

1. Probabilities of default (PDs) of the individual obligors in the pool and how these vary over the life of the transaction
2. Recovery rates (or losses-given-default (LGD), i.e. measures of recovery risk)
3. Default correlations within the pool, which determine the tendency of multiple defaults to occur within a given period of time.

Traditional ABS portfolios are usually made up of large, well-diversified, homogeneous pools of assets (e.g. residential mortgages or credit card receivables), with no significant individual exposures relative to overall pool size. Thus, idiosyncratic risk is much less important for ABSs than for instruments with less diversified and more heterogeneous collateral pools. This implies that the default
characteristics of an ABS pool can be estimated via the law of large numbers, and the underlying assets can be assumed to give rise to stable, predictable loss distributions.

CDOs, on the other hand, are “lumpy” (i.e. less granular than traditional ABSs) and generally contain, or are referenced to, relatively small numbers of non-homogeneous assets. As a result, both idiosyncratic and systematic risks are important. Methods used for calculating loss distributions for traditional ABS portfolios are thus inappropriate for CDOs.

The Challenge of Rating Structured Finance Instrument
Credit ratings are designed to measure the ability of issuers or entities to meet their future financial commitments, such as principal or interest payments. Depending on the agency issuing the rating and the type of entity whose creditworthiness is being assessed, the rating is either based on the anticipated likelihood of observing a default, or on the basis of the expected economic loss – the product of the likelihood of observing a default and the severity of the loss conditional on default. As such, a credit rating can intuitively be thought of as a measure of a security’s expected cash flow. In the context of corporate bonds, securities rated BBB- or higher have come to be known as investment grade and are thought to represent low to moderate levels of default risk, while those rated BB+ and below are referred to as speculative grade and are already in default or closer to it.

Fitch’s assumptions regarding the 10-year default probabilities of corporate bonds as a function of their rating at issuance and the corresponding annualized default rates are given below. These estimates are derived from a study of historical data and are used in Fitch’s model for rating collateralized debt obligations (Derivative Fitch, 2006). It is noteworthy that within the investment grade range, there are ten distinct rating categories (from AAA to BBB-) even though the annualized default rate only varies between 0.02 and 0.75 percent. Given the narrow range of the historical default rates, distinguishing between the ratings assigned to investment grade securities requires a striking degree of precision in estimating a security’s default likelihood. By contrast, the ten rating categories within the speculative grade range (from BB+ to C) have default rates ranging from 1.07 to 29.96 percent.

### Historical Default Experience of Bonds Rated by Fitch

#### Investment-grade Bonds

<table>
<thead>
<tr>
<th>Rating</th>
<th>AAA</th>
<th>AA+</th>
<th>AA</th>
<th>AA-</th>
<th>A+</th>
<th>A</th>
<th>A-</th>
<th>BBB+</th>
<th>BBB</th>
<th>BBB-</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-yr Default Prob.</td>
<td>0.19%</td>
<td>0.57%</td>
<td>0.89%</td>
<td>1.15%</td>
<td>1.65%</td>
<td>1.85%</td>
<td>2.44%</td>
<td>3.13%</td>
<td>3.74%</td>
<td>7.26%</td>
</tr>
<tr>
<td>Default Rate (ann.)</td>
<td>0.02%</td>
<td>0.06%</td>
<td>0.09%</td>
<td>0.12%</td>
<td>0.17%</td>
<td>0.19%</td>
<td>0.25%</td>
<td>0.32%</td>
<td>0.38%</td>
<td>0.75%</td>
</tr>
</tbody>
</table>

#### Speculative-grade Bonds

<table>
<thead>
<tr>
<th>Rating</th>
<th>BB+</th>
<th>BB</th>
<th>BB-</th>
<th>B+</th>
<th>B</th>
<th>B-</th>
<th>CCC+</th>
<th>CCC</th>
<th>CC</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-yr Default Prob.</td>
<td>10.18%</td>
<td>13.53%</td>
<td>18.46%</td>
<td>22.84%</td>
<td>27.67%</td>
<td>34.98%</td>
<td>43.36%</td>
<td>48.52%</td>
<td>77.00%</td>
<td>95.00%</td>
</tr>
<tr>
<td>Default Rate (ann.)</td>
<td>1.07%</td>
<td>1.45%</td>
<td>2.04%</td>
<td>2.59%</td>
<td>3.24%</td>
<td>4.30%</td>
<td>5.68%</td>
<td>6.64%</td>
<td>14.70%</td>
<td>29.96%</td>
</tr>
</tbody>
</table>

In the single-name rating business, where the credit rating agencies had developed their expertise, securities were assessed independent of one another, allowing rating agencies to remain agnostic about the extent to which defaults might be correlated. But, to assign ratings to structured finance securities, the rating agencies were forced to address the bigger challenge of characterizing the entire joint distribution of payoffs for the underlying collateral pool. As the previous section demonstrated, the riskiness of collateralized debt obligation tranches is sensitive to the extent of commonality in default among the underlying assets, since CDOs rely on the power of diversification to achieve credit enhancement.
Possible issues arising for structured finance markets

Model risk in agency ratings:

Generally defined, “model risk” relates to potential errors made in evaluating and pricing the exposures arising from financial transactions. Model risk is, therefore, not confined to structured finance. However, given the lack of historical default data and the analytical challenges in assessing credit risk exposures (e.g. treatment of correlation, recoveries and time variation), it is likely to be a more important issue in the credit risk than in the market risk world. As investors rely on ratings for their structured finance investments, the model risk linked to the agencies’ rating methodologies will be among the principal risks these investors are exposed to.

In the context of rating structured finance instruments, model risk has two principal components. The first is related to the quantitative models (and assumptions) the rating agencies use to estimate portfolio credit risk, e.g. potential errors related to assumed correlation values. The second is related to deal-specific, structural model risk, which is in turn related to the arranger’s proprietary structuring techniques and other determinants of “deal structure”, e.g. covenants governing the redistribution of cash flows. Given the involvement of third parties, structural model risk - broadly defined - will also embody operational and legal risks. Importantly, model risk will ultimately translate into potential pricing risk, to the extent that ratings influence pricing or that other market participants make use of similar assumptions in their pricing models. In both cases, model risk reflects structural specifics: given that investors need to understand the risk profiles of their actual investments, not generic ones, accuracy crucially depends on customized assessments of deal structures.

The Key Criticisms

Rating agency processes lack transparency:

Since 2002, both the volume and the complexity of RMBS and CDOs increased substantially with the confluence of the cash and synthetic markets leading to concern about the ability and willingness of the rating agencies (among others) to keep up with the pace of financial innovation. Growth led to rising revenues and ratings became increasingly dominated by mathematical models at the expense of fundamental analysis. Market participants increasingly found the quantitative assumptions underlying rating criteria lacking transparency and complained of rating agencies acting like a black box. Bad assumptions were made not just by the rating agencies but also by t bankers and investors.

The rating agencies were slow to act in the sub-prime crisis:

While the rating agencies did caution about problems in the sub-prime market as early as 2005, their warnings were often in low tones and were largely ignored. It took the collapse of the two Bear Stearns hedge funds and the huge markdowns of structured finance products in the inventory of Merrill Lynch and others for the rating agencies to take more aggressive rating actions. The SEC and the markets scored the agencies not only for the faulty rating criteria but also for inept surveillance processes after the initial rating had been assigned. Past rating agency stress tests for assigning high ratings have now been abandoned for far more draconian standards – too late for investors in securities that were too highly rated. The agencies should seek better means to assign ratings that do not just gyrate with the markets; rather they should adjust to fundamental changes in the marketplace so they have meaning over time, through business cycles. It has become fashionable to think that market prices and spreads can be reverse engineered to derive credit ratings. But if the reasons for the price drop have to do with liquidity issues rather than reasons for increased concerns over probability of default then market price driven credit ratings can also lead to errors.

Rating agency conflicts of interest

Over recent years, concern has been expressed by several observers regarding potential conflicts of interest in the ratings industry. Potential conflicts arise from the fact that ratings are paid for by issuers rather than investors, and from the fact that rating revenues represent most of the agencies’ total
revenues. Ratings also rely at least partially on issuer-provided information. Issuer-paid fees may thus encourage rating agencies to act in the issuer’s rather than the investors’ interest, resulting in initial ratings being more favorable or downgraded less often than they otherwise should be.

The main countervailing force, often cited by the rating agencies and others, is the need to establish and preserve a track record of ratings in the markets the agencies wish to serve. The agencies appear to be sensitive to the value of their reputational capital for future business and to market sanctions that would be associated with poor management of conflicts of interest. Their incentive to build and protect a reputation for quality services, therefore, serves as the main disciplinary device regarding conflicts of interest. On this basis, the agencies state that they seek to actively manage conflicts of interest through measures such as compensation arrangements that ensure that analysts are not rewarded on the basis of their ratings, internal rules that separate rating analysis from sales units, and efforts to diversify their revenue base and to avoid dependence on individual clients.

General implications
Market efficiency
Structured finance has extended the range of securitization activities and, in turn, contributed to the expansion of market-based financial intermediation. It has increased the liquidity of otherwise illiquid credit exposures and led to the creation of instruments with risk-return profiles tailored to investors’ specific requirements, given constraints or preferences. Overall, structured finance represents a move towards more complete financial markets, implying improved pricing efficiency and a more efficient distribution of credit risk.

Financial stability
Similar to other forms of risk transfer, structured finance improves the ability of market participants to manage financial risks more effectively. In turn, this allows these risks - at least in theory - to be better dispersed and more easily absorbed, suggesting that any shocks may increasingly be spread across a multitude of different market participants. In addition, structured finance gives investors the opportunity to better manage the risk of their investment portfolios, through broadened access to new asset classes and the ability to acquire instruments with tailored risk-return profiles. Yet, the scale of risk transfer that is actually occurring through structured finance can be overstated, particularly if originating institutions hold on to the equity tranches of the instruments they issue.

In addition, structured finance instruments transform risk, with the potential of magnifying the exposures of certain market participants who acquire these instruments. This raises the possibility that, instead of spreading risk more efficiently, the risk transfer that does occur could lead to undue concentrations, in that investors may wind up with positions that are riskier than they realize. The potential for underestimating risk is particularly present for structured finance instruments, where pooling, tranching and the involvement of different players require greater analytical rigor and more precise documentation than for other financial instruments. As a result, while these risks may be well understood by most of the “market”, problems may occur at the margin. Indeed, the assessment of pool credit risk remains an analytical challenge for all market participants, with the modeling of default correlation and spread risk remaining very much open issues.

Overall, if risk is inaccurately priced and exposures are concentrated in ways that are not fully appreciated by market participants; the occurrence of worst case scenarios could have systemic implications. Although the current scale of the more sophisticated structured finance activities is still quite small relative to other parts of the credit market, central banks may nevertheless want to be vigilant as markets continue to grow.
Market structure and discipline in the ratings industry

Structured finance ratings, just as traditional ratings, are part of a business exhibiting economies of scale. The importance of reputation and accumulated knowledge, the latter arising from access to the majority of marketed deals, tends to generate barriers to entry into the ratings industry and may help to explain the industry’s oligopolistic structure. At the same time, there is no obvious indication that market structure and related conflicts of interest have unduly influenced rating agency behavior, or curbed the market’s incentives to innovate.

Contestability of the market for credit risk assessment, reflected by the sophistication of other market participants such as arrangers, appears to provide motivation for the agencies to engage in ongoing development of their methodologies for credit risk modeling and their views on structuring. Nevertheless, as lack of competition is generally seen as weakening the power of market discipline, initiatives designed to lower non-market barriers to entry are to be welcomed.

Final Remarks

Structured finance markets and the non-bank financial intermediation services they provide have become an important part of the financial system. Issuance volumes have grown strongly over recent years and the dynamics of market development, together with the benefits afforded to issuers and investors alike, suggest that growth is likely to continue. This will contribute to market completeness, yielding more efficient pricing and an improved distribution of credit risk.

Rating agencies play a key role in structured finance markets. As in other financial markets, the agencies act as providers of third-party opinions about the riskiness of debt instruments, thus helping to overcome asymmetric information problems and improving efficiency and transparency. Yet, the rating agencies’ activities have the potential of being especially valuable in situations where investors face relatively high costs in assessing the structure and riskiness of a given instrument - that is, in structured finance. Indeed, ratings appear to play a more important role in structured finance than in traditional credit markets.

References:
1) “The role of ratings in structured finance: issues and implications” - Report submitted by a Working Group established by the Committee on the Global Financial System (Bank for International settlement - January 2005). This publication is available on the BIS website (www.bis.org). Bank for International Settlements 2005. All rights reserved. Brief excerpts may be reproduced or translated provided the source is cited.
4) State of the CMBS servicing market – Fitch Ratings Commercial mortgage special report.
5) Indian securitization Market Review - 2009-2010 (CRISIL Ratings)