

Moody's Approach To Rating Credit Card Receivables-Backed Securities

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SUMMARY

This report details Moody's methodology for rating credit card receivable-backed securities and is organized into three major sections:

1. Collateral analysis - an examination of the key collateral performance metrics used to model securitization cashflows including macro- and microeconomic factors.
2. Bond and structural analysis - an assessment of the key liability-side modeling metrics, including cashflow allocation features and bond structure elements.
3. Cashflow analysis - a detailed illustration of a hypothetical credit-card-backed security during an early amortization period.

The analytic approach presented herein applies generally to all countries and regions Moody's rates credit card receivable-backed transactions. Even so, clear distinctions in performance exist across the various jurisdictions. For instance, differences among the consumer credit cultures for the three principal markets in which Moody's rates credit card ABS (the U.S., the U.K. and Canada), result in demonstrably different performance metrics (e.g. payment rate, yield, charge-off rate) and, by extension, broadly distinct credit risk profiles. Usually, these differences are expressed in the relevant model inputs and not by variations in the rating approach.



HOW CREDIT CARD SECURITIZATIONS WORK

- Revolving pool, master trust
- Bifurcation of principal and income cashflows
- Allocation and distribution of cashflows
- Revolving, accumulating and amortizing periods

Credit card ABS structures are different from most other ABS asset types in several fundamental respects. First, since the mid-1990s virtually all credit card-backed securities are issued out of a master trust. A master trust is a semi-permanent issuance vehicle designed to issue multiple, discrete series of securities over time. Each series shares an undivided ownership interest in a common pool of collateral.¹ Investors in most other ABS types have an interest in a discrete pool of assets.

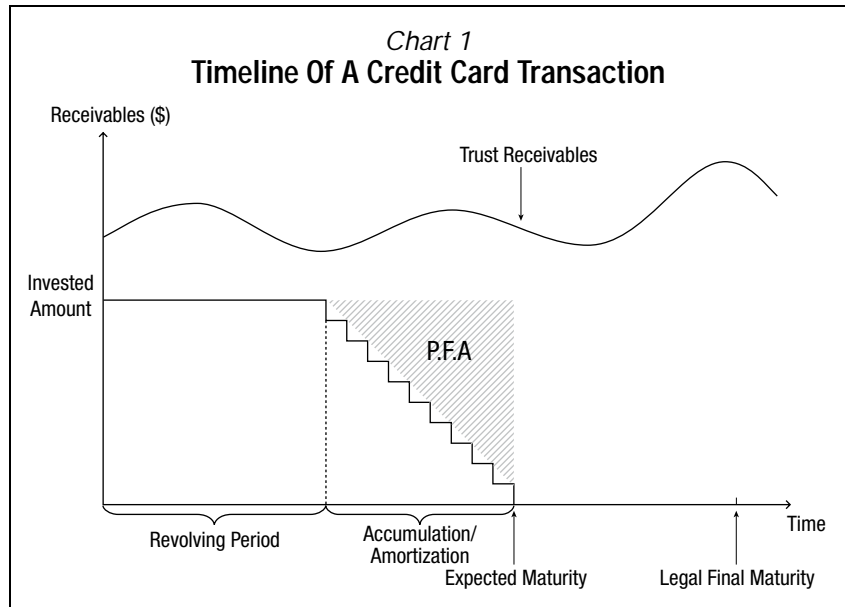
Credit card deals are also unique in that cardholder payments (i.e. collections) are first divided between the seller and the investors on a pro rata basis. These payments are then divided again into principal and income² cashflows.

Principal cashflows are either reinvested in newly generated principal receivables or used to repay investors. During the bond's "revolving" period, which is another structural distinction of the credit card market, principal collections are reinvested in newly generated principal receivables (i.e. new purchases made on cardholder accounts that have been designated to the trust). This reinvestment sustains the receivables level in the trust so that bond terms can extend well past the relatively short average life of a credit card receivable (see *Chart 1*).

During the accumulation/scheduled amortization period, principal cashflows allocated to a particular bond are no longer reinvested. Instead, a prescribed share (e.g. 1/12th, 1/18th, etc.) of monthly principal collections is either accumulated (i.e. held in a principal funding account ("PFA")) or paid to investors until the sooner of the expected maturity date or the occurrence of an early amortization event. Cashflows deposited to the PFA will be used to repay investors' principal investment upon the expected maturity date.

Collections allocated to income are used to pay deal expenses (e.g. bond coupon, servicing³, reimbursement of charged-off amounts, and the funding of special reserves). Income in excess of these expenses (i.e. "excess spread") flows back to the seller under most circumstances. If, however, income is insufficient to cover the deal expenses, the transaction may enter another phase - the amortization period.

An early amortization period is another concept incorporated in all credit card deals. It commences upon the occurrence of prescribed, potentially negative credit events (i.e. "payout events"). When an early amortization period begins, principal collections that would normally have been reinvested or deposited in the PFA are distributed to bondholders in order of seniority until the sooner of the final maturity date or when investors are fully repaid. Meanwhile, losses due to insufficient income are allocated to bondholders in reverse order of seniority.



¹ Collateral is primarily comprised of receivables that arise in credit card accounts designated to the trust.

² Income, in this context, typically includes finance (i.e. interest) charges, fees and interchange and, sometimes, recoveries.

³ In some jurisdictions (e.g. Canada) there is usually no explicit servicing fee paid as long as the portfolio continues to be serviced by the original seller or an affiliate.

De-Linked Trusts

The de-linked trust builds on the traditional, master trust structure. This trust type is now the preferred issuance vehicle for most large-scale, U.S. issuers, and has also been adopted by one issuer in the U.K. One of the signature features of a de-linked trust is that so long as the prescribed minimum subordination requirements are met, the issuance of senior and subordinate tranches may be independent of one another. This allows the issuer to tailor issuance to prevailing market conditions and to broaden its investor base. The potential investor base is broader because de-linked securities can be issued in the form of notes (debt instruments) rather than pass-through certificates (ownership entitlements). This allows U.S. pension funds, which are subject to the Employee Retirement Income Security Act of 1974 ("ERISA") - to more easily purchase the subordinate issues.⁴

COLLATERAL ANALYSIS

Moody's assessment of credit risk typically begins with an analysis of the economic, regulatory, legal, competitive and cultural factors that directly and indirectly affect collateral performance. Issuer-specific aspects of the analysis include an assessment of the organization's underwriting, risk management, and collections capabilities as well as a review of their customer service. For modeling purposes this assessment is condensed and expressed in a short list of key performance metrics:

1. Yield
2. Charge-off rate
3. Principal payment rate
4. Purchase rate

Moody's establishes the appropriate steady-state and stress levels for key credit variables by assessing credit performance through an economic cycle. Credit card performance often correlates to broader measures of the economy. For example, the unemployment rate, interest rate environment, debt service leverage, and consumer confidence are commonly cited as economic indicators that are especially relevant to credit card performance. Even so, the relationship (i.e. correlative strength) among these factors and credit card performance is complex and, in fact, changes over relatively short periods of time. Although the precise timing and duration of these types of economic factors are unpredictable, they do tend to be cyclical. By establishing "through the cycle" assumptions, Moody's considers the implications of various economic scenarios without bias to the prevailing economic conditions or forecasts.

An assessment of the legal and regulatory frameworks also provides important context to the collateral performance analysis. This is because many of the fundamental aspects of the credit card industry, including practices around marketing, underwriting, accounting and collections, are dictated by regulation or legislation - and they can differ significantly from jurisdiction to jurisdiction. As a result, changes to the legal or regulatory landscape can create meaningful differences in some of the fundamental performance variables. Usury and rate exportation laws, write-off recognition and re-age regulations, and consumer protection and personal bankruptcy laws are just a few examples of the way laws and regulations shape the credit card industry.

Most credit card originators are organized as banks. As a result, they operate as highly regulated institutions under the purview of one or more bank regulatory bodies (e.g. FDIC, OCC, FSA, etc.). Bank regulators have broad powers and have, over the years, used these powers to investigate and, in some cases, enforce changes in issuers' underwriting and risk management policies.

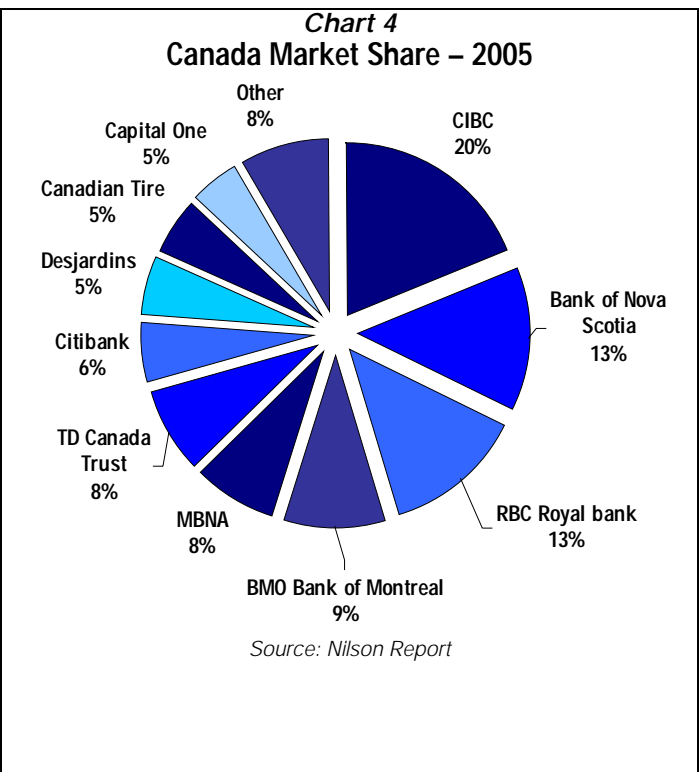
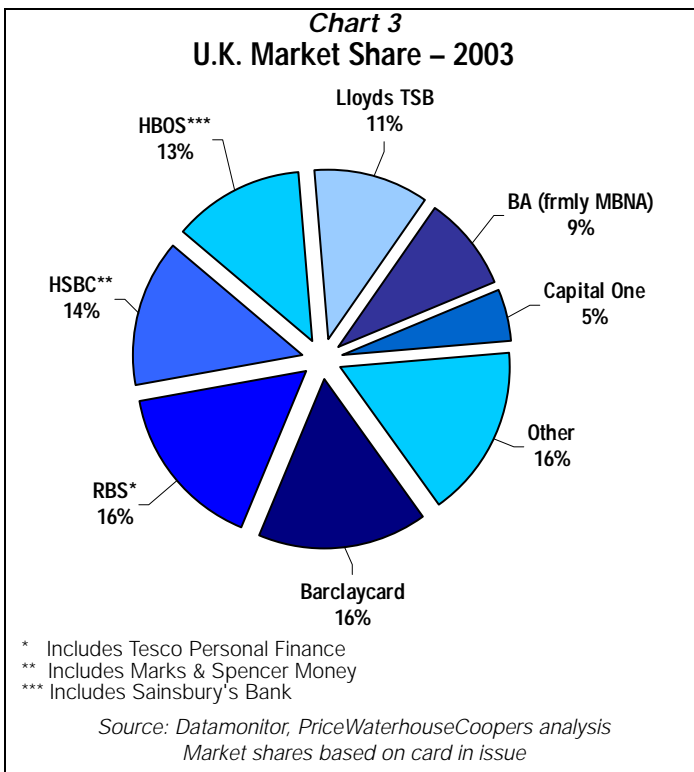
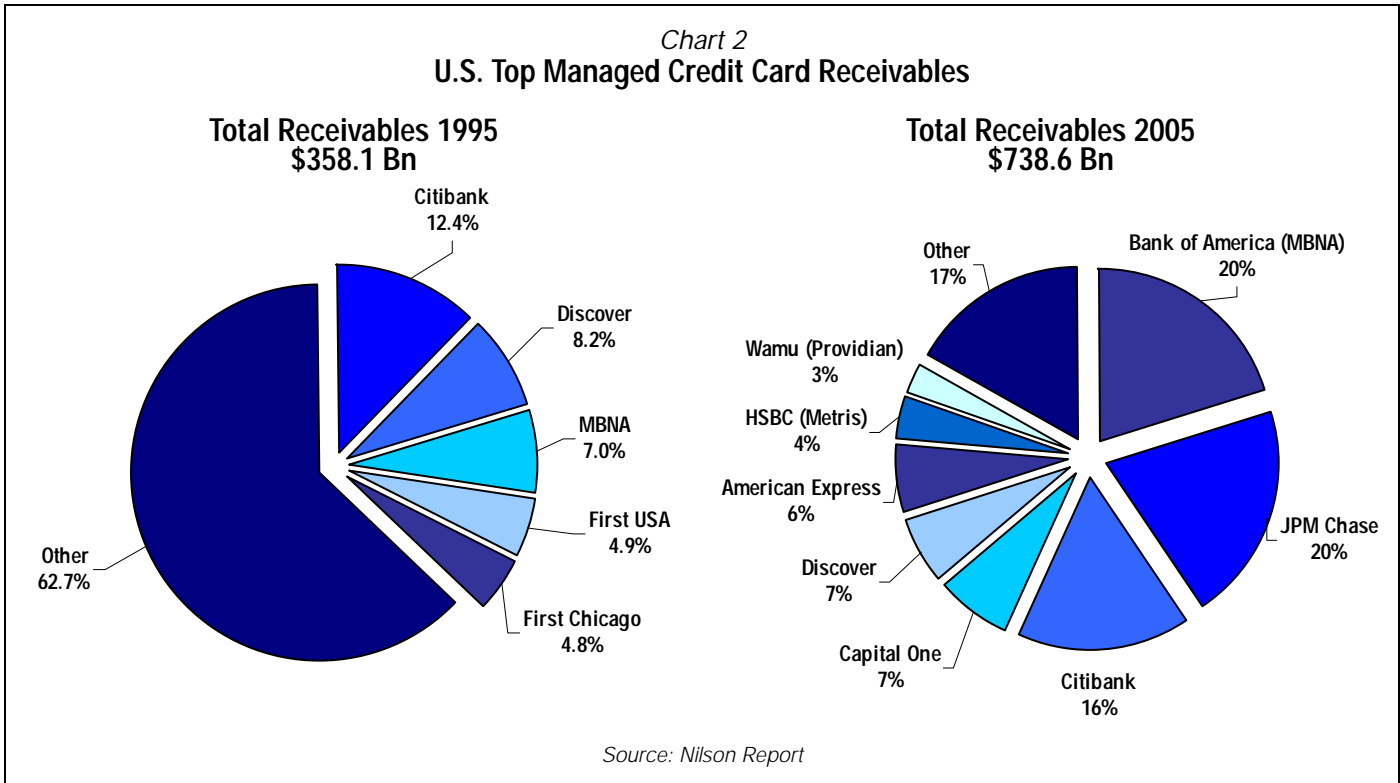
In a singular but defining case for the U.S. securitization market, the FDIC took a credit card bank into receivership and disallowed the commencement of early amortization based on a receivership-based trigger.⁵ Following this event, U.S. regulators have clearly stated that it deems such triggers unenforceable. As a result, some securitized deals have now removed amortization triggers tied to receivership. So far, no such analogue exists in either the Canadian or the U.K. markets.

The competitive landscape can also inform expectations for business decisions that may ultimately affect collateral performance. In the U.S., which is the largest and most mature credit card market, heightened competition led to considerable consolidation among card lenders as they went in search of scale to offset diminishing margins on a commoditized product. For example, the top five card issuers now comprise about

⁴ For more detail, please see Moody's Special Report, "[Note to Investors: Credit Card-Backed Securities Are Changing Color](#)," September 22, 2000.
⁵ Please see Moody's press releases for the securities issued from the NextCard Credit Card Master Note Trust; February 13, 2002, June 28, 2002 and January 17, 2003.

71% of the market compared to just 37% of the market ten years ago (see *Chart 2*). This push for scale also led some originators to lend to riskier obligors, which, in most cases, resulted in the predictable deterioration of collateral performance.

In other markets, such as in Canada and the U.K., a number of lenders have been influential in changing the competitive landscape (see *Charts 3 and 4*). As a result, credit card use (and revolving debt levels) in these countries has grown.



Issuer-specific aspects of collateral analysis include an assessment of the lenders' underwriting and credit risk management. For this part of the analysis, Moody's seeks a broad understanding of a lender's underwriting strategy. Most successful strategies employ a degree of flexibility to adapt and respond to the changing market conditions (e.g. competitive pressures, economic cycles, etc.), but are grounded in policies and procedures that provide management with enough control to accurately gauge risk. Some of the most common gauges include credit scores, vintage performance data, utilization rates, and credit line stratifications, many of which are published with a bond offering and updated periodically (see *Table 1* for a list of commonly published trust-related data). These data can provide an early indication of changes in underwriting or risk management strategies.

Similarly, the financial strength and quality of the seller/servicer is also incorporated in the credit risk assessment. Nearly all credit card originators are also the named seller/servicer for a given securitization. This dual role makes practical sense since the revolving nature of credit cards requires ongoing credit risk, servicing and collection decisions - functions that the originator, if assumed an on-going enterprise, is particularly well-suited to perform. Nevertheless, Moody's considers the risks associated with this dual role insofar as financial strength is deemed to influence card utility (i.e. the purchase rate) and other key performance metrics. Hence, the ratings on the ABS are loosely linked to the financial strength and credit quality of the seller/servicer.

<i>Table 1</i> Common Trust-Related Data
• Credit limits
• Outstanding balance
• Delinquency status
• Seasoning
• Geographic concentration
• Income stratification
• Utilization rate
• Credit scores
• Payment data (min. pay/full pay percentages)
• Static pool/vintage performance (charge-offs, yield, payment rate, and delinquency rate)
• Aggregate (non-vintage) yield, payment rate, charge-off rate, delinquency rate, and excess spread

Yield

For most credit card trusts, the gross portfolio yield is expressed as the annualized percentage of income collected during a given month divided by the total receivables outstanding at the beginning of the month. This income is used to pay transaction expenses, including the servicing fee, charged off amounts, coupon expense, and the funding of any special reserve accounts.

Credit enhancement is "drawn" when yield is insufficient to cover expenses, which may also trigger the early amortization of the securities.⁶ If such a shortfall persists, the credit enhancement may eventually be exhausted, and subsequent shortfalls would result in an investor loss. Therefore, the level of yield is a key variable in assessing the probability and extent of future shortfalls, the probability of an early amortization event, and the ultimate risk of credit loss to investors.

Total yield is generally composed of three distinct sources of income:⁷

1. Finance charges,
2. Fees, and
3. Interchange.⁸

Finance Charges

The finance charge component of yield is generated by the interest charged on outstanding credit card balances and is expressed as an annual percentage rate, or "APR"⁹. Typically, finance charges comprise between 50% and 85% of the total yield. Today, most card lenders employ technology that allows them to customize the APR (as well as other card terms) down to the individual cardholder level. Obligor-specific customization is based on any number of criteria, including self-reported demographic information (e.g. income, employment record, home ownership, etc.), credit bureau information (e.g. derogatory credit report), a change in purchase or payment behavior, a change in the interest rate environment, or simply due to a change in competitive pressure.

⁶ Typically, the early amortization trigger is based a shortfall calculated on a three-month rolling average basis.

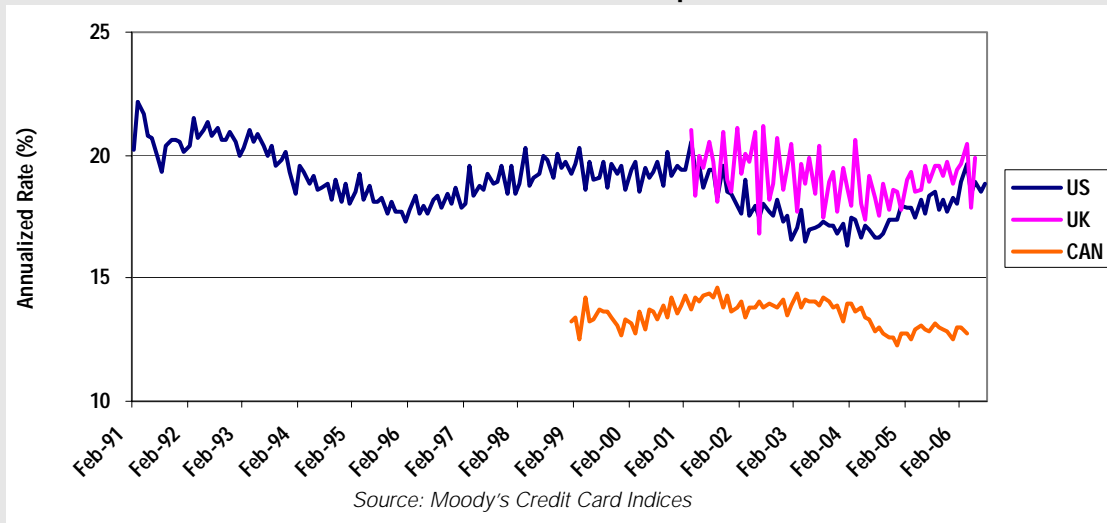
⁷ Recoveries on defaulted receivables are sometimes included in the reported yield (if not already included in the charge-off rate). Recoveries include the proceeds from sales of charged-off receivables as well as cardholder payments on defaulted accounts. Depending on the issuer, recoveries range from less than 50 to 200 basis points, expressed as an annualized percentage of the previous month's ending principal balance.

⁸ Some trusts do not include interchange as a part of the cashflows.

⁹ Nearly all credit card securitizations allocate cashflows on a cash rather than accrual basis. This feature is particularly important when considering the yield because there may be a considerable difference between that which is charged and that which is collected.

Over the years, issuers have made significant advances in the deployment of pricing technology. Risk- and performance-based pricing terms are now commonplace and allow issuers to respond to changes in credit and interest rate risk more quickly and with more precision. That compares favorably to the now-outdated "one price fits all" pricing model. Also, for many issuers fixed-rate card terms have given way to variable-rate terms, which can provide an additional degree of interest rate protection. Further, the ability to quickly and systemically re-price a credit card portfolio can reduce the credit risk in card transactions. These more timely and effective risk management tools should result in a less severe yield stress, and, by extension, lower credit enhancement levels.

Chart 5
Yield – An Historical Perspective



The reported yield is influenced by a number of disparate factors, including: the interest rate environment, competitive pressures, regulation, innovations in card product offerings, and changes in credit card usage. Historical yields for the U.S., U.K. and Canada markets have been relatively stable. In recent years, yields in the U.S. and U.K. have remained, on average, in the upper teens. The yield on Canadian portfolios, by contrast, has been appreciably lower averaging between 13% and 14%. This difference is mostly due to a reporting convention for the Canadian index that excludes the interchange component of yield. Also, the finance charge component of yield for high payment rate portfolios (like many in Canada) are typically lower than yields on lower payment rate portfolios, all other things being equal.

Credit card pricing has improved significantly (in all jurisdictions), which allows issuers to respond to changes in credit and interest rate risk more quickly and with potentially more precision. For example, today most issuers' underwriting and risk management strategies employ transaction- and obligor-specific risk-based pricing mechanisms. That compares favorably to the now-outdated "one price fits all" pricing model. Also, fixed-rate card terms have given way to variable-rate terms, which can provide an additional degree of interest rate protection.

In recent years in the U.S., for example, the yield has directionally followed changes in short-term interest rates - albeit on a lagged basis. Over the same time period, competition, which is manifest in the proliferation of introductory "teaser" rate offers as well as the relative absence of the once-common annual fee, has increased downward pressure on yield.

Changes in card usage have also influenced yield. This is especially pronounced in the U.S., where more and more cardholders use cards not just as credit, but for convenience (i.e. as a substitute for cash). Hence, the amount of yield derived from finance charges has fallen (all other things being equal), while the amount derived from interchange has risen.

Even though, on an aggregate basis, card terms can be and are routinely changed, it is not easy to predict the ensuing cardholder response and impact on portfolio performance. For example, an increase in the APR charged to cardholders will increase collections on those who are able to pay, but it may also push others into default. Predicting which obligors will be able to pay the increased APR is a challenge. Likewise, discretionary increases to APRs must remain competitive or the better quality obligors (who are more likely to be solicited)

may be lured away by a competitor's lower-rate card offer, thereby leaving the portfolio with a relatively higher proportion of lower quality obligors - a result referred to as adverse attrition.

Fees

The portion of yield derived from fees, which includes late payment fees, over-the-limit fees, and annual "membership" fees, among others, varies significantly from card type to card type and from portfolio to portfolio. For example, portfolios composed primarily of sub-prime obligors tend to have a higher proportion of cardholders who incur late fees. Portfolios of premium reward cards (e.g. airline, cash and rebate cards) typically have higher than average annual fees.

Competitive pressure and regulatory controls, too, may influence the amount of annual fees collected for a particular card program. Cardholders' willingness to pay recurring annual or membership fees will depend on their perception of the card's value proposition. If the value proposition diminishes (e.g. a co-branded partner goes out of business) - cardholders are less likely to pay. Likewise, regulations, which are subject to change, may restrict fee-derived income.

In any case, a fee charged is not necessarily a fee collected. That's because seller/servicers often "forgive" late fees as a customer service, collection or balance retention technique.

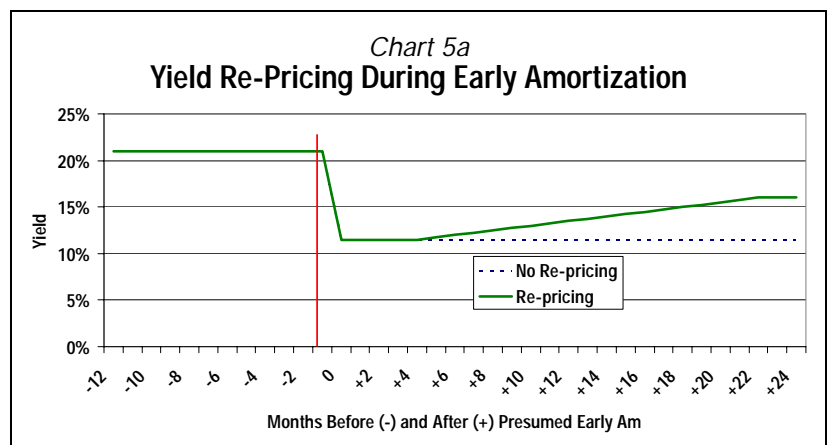
Interchange

Interchange is a fee received by the credit card banks from merchants for accepting credit risk, absorbing fraud losses and funding credit card receivables for a limited period before initial billing. These fees may be changed by the associations that run the payment networks (e.g., MasterCard and VISA). The interchange component of yield is typically quite small (e.g. ~2%); however, since interchange is earned on the volume of charges (and not the outstanding balance), portfolios with a high proportion of convenience users will have a disproportionately high proportion of interchange-derived yield¹⁰. Also, portfolios of small business or charge cards (as opposed to consumer cards) usually generate a much higher proportion of interchange because the interchange rate is set higher for this type of card. The proportion and sustainability of the interchange component are important considerations of this aspect of the yield cashflow analysis.

The regulatory environment has also become an important consideration in some jurisdictions. The imposition of industry-wide limitations on the interchange rate creates volatility around the assumptions of this component of yield income. For these reason, Moody's has not ascribed much, if any, value to the interchange component of yield.

Stressing Yield

In evaluating credit enhancement levels, Moody's considers the likelihood of downward pressure on each of the three major components of yield as well as the issuer's ability to reprice the portfolio during a presumed and coincident increase in interest rates.¹¹ In a stress case scenario, it is anticipated that finance charge collections will initially fall due to any of an assumed increase in delinquent borrowers, a reduction in market interest rates or an increase in competitive pressures. Assumptions about the ability to re-price during this rising rate stress scenario are tailored to the features of the subject credit card portfolio (see *Chart 5a*).



The magnitude of the assumed drop-off depends on such factors as the obligor credit risk profile. For example, sub-prime obligors are generally charged a higher APR, pay higher fees and are more likely to fall behind in their payments than are prime card borrowers. Also, revenue derived from ongoing fees, which may be forgiven at

¹⁰ A higher proportion of convenience users will also tend to lower the finance charge collection component of yield.

¹¹ See *Coupon*, below, for a detailed account of the presumed increase in interest rates.

the servicer's discretion, may be ephemeral during certain stress scenarios, especially those in which cardholders' charging privileges are revoked. Hence, the finance charge and fee components of a sub-prime pool are generally stressed more severely than that of a prime card portfolio.

As discussed above, competitive pressures, the ongoing value proposition of the card, and the relative proportion of these fees, among many other factors, are important considerations for the appropriate stress to the yield. All three of these key components of yield are sensitive to cardholder purchase behavior. In general, Moody's analyzes the effect of a stress equivalent to between a 40% and 70% reduction in the expected portfolio yield during the wind-down period. This stress can reduce the yield on prime portfolios to as low as 11.5% and slightly higher on subprime pools.

Since Moody's presumes rising interest rates during a stress scenario, it is reasonable to assume that some issuers may be able to re-price their portfolios and thereby mitigate the initial drop off in yield presumed at the start of the early amortization period. For this part of the analysis, the portfolio receivables are divided into two categories - those subject to variable rate terms and those that are not. The ability to re-price depends on, among other things, the relative proportions of receivables subject to variable and fixed rate card terms.

Variable rate card terms permit automatic and systemic price changes, but even this seemingly straightforward analysis bears further scrutiny. In an early amortization scenario, the ability to manage yield may be hampered by the potential inability to generate interchange, certain ancillary fees, and even to re-price. A spike in delinquent accounts will also decrease cash-based yield. Even more, the ability to re-price may be restricted in the future due to legislative action, and the current bias in favor of variable rate cards may not be permanent.

Table 2 demonstrates how **Aaa** credit enhancement levels would change when the stressed yield is allowed to increase in response to an assumed increase in interest rates.¹² The "lag" is the number of months it takes the yield to respond to the rise in interest rates. The "pass-thru" factor is a measure of the correlation between yield and interest rate environment. The changes to credit enhancement are relative to a base case. For example, if for every point of increase in the interest rate the yield increases 6 months later by half (0.50), then the **Aaa** credit enhancement could drop by 0.48% (circled).

passthru	Lag in Months			
	1	3	6	12
0.00	0.00%	0.00%	0.00%	0.00%
0.25	-0.79%	-0.52%	-0.24%	-0.02%
0.50	-1.47%	-1.00%	-0.48%	-0.04%
0.75	-1.84%	-1.30%	-0.67%	-0.06%
1.00	-2.05%	-1.47%	-0.78%	-0.07%

Charge-Off Rate

The charge-off rate measures those credit card account balances written off as uncollectible as an annualized percent of total loans outstanding. A number of diverse factors influence the charge-off rate, including underwriting standards and collection activity, regulatory guidelines, legislative changes, and economic factors such as unemployment and debt service leverage.¹³

Cardholder balances are written off once they are deemed uncollectible in accordance with the servicer's policies and procedures. These policies and procedures are often (but not always) governed by industry regulatory bodies. For example, in the U.S., since most seller/servicers are banks, they must adhere to a set of policies and procedures prescribed by the Federal Financial Institutions Examination's Council ("FFIEC").¹⁴ The FFIEC regulations require, among other things, that cardholder balances be written off if contractually delinquent for a period longer than 180 days. Also, if a cardholder files for bankruptcy protection, the related card balance must be written off within 60 days after the bank receives notice of the bankruptcy.¹⁵ The FFIEC regulations also govern the policies and procedures for re-aging¹⁶ delinquent balances. Since nearly all seller/servicers follow the FFIEC guidelines, the reported loss and delinquency rates are comparable across issuers.

¹² Interest rates are assumed to rise for transactions with a floating rate coupon.

¹³ Interest rates are assumed to rise for transactions with a floating rate coupon. See *Coupon*, below, for more detail.

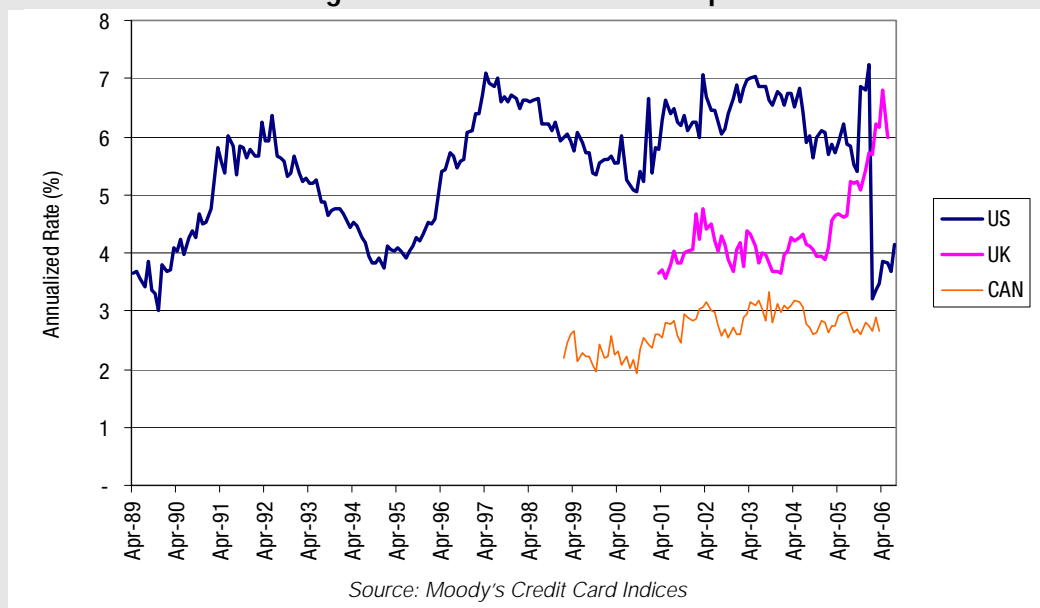
¹⁴ For those seller/servicers that do not fall under the purview of a bank regulator, write-off and re-age policies must be reviewed carefully and assessed on a case by case basis.

¹⁵ Write-offs attributable to bankruptcy filings comprise a significant proportion of the total reported loss rate - about 30% to 50% for most issuers.

¹⁶ Re-aging generally refers to the minimum payments required to bring a delinquent account into current status.

From a securitization perspective, card balances written off as uncollectible reduce the principal balance (i.e. collateral) of the receivables in the trust. These reductions are normally replenished through a structural provision that re-characterizes available finance charge collections as principal collections. If, however, available finance charge collections are insufficient to cover the charged off amount, an early amortization event is triggered and the related bonds will begin to pay down. Then, if the bonds are not repaid before losses exceed the available credit enhancement, bondholders will take a loss of principal.

Chart 6
Chargeoff Rate - An Historical Perspective

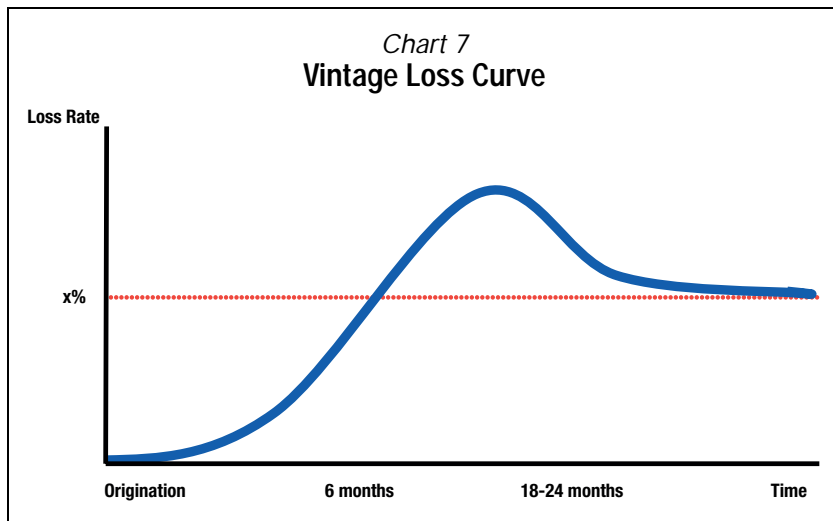


Clear differences among the three countries' credit cultures are manifest in the historical charge-off rates, above. In the U.K., for example, personal bankruptcy filings comprise between 10% and 30% of the total charge-off rate. In the U.S. and Canada, the proportion of losses attributable to bankruptcy filings is much higher - between 30% and 50%.

Canadian charge-offs, which have ranged between 2% and 3% have remained appreciably lower than in the other two countries. Canadian issuers have historically been more selective when extending credit. Competitive pressure, especially from U.S. issuers expanding their presence in Canada, may compel some issuers to move down the credit curve to grow their portfolios.

U.K. charge-offs rates, though higher than those in Canada, were, until recently, also well below rates in the U.S. Now, the U.K. is in the midst of a negative consumer credit cycle, which has resulted in a rapid increase in loss rates over the last 24 months.

In the U.S., the charge-off rate has generally trended higher over the past fifteen years. As issuers have sought to grow their franchises, they have, in effect, "democratized" credit by lending to a broader (and riskier) part of the credit quality continuum. Issuers have developed and employed sophisticated technology that allows them to identify, parse and price for this incremental risk with a greater degree of precision. Trends in the historical charge-off rate have been influenced by exogenous events, like the recessions of 1991 and 2001. Endogenous events, like intensified competition, have also contributed to at least one pronounced increase in losses in the mid-1990s. Contributing to this increase was a drive for scale and market share via organic growth, which led some issuers to lend to riskier obligors. This period was also coincident with a pronounced proliferation of consumer bankruptcy filings, which comprise up to half of the total reported charge-off rate. In late 2005, charge-off rates rose appreciably due to a change in the consumer bankruptcy law. Effective in October 2005, this new law pulled forward many of the bankruptcy filings that would have occurred after the new law became effective. Hence, the dramatic surge in filings has been followed by a dramatic fall off in 2006. The lingering effects of the bankruptcy reform are expected to abate over time, though it remains unclear as to when a new steady state pace of filings will be achieved and what that level will be.



A vintage loss curve is a useful way of depicting the typical loss trends of a static group of accounts over time (see *Chart 7*). The loss curve of a static portfolio of credit card accounts usually follows a predictable trend, and for this reason, loan seasoning data is an important consideration when analyzing current and future charge-off rates. A given portfolio's vintage charge-off rate typically starts out low and then increases rapidly as the "bad" loans approach write-off status (e.g. 180 days past due). In most cases, loan losses peak after about 18 to 24 months, after which they fall to a relatively lower, "steady state" level for the remaining life of the loans.

Stressing Charge-Offs

In its stress cases Moody's analyzes the effect of a sharp increase in charge-offs on the pool. Charge-offs are stressed immediately to twice their expected level, and assumed to continue to rise over time. Ultimately they are assumed to rise to a level up to three to five times their expected rates. The magnitude of the stress multiple depends on, among other things, the volatility in historical loss rates, the seasoning of the accounts, and the marketing and underwriting strategies of the card issuer.

Principal Payment Rate

The principal payment rate measures the pace at which cardholders pay back their outstanding balances.¹⁷ During the revolving period, monthly principal collections are generally used to purchase new receivables (generated by new cardholder purchases on accounts designated to the trust) for the master trust when they are not needed by notes that are amortizing or accumulating for a future payout. From a noteholder perspective, the payment rate is important because it is a measure of the "speed" by which investors are repaid in an early amortization event when payments are used to pay back bondholders rather than to purchase new receivables.¹⁸ The higher the payment rate, the shorter the time investors will be exposed to their *pro rata* share of losses on the pool. Moody's focuses its analysis on the principal portion of the monthly collections, since it is the principal collected which will be used to pay down the investor's principal outstanding.

A number of factors influence the principal payment rate, including the minimum payment terms of the card issuer, the proportion of delinquent borrowers, and the proportion of convenience users (cardholders who pay off their balance each month) and minimum payers (those who pay only the contractual minimum each month) (see *Appendix B*).

The contractual minimum payment rate for most credit cards requires a monthly payment of approximately 2% or 3% of the current balance. Clearly, the higher the proportion of minimum payers, the lower the average payment rate for the portfolio. Likewise, a relative increase in the proportion of delinquent borrowers will also lower the average payment rate. Conversely, obligors with a 100% payment rate (a.k.a. convenience users) will increase the average payment rate of a given portfolio. The question remains: what proportion of each of these obligor groups will remain in the portfolio during a stressful environment and an assumed early amortization of the trust?

Stressing Payment Rate

Moody's uses issuer-supplied and publicly available data, to the extent available, to bifurcate the trusts into a rewards segment and a generic (non-rewards) segment. The distinction between rewards and non-rewards

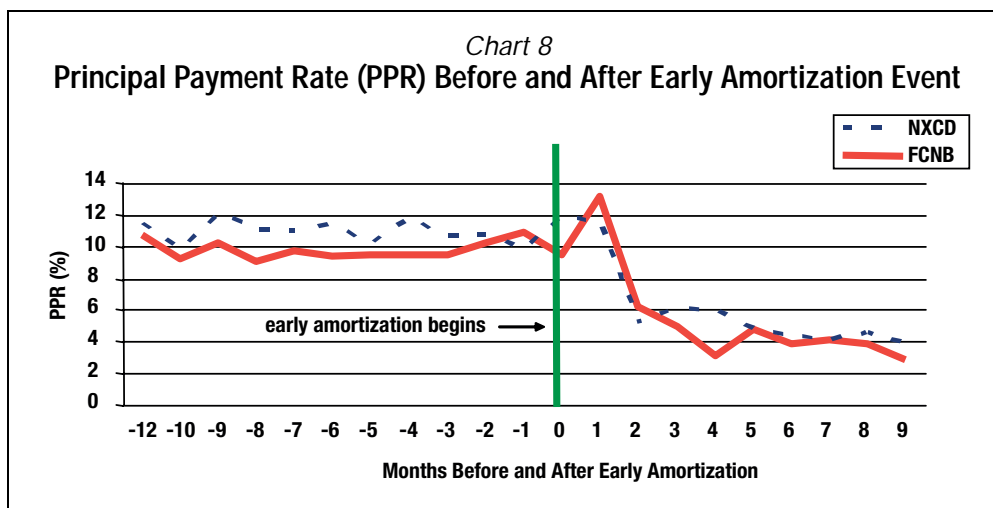
¹⁷ The principal payment rate is expressed as the monthly principal collections as a percentage of the principal receivables outstanding at the end of the preceding month.

¹⁸ A relatively high payment rate may not speed the repayment of principal for deals in the U.K. due to a regulation that limits the monthly allocation of principal to investors (e.g. 1/12th or 1/18th).

cardholders can be important because those that participate in a rewards program (e.g. airline miles, cash back, etc.) typically exhibit superior credit performance (i.e. higher payment rate) than non-rewards cardholders. The analytic framework for evaluating these two segments is based on several factors, including the relative value of the rewards product(s) and the sustainability of the relative mix and performance of the rewards segment during a presumed early amortization period. Ultimately, the stressed payment rate for the trust will be based on the weighted average of stressed, floor payment rates ascribed to the rewards and generic segments. The higher the proportion of sustainable convenience use in a given portfolio, the higher the assumed payment rate during the presumed early amortization period. Even small changes to the stressed payment rate assumption can have a relatively large impact on the resulting **Aaa** credit enhancement, all other things being equal.¹⁹ Moody's stress assumes payment rate declines in the range of approximately 75% or more of the expected levels, depending on the characteristics of the individual pool.

Issuers are not required to supply Moody's with any additional information regarding the rewards (or any other) aspect of their portfolios in order for Moody's to ascribe benefit for this feature. In some cases, limited data regarding specific rewards programs is publicly available. Also, "full pay" statistics - now required of issuers that are Regulation AB compliant - may be used to approximate convenience use. To the extent additional data can be provided (thus reducing this uncertainty about the reward products), it is more likely that an incremental benefit will be ascribed to this portion of the portfolio.

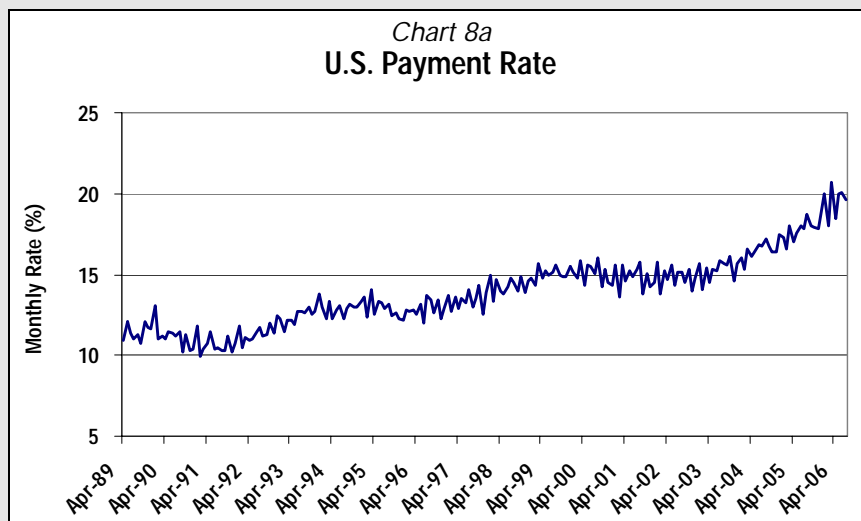
In a very severe scenario where charging privileges are revoked due to the insolvency of the originator, the proportion of convenience users will fall dramatically. The loss of these stronger-credit obligors will leave bondholders exposed to the remaining pool of weaker-credit obligors, resulting in lower monthly collections (i.e. lower payment rate), slower amortization and greater likelihood of loss. The limited empirical data available for this type of scenario supports a conclusion that the payment rate will drop precipitously. Two such examples are the NextCard Credit Card Master Note Trust and the First Consumers Credit Master Trust. In both cases, the originating bank terminated cardholders' ability to make additional purchases after breaching an early amortization trigger (see *Chart 8*). For these reasons, Moody's stress assumes payment rate declines in the range of approximately 75% or more of the expected levels, depending on the characteristics of the individual pool.



19 Please see *Table 10* in Appendix A for an example of the sensitivity of credit enhancement levels to various payment rate assumptions.

Explicit Incorporation of Convenience Use for U.S. Market Only

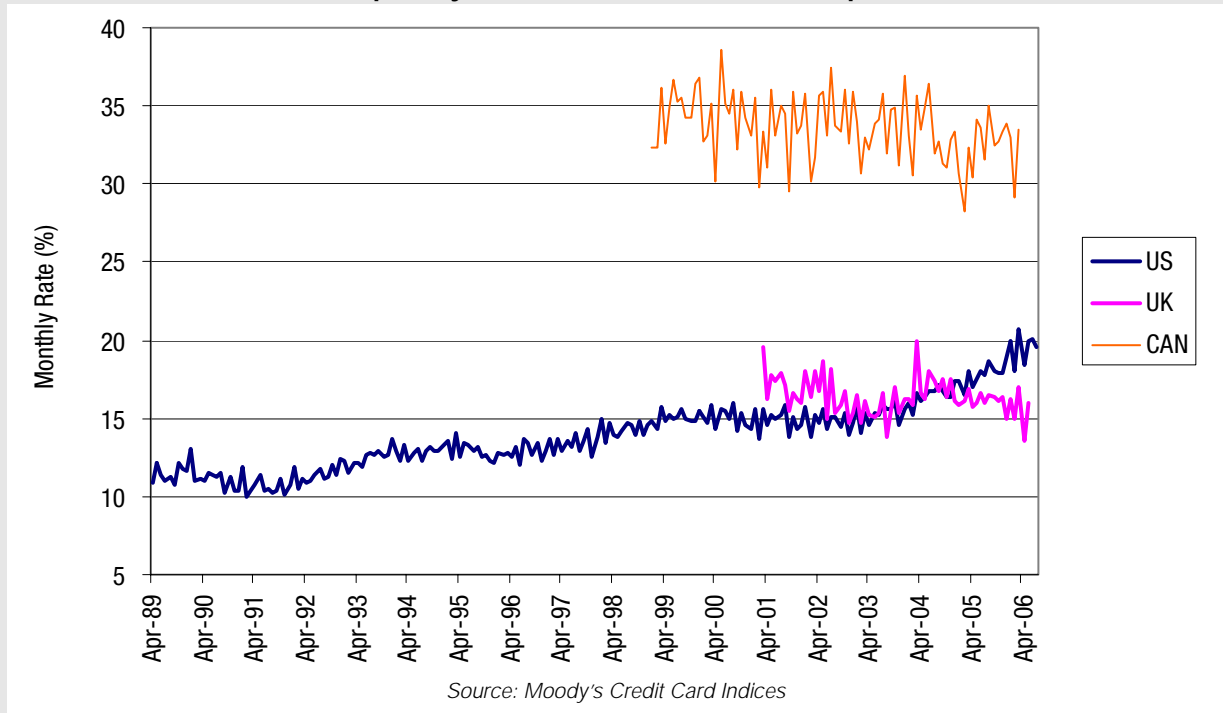
The explicit incorporation of convenience use in Moody's analysis of the payment rate is relatively new and, for now, applies only to the U.S. market. In the U.S., a near-doubling of the payment rate in the last fifteen years is particularly emblematic of a fundamental change in the way credit cards are used (see *Chart 8a*). The growth and evolution of the credit card market - marked by a proliferation of innovative card products (e.g. co-brand



and rewards cards) and merchant acceptance (for "everyday" purchases such as groceries, gas and e-commerce) - have led to a rise in convenience use. As a result, credit cards have become an increasingly attractive substitute for cash and checks. Even if current payment rate levels are not sustainable due to the end of the mortgage refinance boom, Moody's believes the long-term average will remain appreciably higher than in the past. The proposed modifications to Moody's current modeling approach provide a more nuanced analytic framework for evaluating these changes in the payment rate. Specifically, the new approach will explicitly incorporate the sustainable, convenience-use segment of a given portfolio, which may result in a less stressful "floor" rate and, for some trusts, lower credit enhancement levels compared to those derived from Moody's current stresses.

In contrast, payment rate trends in the U.K. and Canadian markets have not tracked that in the U.S. Payment rates in the U.K. have remained relatively stable over the long term and, although in recent years, have been falling slightly. Also, structural features regarding principal allocations that are unique to the U.K. market prohibit the allocations above prescribed rates and therefore greatly limit the effect of incorporating convenience use in the stressed payment rate (please see Cashflow Allocations, below, for more details). In Canada, payment rates have remained stable and are relatively high - a fact that has, to a degree, already been incorporated in Moody's cashflow modeling assumptions. Likewise, incorporation of convenience use may also not be relevant in Japan since market convention typically excludes the convenience-pay receivables from the securitization pool.

Chart 9
Principal Payment Rate - An Historical Perspective



The historical payment rate statistics illustrate a fundamental difference between borrower behavior in the U.S. and U.K. compared to that in Canada. The difference is partly due to Canadian issuers' preference for prime and super-prime borrowers, but it is also a product of Canada's distinct credit culture. Canadian cardholders are much more likely to use credit cards for convenience rather than for credit.

By contrast, obligors in the U.K. have embraced this access to credit and have loaded up on an unprecedented amount of unsecured debt. A higher debt service burden has caused some borrowers to fall behind in their payments, which may explain the recent drop in the monthly payment rate. This most recent negative credit cycle has so far not been exacerbated by broader economic deterioration.

In the U.S., the historical principal payment rate has undergone a pronounced change. The payment rate has risen from about 10% in the early 1990s, to the high teens in 2006. This rise has, in part, been due to factors like the recent mortgage refinance boom and the proliferation of balance transfer offers. Another component of the rise in the payment rate has been a rise in the proportion of convenience users (those who pay off their balance each month) due to the proliferation of reward-based cards and the wider acceptance of credit cards as a means of purchase in places such as grocery stores and gas stations.

Purchase Rate

The purchase rate is a measure of the amount of new cardholder charges each month, expressed as a percentage of the receivables outstanding. Purchases (i.e. receivables) on accounts designated to the trust add to the trust balance thereby mitigating (if not entirely offsetting) other cardholder actions that reduce the trust balance (e.g. payments, dilutions and losses). From a cashflow perspective, this addition to the trust balance is of critical importance because the greater the trust balance during amortization, the greater the principal allocation to bondholders.

The purchase rate is a function of the card's utility. If a card's value proposition diminishes, then purchases will likely fall. For example, the purchase rate of a reward card (e.g. airline miles card) is only as strong as the deemed value of the reward. Likewise, the utility of a private-label card is inextricably linked to the viability of the related retailer.

The financial strength of the seller/servicer can also affect assumptions about card utility and the purchase rate. The securitization provides funding for new purchases so long as the deals are revolving, but once an amortiza-

tion event occurs, the newly-generated receivables must be financed by the seller/servicer. During a trust-wide amortization, the securitized notes begin to pay down and the seller/servicer may, in a matter of months, be required to finance billions of newly generated receivables without the benefit of having access to the securitization markets. If liquidity and alternative financing sources are not sufficient, the seller/servicer may have no choice but to revoke cardholders' charging privileges.

No matter what the cause, if credit card utility is restricted or cut off, bondholders are exposed to credit losses over a longer period of time because remaining principal payments will be based on a smaller pool of receivables and will therefore take more time to generate the collections necessary to pay down the bonds. As a result, the purchase rate during amortization, then, is an important input in evaluating credit enhancement levels.

Private Label/Retail Card Portfolios

Private label (a.k.a. retail) credit card portfolios require special consideration with respect to card utility and purchase rate assumption. Traditionally, private label cards can only be used for purchases at the related retailer; therefore, the utility of the cards is linked to the on-going viability of the retailer. The weaker the financial strength of a given retailer, the more severe is Moody's purchase rate assumption during early amortization.

Of course, not all private label trusts are comprised of a single program from a single retailer. Several banks that specialize in the retail card sector have amassed large and diverse portfolios comprised of a dozen or more private label credit card programs. For these third-party private label trusts, Moody's focuses on contract risk (i.e. the risk that a retailer may not re-sign with the issuer), retailer default risk, and the relative concentration and diversification of retailers included in the portfolio when analyzing card utility and the purchase rate. Loss of card utility for these large, diverse multi-card trusts is considered much less at risk than for those trusts comprised sole retailer's single-card program.

In recent years, many private label card issuers have begun to offer co-branded credit cards. These cards offer the utility of a general-purpose credit card (they can be used virtually anywhere and are not limited to purchases at the retailer). Even so, Moody's considers the potential loss of card utility in the context of a stressful scenario. Although card utility may be preserved even in the event of a retailer bankruptcy, it is reasonable to assume that the value proposition to cardholders will diminish. Hence, the utility and purchase rate assumption is, again, somewhat linked to that of the financial strength of the related retailer.

Stressing Purchases

During amortization, the assumed purchase rate can range from a "constant" to a "fully declining" pool (or anywhere in between). A "constant" pool purchase rate assumption implies a sufficient amount of purchases to maintain the trust balance from the beginning to the end of the amortization period. This assumption is generally reserved for experienced, financially strong credit card originators with large, diverse portfolios of prime receivables. On the opposite end of the spectrum, the "fully declining" pool assumption simulates no new purchases and the trust balance therefore decreases rapidly due to payments, losses, and dilutions. This assumption is generally reserved for comparatively inexperienced, weak (e.g. sub-investment grade) credit card originators that have small portfolios and limited sources of financing outside securitization. Another consideration is the franchise value of the portfolio, which would be a factor in the relative salability of the portfolio if the bank is taken into receivership. Portfolios deemed to have a strong franchise value are more likely to be sold to a bank that would continue to finance new purchases on all or a portion of the portfolio.

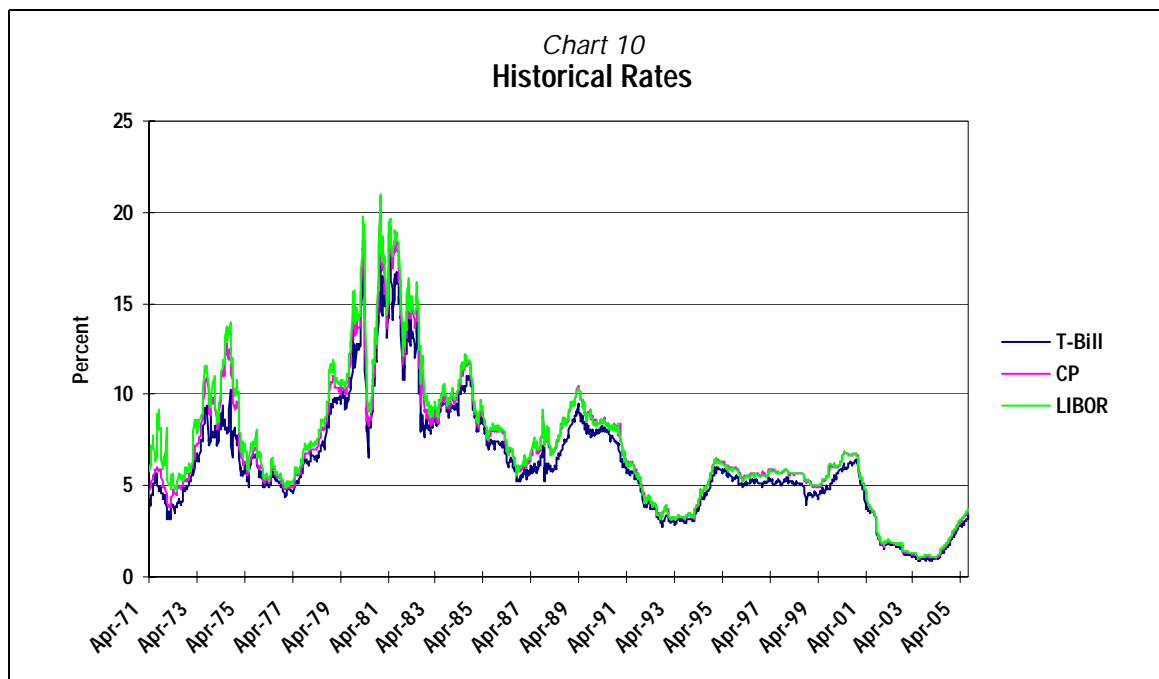
BOND AND STRUCTURAL ANALYSIS

Coupon

For most credit card transactions, available cashflows are allocated to the interest (a.k.a. coupon) expense at or near the top of the payment waterfall. For note transactions, missing a coupon payment results in an event of default,²⁰ which conveys to bondholders the right to accelerate the affected debt. Also, like the servicing fee and charge-off rate, the coupon rate is an important component of the performance-based early amortization trigger.

²⁰ Trust terms usually permit a 5- to 30-day "cure period" before an event of default is declared.

Coupons can be structured on either a fixed or floating rate basis. Due to the uncertainty of future interest rates, an issue with a fixed coupon rate is more predictable (i.e. less risky) than one with a floating coupon rate, all other factors being the same. A rise in the coupon rate may create incremental credit risk if issuers are unable to re-price their credit card portfolios (i.e. increase yield) to cover the rise in funding costs. Floating rate coupons are tied to short-term indices (e.g. 1- and 3-month LIBOR) that may vary considerably over a given period of time. For example, in the early 1980s, U.S. short-term rates rose into the upper teens (and beyond, in the case of 3m-LIBOR, see *Chart 10*). A rise in the coupon expense while a bond is amortizing further stresses the available finance charge collections allocable to this and other important deal expenses.



To measure the incremental risk posed by a floating rate coupon, Moody's assumes a rising interest rate environment during the amortization period. Although there are an infinite number of possible interest rate scenarios, the magnitude and volatility of the increase is predicated on empirical data. In a typical stress, for example, interest rates are assumed to rise from current levels to the mid-teens over the period of 18 - 36 months. The outcome of this kind of stress varies from transaction to transaction, but, on average, results in **Aaa** credit enhancement levels that are 3% higher compared to an otherwise identical fixed rate transaction.²¹

When a Fixed Rate Coupon Doesn't Mean Fixed Rate Risk

Not all bonds with a fixed rate coupon have a correspondingly lower "fixed rate" level of credit enhancement. In a de-linked trust, each bond has a floating rate level of enhancement regardless of the specific note's fixed- or floating-rate coupon. In a de-linked trust, the bonds are subject to the same degree of credit risk because the excess spread-based early amortization trigger is calculated on an aggregate basis, using the weighted average coupon expense across all outstanding notes. To date, issuers have chosen to enhance all notes (even those with fixed rate coupons) to the floating rate level.

Swaps and Caps

Though not the focus of this methodology report, issuers often use derivative products such as interest rate swaps and caps to either mitigate exposure to increases in interest rates or to meet prevailing investor preferences. When used in this fashion, Moody's evaluates their efficacy by considering a number of important aspects of the underlying derivative agreement, such as²²

- Counterparty rating,
- Counterparty replacement triggers, and
- Agreement of derivative and bond tenor and duration.

²¹ Generally, the difference in credit enhancement between a fixed and floating rate deal is reduced as the transaction moves down the capital structure from senior to subordinate classes.

²² For a more fulsome description of Moody's analysis for derivative counterparties, please see "[Framework for De-Linking Hedge Counterparty Risks from Global Structured Finance Cashflow Transactions Moody's Methodology](#)," May 25, 2005.

In some cases, the derivative reduces the risk of loss to investors and a reduction in the required credit enhancement level may be warranted. For example, if a bond's coupon has been swapped from a floating rate to a fixed rate, then the credit enhancement may be lowered to the corresponding fixed rate level.

Servicing Fee

Given the relatively short average life of credit card collateral, even a relatively brief interruption in servicing could result in credit losses on the related bonds. Consequently, an important component of Moody's bond rating analysis includes an assessment of the quality of the servicer, adequacy of their (or a successor's) compensation, and the circumstances under which the servicer may be replaced.

In most markets,²³ the servicer is compensated each month from available finance charge collections. Usually, the operative documents express the servicing fee as a percentage of the invested amount for a given series (most commonly 2%). To help ensure proper incentive to the servicer (or successor servicer), the servicing fee is almost always given first priority in the waterfall to all other allocations of available cashflows.²⁴

Moody's approach to assessing servicer quality, though not the focus of this report,²⁵ follows a five-point analytic framework that includes: i) Collections, ii) Business Strength iii) Corporate Compliance and Oversight, iv) Information Technology, and v) Customer Service. Moody's assessment of the servicer's ability to mitigate losses and maximize recoveries is an important component of the overall bond rating analysis and is used to help establish a baseline of performance expectations for a given transaction.

The actions of the servicer are an essential part of maximizing the collections on a portfolio of credit card receivables. These duties include the processing of remittances, the printing and mailing of statements, collection calls, and customer service to potentially tens of millions of credit card accounts.²⁶ Servicers employ vast numbers of collection agents, customer service representatives and other specialists. Also, servicers typically make significant investments in process and information technology, including auto-dialers, sorting machines, high-speed printers, and multi-site data warehouses that track, sort and store cardholder activity.

If the servicer's operation deteriorates to the point where the servicer is unable to fulfill its contractual responsibilities, a servicer event of default will occur. As a matter of market practice, most credit card securitizations do not have a designated backup servicer.²⁷ Therefore, from a practical perspective, the trustee is responsible for facilitating the transfer of servicing to a competent successor upon a servicer termination event. In many cases, if a successor cannot be found at the stated fee, then the trustee is required to service the accounts.

In rating credit-card-backed securities, Moody's assesses the adequacy of the servicing fee during both expected and stress cases. In the expected case, the stated servicing fee should be sufficient to attract and retain a competent servicer. In a stress case, however, the objective determination of a fair and adequate compensation becomes difficult. So far, there have been few cases where servicing was transferred while a transaction was under stress (i.e. performance-based early amortization). Even so, there is evidence that the fee stated in the operating documents (e.g. 2% of the investors' share of receivables) may be increased beyond the stated maximum rate. Hence, for cashflow modeling purposes, Moody's must consider, *ex ante*, the fair market price a third party may require as a successor servicer, even if that price is above the maximum fee stated in the underlying operating documents. For trusts comprised of subprime assets, which may require a more intensive servicing effort than their prime equivalents, that rate may reach more than double the stated 2% rate and is modeled as such by Moody's.

23 In Canada, the sales underlying most securitization including credit card ABS, are structured on a fully serviced basis. This means that as long as the original seller (or an affiliate) remains the servicer, no explicit servicing fee is paid. However, should the servicer need to be replaced, the successor is assumed to be paid the market servicing rate.

24 In some transactions, the servicing fee is subordinate to bondholder allocations prior to an early amortization event, but rises to a senior-most position if an early amortization event occurs.

25 See "[Credit Card Servicer Quality Rating Methodology](#)," Moody's Structured Finance Rating Methodology, June 29, 2004.

26 Some or all of these duties may be outsourced to a third party, but the responsibility of such obligations remains with the named servicer.

27 In Japan, all credit card trusts have operating companies designated as backup servicers at the outset of the transaction.

Structural Features

Moody's methodology for assessing the adequacy of credit enhancement levels for a given rating in credit card-backed transactions is based on an analysis of potential losses following a payout event. Payout events, which are important investor protections, generally occur when collateral performance deteriorates. Moody's cashflow analysis focuses primarily on the collateral performance-based payout events. Virtually all credit card issues have a version of the so-called "excess spread" or "base rate" trigger, which stipulates that an early amortization of the security will commence if, on a three

month rolling average basis, the total finance charges collected on the investor's share of the pool are insufficient to cover the investor's share of charge-offs, the investor's coupon, applicable servicing fees, and any other listed fees and expenses (See *Table 3* for a list of common payout events). Although payout events can provide significant credit protection, they also increase prepayment risk.²⁸ Moody's ratings do not address prepayment risk.

The most important collateral performance-based payout event in Moody's analysis is the excess spread trigger. Since the trigger is essentially a break-even calculation (that is, when income just equals expenses), it protects investors by triggering an early amortization once a transaction begins to draw on its credit enhancement. As a result, investors are able to receive principal payments before pool performance deteriorates even further and reduces their chance of an ultimate loss.

Subordination and Cash Collateral Accounts

Nearly all credit-card-backed securities issued today use a senior/subordinated ("senior/sub") structure. A few senior/sub deals also include a cash collateral account ("CCA") as a supplemental form of credit enhancement. Since card receivables are relatively liquid assets, Moody's does not in most cases make a credit distinction among the sources of enhancement (i.e. cash and subordination are fungible sources of credit enhancement). In some instances, a small component of cash enhancement may be preferred to a pure senior/sub structure, especially if there is a pronounced probability of a meaningful disruption to the normal cashflows.

The most common structure is divided into three rated tranches: Class A, B, and C that receive **Aaa**, **A2**, and **Baa2** ratings, respectively. Some newer structures include a Class M which is senior to all classes except Class **A** and receives a **Aa2** rating and a Class D that is the most junior rated tranche and receives a rating in the **Ba** range. Distributions originally allocated to the holders of more junior tranches are made available to holders of more senior tranches, if necessary to pay amounts to which the senior holders are entitled. Some senior/sub structures make only the principal payments on the junior tranche available to the senior holders, while others make both principal and interest available to the senior holders. In evaluating a senior/sub security, Moody's considers the precise nature of the protection provided for the senior and the junior holders.

Table 3

Common Payout Events

- Three-Month Average Excess Spread Is Less Than Zero;
- Bankruptcy, Insolvency Or Similar Events Relating To The Depositor;
- Inability To Transfer Receivables To The Trust As Required Under The Operating Documents;
- In The U.S., The Trust Becomes Subject To Regulation As An "Investment Company" Under The Investment Company Act Of 1940;
- Notes Are Not Paid In Full On Their Expected Principal Payment Dates;
- Occurrence Of A Servicer Default;
- Breach Of Minimum Seller's Interest;
- Occurrence Of An Event Of Default.

²⁸ Prepayment can be disadvantageous if investors are unable to reinvest at a comparable rate.

Excess Spread - An Historical Perspective

Excess spread is a proxy for the profitability of the securitized portfolio. Until recently, the U.K. excess spread margins trended higher than in the U.S., due mainly to relatively lower charge-offs. Now, due to rising charge-off rates, the U.K. excess spread margin has narrowed. Meanwhile, the excess spread in the U.S. is unusually high as the lingering effects of a 2005 change in the bankruptcy laws persist.

Over the past fifteen years, excess spread in the U.S. has risen. Given the variable and dynamic nature of the main performance measures that comprise the excess spread (yield, coupon, and charge-offs), it is difficult to point to a single explanation for the general increase in the excess spread margin. Even so, over this period of time the yield has generally been falling and the charge-off rate has been rising, both of which result in a lower excess spread margin, then the general rise in excess spread must be explained by a falling coupon rate (i.e. cost of funds, see *Chart 12*, below). Since most securitized deals have a variable rate coupon, the transactions' cost of funds moves with changes in short-term interest rates. Interestingly, the most recent rise in short term rates, which began in 2004, has not resulted in a compression of the excess spread margin due to a falling charge-off rate and somewhat higher yield over this period of time.

Chart 11
Excess Spread

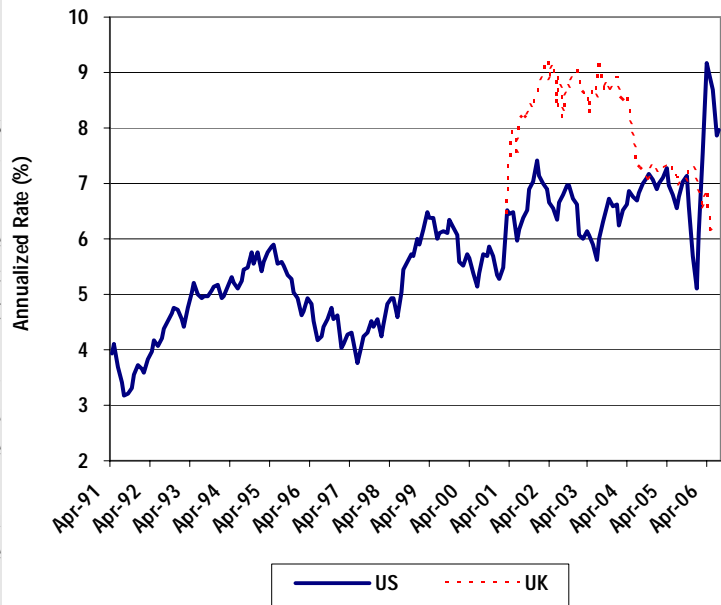
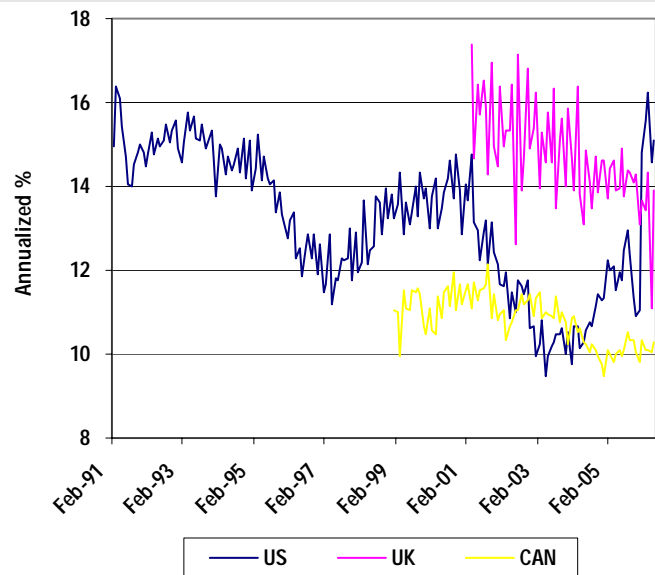


Chart 12
Imputed Funding Cost



Source: Moody's Investors Service Credit Card Indices
Note: Imputed Funding Cost = Yield less Charge-offs less Excess Spread less Servicing Fee

Chart 13
Net Yield (Yield less Charge-offs)



In Canada, the index is calculated using managed (rather than just securitized) portfolio performance data. Due to the unavailability of a bond coupon component for the receivables held on book, excess spread for this market is not calculable. As an alternative to this measure, the net yield (yield less charge-offs) is used as a basis of comparison (see *Chart 13*).

Credit enhancement is typically expressed in one of two ways. For traditional senior/sub deals, the level of subordination is expressed as a percentage of the entire series. For example, a credit card issue with 11% subordination has total subordinated classes equaling 11% of the total issuance amount of the series and a senior class that is 89% of the total issue size.

For deals issued from de-linked trusts, subordination for each tranche of notes is expressed as a percentage of the adjusted outstanding principal balance of such tranche,²⁹ rather than as a percentage of the total invested amount. For example, in the Capital One Multi-asset Execution Trust ("COMET"), the Class A notes currently require 20.4820% of subordination, calculated as a percentage of the Class A note. This is mathematically equivalent to a 17.0% subordination requirement as calculated as a percentage of the total invested amount. In either case, the actual level of losses investors are protected from are equivalent.

Credit for Excess Spread

Excess spread is simply defined as the income collections remaining after all transaction expenses have been paid. Typical transaction expenses are the investor's coupon, charge-offs, and fees. Excess spread provides a cushion against portfolio deterioration and, as such, is a form of credit protection. It is also a good proxy for the overall health of a master trust.

Under expected performance scenarios, excess spread is paid to the issuer. In declining spread scenarios, spread can be captured to provide an additional measure of protection.

Typically, the spread account is initially unfunded, but is anticipated to fund if excess spread falls below prescribed levels (see *Table 4* for an example of spread capture triggers). As the account balance builds, it provides additional credit support although usually only for the **Baa** and/or lower rated classes. Moody's assumes limited benefit for this type of spread account for classes rated **A** and above. For lower-rated securities, though, the stresses are less severe and some benefit for the potential cash captured is given in the analysis.

(A) if the three-month rolling average excess spread is greater than or equal to...	(B) ...and less than...	(C) ...the required spread account percentage equals:
4.50%	---	0.00%
4.00%	4.50%	1.00%
3.50%	4.00%	2.00%
3.00%	3.50%	2.50%
2.50%	3.00%	3.00%
0.00%	2.50%	4.00%
---	0.00%	13.50%

In order to calculate the likely value of the spread account, Moody's uses a multi-scenario approach to model future spread capture. Each randomly generated scenario creates a discrete path of excess spread based on, in part, the historical volatility (level of month to month changes) of excess spread in the subject trust. Assumed volatility, along with the specific deal's capture triggers, are the main determinants of the value of spread capture. The greater the historical volatility the more likely spread is expected to decline at a more rapid rate and therefore limit the value of the triggers. Similarly, the higher the level at which excess spread capture begins, and the more captured at each tier, the higher the value ascribed to the spread account. Historically, enhancement credit for this form of trigger has ranged from approximately 1.00% to 3.25%.

Assuming the spread capture triggers listed in column A, *Table 4*, above, as the base case, sensitivity to both capture levels and assumed volatility in excess spread are given below, *Table 5*.

²⁹ For purposes of calculating required subordination levels, amounts held in the principal funding account are deducted from the outstanding principal balance.

Table 5

**Potential Spread Capture Credit
Spread Capture Levels vs. Assumed Excess Spread Volatility**

Capture Levels	Assumed Excess Spread Volatility				
	0.5%	1.0%	1.5%	2.0%	2.5%
Base Case	3.0	2.0	1.4	1.1	0.9
Base Case + 0.5%	3.4	2.4	1.8	1.3	1.1
Base Case + 1.0%	3.7	2.9	2.1	2.0	1.4

Note: Increments to Base Case apply to each trigger level in columns A and B, Table 3.

Dilution Coverage And The Role Of The Seller's Interest Percentage

The seller interest percentage provides important protection for investors in revolving credit card securitizations: it absorbs periodic fluctuations in receivables balances to ensure that there are enough receivables at all times backing securities held by investors. The critical role of the seller interest suggests that the size of the seller piece should be adequate to provide both issuers and investors with a cushion against several non-credit-related transaction risks.

Fluctuations in receivables can be caused by merchandise returns, by breaches of representations and warranties by the seller that may cause certain receivables to become ineligible, or simply by seasonal swings in credit card balances. Typically, there is a "minimum seller's interest" required to insulate investors from receivables balance fluctuations. Failure to maintain this minimum can have severe consequences for credit-card-backed securities, including an immediate early amortization event. In order to avoid the administrative costs relating to the addition of receivables to a trust on short notice, issuers often maintain their seller's interest at a level above the minimum required.

Issuers must fund the seller interest on-balance-sheet; therefore, they often attempt to reduce the seller percentage to the lowest possible level in order to lower their funding costs. Thus, the challenge for issuers is to establish a minimum seller interest that maintains a steady balance between potential fluctuations over the life of a master trust and the economics of their funding needs.

The seller piece should provide issuers and investors with a cushion against the related transaction risks. Moody's considers many factors, including historical dilution rates, seasonal fluctuations in pool balance, the ability of the issuer to stand behind its representations and warranties, the size of issuer, and the issuer target market, in its rating process. The interaction of these various factors impacts the optimal sizing of the seller piece for each credit card securitization

Rating Subordinate Notes

Moody's ratings are based on an expected loss approach, which takes into consideration the probability and severity of default as well as the timing of the expected cash flows; these factors are combined into a single measure by determining an expected change in the internal rate of return on the security due to credit losses. A subordinated security may have a relatively low probability of default, but a high potential severity since the subordinated security, which generally comprises only a small portion of the total pool, will be allocated all losses on the entire pool once its enhancement is exhausted. In general, the smaller the subordinated tranche relative to the senior tranche, the greater the potential severity

Cashflow Allocations

Cashflow allocation mechanics have become relatively standardized in the credit card sector.³⁰ Principal and finance charge collections are bifurcated and then divided between the investors and seller. During the revolving period, principal collections are reinvested in receivables arising in the accounts selected, or "flagged", for the trust. During the amortization period, allocable principal collections are used to repay investors in order of class seniority. Finance charge collections are used to pay deal expenses.

30 For a discussion of the credit implications of various cashflow allocation methodologies in credit card transactions, please see "[Credit Card Master Trusts: Assessing the Risks of Cash Flow Allocations.](#)" May 26, 1995. In general, the various allocation methods used in credit card master trusts to date have not materially affected Moody's assessment of the credit quality. That is because each allocation method, typically, has offsetting positives and negatives associated with it - in some future scenarios, one type of allocation may provide investors with more protection, while in other scenarios, that allocation method may provide investors with less protection.

A defining feature of credit card cashflow allocations is the fixed allocation of principal collections. Simply put, this feature locks in the numerator to the level of the principal allocation percentage at the beginning of a payout event, and the denominator is defined as the aggregate principal receivables in the trust.³¹ This is a potentially powerful structural feature because, as the deal amortizes, investors will receive an allocation of principal collections based on a fixed portion of the portfolio even as their economic interest decreases as the deal amortizes. This has the effect, at the expense of the seller, of accelerating the repayment of principal and decreasing investors' exposure to credit losses.

The value of this feature depends on assumptions affecting the balance of the trust from which collections are allocated - especially the charge-off rate and purchase rate assumptions (see *Table 9* and *Table 11* for a sensitivity analysis).^{32, 33}

Unlike principal allocations, finance charge collections are typically allocated to each series on a *pro rata* basis.³⁴ That is, the numerator of the finance charge allocation percentage for investors follows the invested amount as the deal pays down. Therefore, the deal gets only a proportional allocation of finance charge income to cover deal expenses, which are also allocated on a *pro rata* basis.

However, some trusts do employ a fixed finance charge allocation structure. Under this method, as principal on the investor certificates is paid down during an early amortization period, noteholders continue to be allocated a percentage of the finance charge collections on each payment date based on the certificate principal amount prior to the commencement of the early amortization period. The result is an "over-collateralization" of finance charge collections, which may be applied to make up shortfalls in amounts due to noteholders.

Moody's has historically given a significant benefit to the credit enhancement due to the inclusion of this feature. However, the benefit that this feature accrues is predicated on the assumption that the underlying card program is viable and/or is supported by a highly rated entity. For example, in a scenario in which card utility is lost and cardholders can no longer make purchases, the fixed allocation feature would no longer provide any incremental benefit.

CONCLUSION

Over the past fifteen-plus years, the credit card ABS sector has weathered, among other things, two recessions, a dramatic rise in bankruptcy-related losses, and numerous regulatory changes. Rapid organic growth in the mid-1990s gave way to massive consolidation as issuers sought scale. Technology, too, has played a role as underwriting, risk management and collection tools have become more precise and effective in parsing risk. Also over this period of time, significant credit card product innovations have been made. These include a plethora of card terms, balance transfer and teaser rate offerings, co-brand and affinity partnerships, and rewards programs. As a result, card usage has evolved and more and more cardholders are using their credit cards as a substitute for cash.

From a structural perspective, the industry has also evolved from discrete, stand-alone trusts, to master trusts, and now to de-linked note trusts. De-linked trusts are particularly nimble issuance vehicles because they allow for more timely, investor-tailored issuance compared to traditional, master trusts.

Moody's methodology for rating these transactions has been flexible enough to respond and adapt to these changes in the marketplace while delivering consistent, timely credit ratings. Historical annual upgrade and downgrade rates for the credit card sector have been among the lowest compared to the other ABS major asset types.³⁵ As the industry evolves further, Moody's will continue to respond and update this approach.

31 In certain circumstances, principal allocations in the U.K. are capped at prescribed "regulated amounts", which are typically 1/12th or 1/18th of the initially invested amount. No such convention exists in the U.S. or Canada.

32 Please see the *Charge-off Rate* and *Purchase Rate* sections, above, for a more detailed discussion of the factors Moody's considers when modeling these assumptions.

33 Japanese transactions have historically allowed for the removal of receivables in excess of the minimum seller interests, thereby greatly diminishing the fixed allocation feature and its sensitivity to the purchase rate assumption.

34 Discover and Metris master trusts include a fixed finance charge allocation feature.

35 Please see "Structured Finance Rating Transitions: 1983 - 2005", February 2006.

APPENDIX A

Modeling Cashflows - An Early Amortization Scenario

The following tables illustrate a discrete stress scenario of a generic \$500 million credit card transaction. *Table 6* depicts the key assumptions during the amortization period, while *Table 7* details the cash flow allocations to bondholders. *Tables 8 - 11* provide sensitivity analyses of key model assumptions.

In *Table 6*, the payment rate and yield are immediately stressed from an expected "run rate" of 18% and 20%, respectively, to a floor rate of 5.5% and 11.5%, respectively. These stressed, floor rates are maintained for the duration of the assumed early amortization period. Similarly, the assumed fixed coupon rate and servicing fee for this security are maintained at 8% and 2%, respectively.

The charge-off rate is initially stressed to 17% (twice the expected "run rate" of 8.5%), then increased by one percentage point each month until reaching 34% (quadruple the expected "run rate"). The purchase rate is derivative of a "constant" pool assumption, which means that a sufficient amount of purchases are assumed to maintain the trust balance throughout the duration of the early amortization period.

The spread percentage is equal to the yield less the coupon rate, servicing fee and charge-off rate. The seller percentage increases as the invested notes are paid down.

Table 7 tracks the allocation of cashflows and deal expenses through the amortization period using the assumptions listed below. Upon the commencement of early amortization, the \$500,000,000 invested amount of the bond represents 96% of the total trust size; therefore, throughout the amortization of the bond, the allocation of principal receivables remains a constant 96%, or \$26,500,000 per month. Finance charge, charge-offs, servicing and coupon interest are allocated on a pro rata basis, so their allocation percentage falls each month as the investor interest decreases. Since this example depicts a "constant" pool assumption, the "New Purchases" column measures the amount of new purchases required to maintain the pool at \$520,833,333 throughout the amortization period.

The "shortfall" column measures the deficiency of finance charge allocations to meet the deal expenses (charge-offs, servicing and investor coupon) for each month. Finally, the end-of-period ("EOP") column tracks the note's remaining investor interest after deducting principal payments and write-downs due to charge-offs.

The aggregate "shortfall" amount (\$67,524,988) is the required level of **Aaa** credit enhancement and is typically expressed as a percentage of the original principal balance of the notes, in this case 13.5% ($\$67,524,988 / \$500,000,000$).

Assumptions:

- Investor's share of the pool at the end of revolving period is 96%
- Total pool balance remains constant
- Investor coupon is fixed at 8.0%
- Annual servicing fee is 2.0%
- Total shortfalls to investors as % of original principal = 13.5% ($67,524,988/500,000,000$)
- **Aaa** credit enhancement = 13.5%

Table 6
Generic Assumptions For Key Variables During Early Amortization

period	purchase rate	principal payment rate	charge-off rate	yield	coupon	servicing	spread	seller percentage
1	6.9%	5.5%	17.0%	11.5%	8.0%	2.0%	-15.5%	4.0%
2	7.0%	5.5%	18.0%	11.5%	8.0%	2.0%	-16.5%	10.6%
3	7.1%	5.5%	19.0%	11.5%	8.0%	2.0%	-17.5%	17.3%
4	7.2%	5.5%	20.0%	11.5%	8.0%	2.0%	-18.5%	23.9%
5	7.3%	5.5%	21.0%	11.5%	8.0%	2.0%	-19.5%	30.4%
6	7.3%	5.5%	22.0%	11.5%	8.0%	2.0%	-20.5%	36.9%
7	7.4%	5.5%	23.0%	11.5%	8.0%	2.0%	-21.5%	43.3%
8	7.5%	5.5%	24.0%	11.5%	8.0%	2.0%	-22.5%	49.7%
9	7.6%	5.5%	25.0%	11.5%	8.0%	2.0%	-23.5%	56.0%
10	7.7%	5.5%	26.0%	11.5%	8.0%	2.0%	-24.5%	62.2%
11	7.8%	5.5%	27.0%	11.5%	8.0%	2.0%	-25.5%	68.3%
12	7.8%	5.5%	28.0%	11.5%	8.0%	2.0%	-26.5%	74.3%
13	7.9%	5.5%	29.0%	11.5%	8.0%	2.0%	-27.5%	80.2%
14	8.0%	5.5%	30.0%	11.5%	8.0%	2.0%	-28.5%	85.9%
15	8.1%	5.5%	31.0%	11.5%	8.0%	2.0%	-29.5%	91.5%
16	8.2%	5.5%	32.0%	11.5%	8.0%	2.0%	-30.5%	97.0%
17	8.3%	5.5%	33.0%	11.5%	8.0%	2.0%	-31.5%	100.0%

Table 7

SAMPLE CASHFLOWS - EARLY AMORTIZATION SCENARIO

ALLOCATIONS AND DISTRIBUTIONS TO INVESTORS

PERIOD	TOTAL TRUST RECEIVABLES	BOP INVESTOR PRINCIPAL	ALLOCATIONS		DISTRIBUTIONS						EOP INVESTOR PRINCIPAL	NEW PURCHASES
			FINANCE-CHARGES	PRINCIPAL	PRINCIPAL	FINANCE CHARGES	CHARGE-OFFS	SERVICING	INTEREST	SHORTFALL		
1	520,833,333	500,000,000	96%	96%	27,500,000	4,791,667	7,083,333	833,333	3,333,333	(6,458,333)	465,416,667	36,024,306
2	520,833,333	465,416,667	89%	96%	27,500,000	4,460,243	6,981,250	775,694	3,102,778	(6,399,479)	430,935,417	36,458,333
3	520,833,333	430,935,417	83%	96%	27,500,000	4,129,798	6,823,144	718,226	2,872,903	(6,284,475)	396,612,273	36,892,361
4	520,833,333	396,612,273	76%	96%	27,500,000	3,800,868	6,610,205	661,020	2,644,082	(6,114,439)	362,502,068	37,326,389
5	520,833,333	362,502,068	70%	96%	27,500,000	3,473,978	6,343,786	604,170	2,416,680	(5,890,659)	328,658,282	37,760,417
6	520,833,333	328,658,282	63%	96%	27,500,000	3,149,642	6,025,402	547,764	2,191,055	(5,614,579)	295,132,880	38,194,444
7	520,833,333	295,132,880	57%	96%	27,500,000	2,828,357	5,656,714	491,888	1,967,553	(5,287,797)	261,976,166	38,628,472
8	520,833,333	261,976,166	50%	96%	27,500,000	2,510,605	5,239,523	436,627	1,746,508	(4,912,053)	229,236,643	39,062,500
9	520,833,333	229,236,643	44%	96%	27,500,000	2,196,851	4,775,763	382,061	1,528,244	(4,489,218)	196,960,880	39,496,528
10	520,833,333	196,960,880	38%	96%	27,500,000	1,887,542	4,267,486	328,268	1,313,073	(4,021,285)	165,193,394	39,930,556
11	520,833,333	165,193,394	32%	96%	27,500,000	1,583,103	3,716,851	275,322	1,101,289	(3,510,360)	133,976,543	40,364,583
12	520,833,333	133,976,543	26%	96%	27,500,000	1,283,942	3,126,119	223,294	893,177	(2,958,649)	103,350,423	40,798,611
13	520,833,333	103,350,423	20%	96%	27,500,000	990,442	2,497,635	172,251	689,003	(2,368,447)	73,352,788	41,232,639
14	520,833,333	73,352,788	14%	96%	27,500,000	702,964	1,833,820	122,255	489,019	(1,742,129)	44,018,968	41,666,667
15	520,833,333	44,018,968	8%	96%	27,500,000	421,848	1,137,157	73,365	293,460	(1,082,133)	15,381,812	42,100,694
16	520,833,333	15,381,812	3%	96%	27,500,000	147,409	410,182	25,636	102,545	(390,954)	0	42,534,722
17	520,833,333	0	0%	96%	15,381,812	0	0	0	0	0	0	42,968,750

Assumptions:

Investor's share of the pool at the end of revolving period is 96%

Total pool balance remains constant

Investor coupon is fixed at 8.0%

Annual servicing fee is 2.0%

Total shortfalls to investors as % of original principal = 13.5% (67,524,988/500,000,000)

Aaa credit enhancement = 13.5%

Sensitivity Analysis

The tables below demonstrate the relationship of various model inputs to the output, credit enhancement (i.e. cumulative losses ascribed to noteholders). The circled figures are those assumed in the base case depicted in *Tables 6 and 7*, above.

Table 8
Credit Enhancement (CE) vs. Stressed Yield Assumptions

Stressed Yield							
	10.0%	10.5%	11.0%	11.5%	12.0%	12.5%	13.0%
CE	14.5%	14.2%	13.8%	13.5%	13.2%	12.8%	12.5%

Note: The relationship between yield and CE is linear, holding all other variables constant. In this example, every point of change in the yield assumption affects the CE by approximately 0.67%.

Table 9
Credit Enhancement (CE) vs. Charge-off Rate Assumptions

Stressed Charge-off Rate							
	5.5%	6.5%	7.5%	8.5%	9.5%	10.5%	11.5%
CE	10.0%	11.3%	12.4%	13.5%	14.6%	15.6%	16.6%

Note: For purposes of this illustration, the "expected" charge-off rate shown is doubled, and then doubled again over time. See Modeling Cashflows - An Early Amortization Scenario, below, for underlying assumptions of other key variables.

Table 10
Credit Enhancement (CE) vs. Principal Payment Rate Assumptions

Stressed Principal Payment Rate							
	4.0%	4.5%	5.0%	5.5%	6.0%	6.5%	7.0%
CE	18.2%	16.3%	14.8%	13.5%	12.4%	11.5%	10.7%

Note: See Modeling Cashflows - An Early Amortization Scenario, below, for underlying assumptions of other key variables.

Table 11
Credit Enhancement (CE) vs. Stressed Purchase Rate Assumptions

Stressed Purchase Rate					
	1.0%	0.75%	0.50%	0.25%	0.00%
CE	13.5%	14.9%	16.9%	19.9%	26.9%

Note: The purchase rate is expressed as a "pool factor" that ranges between 1.0 and zero. At 1.0, the purchase rate is assumed to be sufficient to maintain the trust size at a constant level (i.e. purchases are equivalent to decreases to the trust due to losses and payments). At zero, no new purchases are assumed, losses and payments shrink the trust unabated, and, as a result, allocations to investors become proportionately smaller.

APPENDIX B

Percentage of Trust Accounts Making Minimum Payment or Full Payment^a

Master Trust	Advanta ^b	AMEX - Credit Card	BAC (formerly MBNA)	Capital One	Chase - CHAIT	Chase - CHAMT	Chase - FUSA	Citibank - CCCIT	Discover	HSBC - HCCMNT	National City
As of	Sep-06	Jun-06	Sep-06	Sep-06	Mar-06	Jun-06	Jun-06	Jun-06	Jun-06	Jun-06	Jan-06
% of Accounts Making Min. Payment ^c	5%	4%	3%	9%	4%	4%	3%	4%	4%	N/A	5%
% of Accounts Making Full Payment ^c	15%	18%	10%	13%	20%	19%	19%	20%	14%	N/A	15%
% Accounts with No Payment Due	43%	62%	60%	25%	42%	52%	56%	51%	63%	N/A	42%
% of Accounts Making Min. Payment (excl. Accounts with No Payment Due)	9%	10%	9%	11%	7%	8%	7%	7%	11%	11%	9%
% of Accounts Making Full Payment (excl. Accounts with No Payment Due)	27%	48%	25%	18%	35%	39%	43%	42%	39%	24%	25%

Notes:

a. Metrics in **bold** are reported, metrics in *italics* are derived.

b. Based on "relationships" rather than accounts. The payment metrics reported in prospectus exclude zero balance relationships but include credit balance relationships. The payment metrics in the table are therefore all adjusted metrics for comparison with other issuers.

c. This metric is calculated based on all accounts in the trust, including those that have a credit balance or zero balance and therefore do not have a payment due.

Sources:

Prospectus Supplements and Static Pool websites

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