

Structured Finance

Trade Receivable Criteria

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The Rating Process For Trade Receivables

In an age of continuous innovation and creativity, attempts are constantly being made to securitize almost anything that generates cash flow. In order to provide sellers of these securities with the ability to tap diverse funding sources and to enable investors to conduct their activities with greater confidence, a rating is assigned. As a result, ratings play an important role in the structured finance market.

The process for rating securities backed by trade receivables begins when a banker or seller contacts Standard & Poor's to request a rating. A conference call or brief meeting is then arranged so that an overview of the selling proposal can be presented. This type of presentation may include information about the seller or a draft of transaction documents. If no impediments to the transaction are apparent, a review will be performed.

Review

Rating analysts perform an on-site review for each trade receivable transaction. Ideally, a preliminary information memorandum outlining the proposed transaction, the seller, the seller's business and industry, and portfolio information will be prepared prior to the on-site visit (*see box*). Each visit may address:

- The seller's business, including financial performance, organizational structure, background, history, and recent significant developments;
- The seller's competition, including market share statistics and prospects for the future;
- Credit and collection policies, including an overview of the credit department, experience of credit personnel, procedures for granting new credit, aging policy, special programs, return policies, collection procedures, and write-off policies;
- Management of the portfolio;
- Receivable and invoice generation, including a detailed explanation of the billing cycle and the interaction with the receivable system (supported by documentation

including standard agreements, standard bills of lading, purchase orders, and sales invoices);

- Receivables reserves and bad-debt write-offs;
- Dilution review, including a detailed description of the causes of dilution and any reserves established for dilution (supported by appropriate documentation);
- Dilution horizon analysis in both an anecdotal and statistical manner;
- Cash management;
- Concentrations and management of concentrations;
- Receivable performance statistics;
- Receivables systems;
- Disaster-recovery procedures; and
- Proposed changes to the systems.

This list serves only as a core list of topics to be discussed. Depending on the information presented, the scope of the review may be broadened to cover additional items, or the scope may be narrowed and focus in greater detail on several particular items.

In addition to reviewing information provided by the seller or banker, the Structured Finance Ratings analyst will consult with the Corporate Ratings analyst responsible

Data Requirements

The following core information is requested when a transaction is submitted for rating. Note that depending on the characteristics of the transaction, additional information may be required.

- Monthly receivable balances (excluding credit memos) for the last three years;
- Monthly sales figures for the last three years;
- Monthly delinquency statistics for the last three years with an explanation of the aging process (aged from the invoice date or the due date) as well as any reconciliation of the receivables aging to the general ledger;
- A summary of payment terms offered and an historical analysis of the percentage of the receivables pool subject to a particular payment term, including weighted average payment terms figures if receivables are aged on a past due rather than a past invoice basis;
- Monthly dilution figures for the last three years;
- A summary of the items giving rise to dilution and an explanation of each of the items;
- Sample of credit memos aged back to the invoice date, including the reason for the dilution and the dollar amount of the dilution;
- Historical portfolio turnover (day's sales outstanding) variance analysis;
- A breakdown of the top customer concentrations and their related ratings, if any; and
- Audited financial statements and annual reports.

If this information is not available, analysts will work with available data and make conservative assumptions where gaps in information exist. In some cases, this may lead to artificially high credit support levels until adequate data is available.

for the seller or for the seller's industry if the seller is not rated. The corporate analyst may be able to provide additional insight into the seller's business practices and the risks associated with the accounts receivable pool including the impact of a seller bankruptcy on receivable performance.

Legal And Structural Analysis

The rating of structured financings is based primarily on the creditworthiness of isolated assets or asset pools, whether sold or pledged to secure debt, and without regard to the creditworthiness of the seller or borrower. The structured financing seeks to insulate transactions from entities, such as receivables sellers, that are either low rated or unrated. A worst-case scenario assumes the bankruptcy of each transaction participant that is not a bankruptcy-remote entity and that is rated lower than the transaction.

As is common to most securitizations, in which the receivables are originated by an entity subject to the bankruptcy code, the seller will transfer its trade receivables to a special-purpose entity (SPE). The SPE will then transfer or pledge the assets to a trust that will issue the rated securities. The SPE, generally a subsidiary of the seller, must satisfy bankruptcy-remote criteria. The articles of incorporation and bylaws will be reviewed to determine the bankruptcy-remote status of the SPE. As in other asset-backed transactions, in rating trade receivable-backed securities higher than the rating of the issuer, seller, or borrower, the analyst seeks assurance that the following legal considerations are satisfied:

- The owner of the assets is a bankruptcy-remote entity, also referred to as an SPE;
- Transfers of assets to the SPE are "true sales;" and
- The trustee for the security holders has a first priority perfected security interest in the assets.

In addition, certain additional legal criteria may apply as a result of the nature of trade receivables or the structure of the transaction.

Depending on the legal issues, the analyst may request opinions of counsel to address these legal concerns. In broad terms, among the legal opinions that may be requested are:

- **Nonconsolidation.** If the bankruptcy-remote entity is wholly owned by a parent that is not bankruptcy remote, an opinion to the effect that in an insolvency of the parent, the assets and liabilities of the SPE would not be substantively consolidated with those of the parent under applicable insolvency laws. Similarly, if the bankruptcy-remote entity is a limited partnership or a limited liability company, an opinion to the effect that the entity would not be consolidated with a bankrupt partner or member.

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- *True sale.* An opinion to the effect that transfers of receivables by entities that are not bankruptcy-remote would be viewed as true sales and, therefore, not be viewed as property of the bankruptcy estate of the transfer or under Section 541 of the Bankruptcy Code, or be subject to the automatic stay under Section 362 of the Bankruptcy Code. Furthermore, an opinion may be required to the effect that the assets transferred and the related debt service payments to the security holders would not be recoverable as preference payments or be deemed a fraudulent conveyance.
 - *Perfection.* An opinion to the effect that the trustee has a first priority perfected security interest in the receivables and other property pledged to secure the rated issue.
 - *Tax status.* An opinion to the effect that the trust will not be treated as an association taxable as a corporation.

Rating Committees And Surveillance

Information from the business review as well as legal research, credit analysis, and structural analysis will be compiled into a committee presentation. Once the rating committee meets to review the presentation and make its decision, the results will be conveyed to the banker. If the decision is positive, a rating letter will be issued upon closing and the satisfaction of all committee issues.

Once the transaction has been rated, the seller will submit monthly surveillance reports containing prespecified information. The Structured Finance Asset-Backed Surveillance Group maintains surveillance on all rated transactions. The purpose of surveillance is to ensure that the rating continues to reflect the ongoing performance and structure of the transaction. Performance information is usually disclosed in a servicing report that is prepared by the servicer assigned to the transaction.

Prior to the closing of a transaction, analysts will review the form of servicer reporting to assure that all necessary information has been included. For most trade receivables transactions a monthly report is required by surveillance, however in some instances surveillance may also require daily reports. A contact name and telephone number of the party preparing the surveillance reports should be provided to the analysts by the servicer or trustee. Accompanying the final servicing report provided for the transaction, a notice should be attached verifying the final payment to investors and the date that this payment was made.

Analysts must be informed of any changes concerning the original structure of the transaction, including management, credit policy, system changes, or any change in status of the initial parties involved with the transaction. All information will be used as part of normal surveillance maintenance for the transaction. If there is a rating change during the course of the transaction, the seller and the trustee will be notified.

Lockbox Account Structure

While it is preferable for collections on receivables in securitized transactions to flow to trustee-controlled lockboxes, this practice cannot be followed in health care securitizations. A health care securitization must comply with Medicare's and Medicaid's anti-assignment provision. This provision requires that all governmental payments for services furnished by a provider be made directly to the provider (or to a separate provider-controlled lockbox account), except for payments made to a government agency or under a court order or to a billing agent. The provider's bank should have standing instructions to sweep the account into a transaction's collection account, which is controlled by the trustee and is in the name of the transaction.

Compliance with the anti-assignment provision entails some potential commingling of provider monies with collections on sold receivables. Commingling in the account of the seller results in a potential ultimate loss risk of the funds held in that account on the date the seller files for bankruptcy. Accordingly, the analyst seeks to ensure that commingling at the provider is as brief as possible, at most 48 hours, and additional credit enhancement is sized to cover this bankruptcy-related risk.

Evaluating Trade Receivable Credit-Related Risks

This section outlines the methodology for analyzing the credit-related risks in a trade receivables transaction. The primary risk associated with most asset types is the risk of obligor delinquency and default. In addition, trade receivables are subject to the risk of dilution, which is a noncash reduction in the receivable balance for reasons other than default. Commingling of cash is another concern in all asset-backed financings. However, the risk of loss of funds held by the seller-servicer at the time of bankruptcy is heightened by the rapid payment rates associated with trade receivables. Carrying costs and servicing issues also are of concern and are reviewed in this section.

Obligor Default Risk

A similar methodology to analyzing obligor default risk is applied in all asset-backed financings, starting with a review of portfolio performance. There are a number of unique issues associated with this asset type, and performance characteristics can vary widely across different industries, as well as across different companies within the same industry.

Historic delinquency and write-off performance generally is the best indicator of portfolio credit quality. Most companies carry delinquent trade receivables far longer than a bank or finance company would before writing them off. This can be viewed as a positive because accounts are worked until collection opportunities are exhausted. However, if charge-off policies are discretionary and subject to manipulation, it is difficult to determine the value of delinquent receivables. For this reason, the trade receivable criteria focuses on analyzing late-stage delinquencies as credit quality indicators. Typically, a bankruptcy of the seller is assumed along with the resulting difficulty in collecting severely delinquent accounts.

After a careful review of performance, analysts will visit the seller-servicer to investigate the driving forces behind delinquency behavior. These forces may be product-related, industry practices, and/or obligor specific. The relationship

between the seller and the customer often is critical in assessing receivable performance, as the two depend on each other for continued success. If the obligor defaults, the business relationship will cease and the customer's relationship with other suppliers will be adversely affected. In the investigative process, underwriting and collection policies and procedures, customer demographics, marketing strategies, terms offered to customers, the nature of competition, and industry-specific factors that could impact receivable behavior are discussed.

The relationship between marketing and the credit approval process also will affect credit quality. As with private-label credit cards, the marketing and underwriting areas have conflicting objectives. Companies lend to their customers to facilitate the sale of merchandise. It is important to remember that the accounts receivable department is not a profit center, and its goal is usually to maximize sales while minimizing delinquencies and write-offs. A review of portfolio performance and management can provide significant comfort, but portfolios are dynamic, and management philosophies are subject to change.

There are a number of possible risks to a portfolio if the supplier experiences a difficult business period. During such times, a supplier may sacrifice receivable credit quality to achieve other business objectives. Product quality and portfolio servicing also could suffer. In the event of a supplier's bankruptcy, the customer's incentive to pay its obligations could diminish. Dilutions could increase if product quality deteriorates or the value of future services and warranties is questionable. Payment patterns can change if the supplier extends payment terms to gain an advantage over or meet the terms offered by a competitor. There also is the risk that characteristics of the customer base may change significantly. This could happen if the supplier expands its business into new geographic regions or new business lines. In dealing with these variables, analysts in the Structured Finance Ratings group discuss each transaction with the appropriate industry expert in the Corporate Ratings group to better understand how the dynamics of the industry and the position of the relevant company could affect receivable performance.

Although the impact of a bankruptcy of the seller-servicer is a major consideration in analyzing a trade receivable pool, seller-servicer credit quality is not a major factor in the rating process. The analyst generally takes a weak-link approach and assumes that the seller-servicer, if not rated as high as the securitized issue, will, for purposes of the structured analysis, enter bankruptcy. Notwithstanding the bankruptcy of the seller-servicer, the structured issue should survive. In cases in which the rating assigned to a structured issue is directly dependent on the credit quality of the seller-servicer, rating letters and published articles will disclose this approach.

How, then, is a revolving pool with a credit risk profile that is subject to change analyzed? There are two alternatives. An obvious one would be to size credit support on the basis of performance triggers. For example, if receivables 61-90 days past due

exceed a specified percent, stop reinvestment and liquidate the transaction. However, this alternative often is undesirable because a liquidation event would subject both the seller and investor to unwanted prepayment risk. The second alternative, and the one adopted by most sellers, is to cover the risks associated with a dynamic portfolio with dynamic credit support. There is a framework for rating transactions that use dynamic credit enhancement. The credit support analysis is driven by performance-based formulas tailored to fit the portfolio's specific risk profile.

The formulas used to analyze credit support consist of three key variables:

- Loss horizon,
- Credit quality indicator, and
- Stress factor.

The loss horizon is the expected time period over which losses would be incurred. The credit quality indicator is the performance-based factor, and the stress factor reflects the evaluation of risk, which is based on portfolio characteristics. Though actual stress levels may vary with each portfolio, benchmarks have been established to provide guidance to market participants.

Obligor concentrations are present in most portfolios. It is not uncommon to see a portfolio with the top five customers representing 20% of sales. Portfolio credit analysis can be actuarial, obligor specific, or both. In the case of trade receivables, the combined approach is taken. Analysis of dynamic support is conducted with an actuarial approach, as well as by requiring that credit support floors be in place to cover exposure to large obligors. Such floors are based on obligor concentrations and credit ratings. Since the composition of a pool can change over time, concentration limits must be specified. To the extent an obligor exceeds its specified limit for a transaction, the excess balance should become ineligible for borrowing base calculations.

Dilution Risk

The term dilution is used broadly to refer to any non-cash reduction to a receivable balance that is not attributable to default or write-off. Product returns, cash discounts, advertising allowances, volume rebates, good customer programs, and standard pricing disputes are all examples of dilution. The payment of a check rather than the issuance of a credit memo may resolve certain dilutive items, such as volume rebates. Therefore, in order to ensure proper measurement of dilution, checks issued on account of dilutive items must be measured as well as dilutive credit memos. Also, dilution encompasses items that may not be taken as an adjustment in the normal course of business, but nonetheless represent a potential future offset. For example, a contra-account (that is, an account payable to and account receivable with the same payee-payor) would, in most instances, not manifest itself as a dilution until the seller becomes bankrupt.

Upon bankruptcy, an obligor may decide to net its payable position against its receivable position when making payment on the receivables to the seller, thus reducing the expected cash flow from receivables.

Companies must grant dilutive credits to remain competitive. The level of dilution is driven by factors such as industry practice and product complexity. The largest category of dilution is often the return of merchandise, but there are many others. Companies often use dilutions in the form of volume rebates to encourage additional sales. Advertising allowances are credits to customers for including company brands in store advertisements. Dilutions are almost always used to encourage prompt payment (for example, 2% discount if payment is received within 10 days of invoice). Other items may include disputes over price or quality, short shipments, or billing errors.

When analyzing dilutive credits, if possible, dilutive items are categorized as either contractual or variable. Contractual items are those that can be easily quantified by assuming that all obligors take advantage of the contract. For example, the obligors meet volume rebate targets and take full advantage of early payment discounts. All other dilution risks must be quantified by stressing historic performance. As with obligor default risk, dilution risk can be significantly affected by a change in company philosophy or industry practice. Here too, dynamic credit supports often work best in that they can be adjusted for changes in actual performance. As with credit supports, dilution coverage is derived on the basis of performance, dilution horizon, and portfolio-specific stress factors. To understand the effects of dilution, the dilution horizon concept has been used to describe the time period between a sale and the recognition of a dilutive credit.

Obviously, different types of dilution have different horizons. Cash discounts are clearly predictable on the basis of the terms offered. A defective product dispute, on the other hand, may take months to resolve, depending on the nature of the product and process for addressing such issues. As a result, the subjective determination of a dilution horizon can be misleading. An effective horizon derived through credit memo sampling and analysis should prove more accurate. Factors that will be considered in assessing the adequacy of dilution samples include:

- Number of total credit memos versus number sampled,
- Seasonality in company operations,
- Inclusiveness of sample over time,
- Dilution type, and
- Credit processing location.

Although the criteria do not require ongoing credit memo sampling, many transactions have incorporated periodic recalculation of the dilution horizon. Typically on a quarterly or semiannual basis, a seller recalculates the dilution horizon based on a representative sample of credit memos. In some instances, sellers have recalculated the horizon based on 100% of credit memos.

Reserving For Carrying Costs

In every trade receivable transaction, a yield reserve is needed to cover interest and fees such as servicing and trustee which are expected to be incurred over an assumed amortization period. Trade receivables are noninterest-bearing assets. Therefore, the analyst needs to be comfortable that the discount applied to the receivables that were purchased by the special-purpose entity (SPE) before amortization is sufficient to cover the increased servicing cost throughout the assumed amortization period. (The discount also must cover any fees or expenses to be incurred by the SPE that are to be paid either senior to or *pari passu* with required investor payments). This is typically done as a function of the day's sales outstanding (DSO), which is a measure of receivable turnover.

The yield reserve is sized to cover interest and fees throughout the assumed liquidation period, which has generally been two times the DSO. Important considerations in evaluating the adequacy of reserves for carrying costs are:

- Volatility and length of the DSO,
- Assumed loss horizon, and
- Frequency of investor interest payments.

Servicing Fees

The transaction should reserve for the higher of the current servicing fee or the substitute servicing fee. This is particularly important because in most transactions, the existence of a servicer default that results in the replacement of the seller-servicer with a substitute servicer generally will trigger an early amortization in addition to subjecting the transaction to increased servicing costs. (Upon a bankruptcy of the seller, no new receivables will be purchased by the SPE.)

Interest

Reserving for interest expense in a fixed-rate transaction is relatively straightforward. The interest rate is multiplied by the principal amount of the SPE's liability, which is multiplied by a stressed liquidation period divided by 360. However, if the SPE is issuing floating-rate securities, reserving for interest becomes more complicated. The analyst needs to quantify the risk that during the liquidation period the index that determines the cost of funds may reset at a higher level than the initial rate. This analysis will be conducted on a case-by-case basis and will consider the following factors:

- The worst-case amortization period,
- The maximum number of resets that will occur on the liability during the period that the asset remains outstanding, and
- The historical volatility of the index over the maximum number of resets.

In the majority of transactions that offer investors a floating rate of interest, a stress factor of 1.5x has been applied to the interest rate index to address possible increases in the interest rate incurred over the course of the assumed amortization period.

Yield Reserve

One additional issue regarding carrying costs relates to the form in which the yield reserve is held. For example, what portion, if any, of the yield reserve needs to be in the form of cash versus receivables? Again, this becomes a portfolio-specific determination. If the portfolio has significant inherent liquidity (that is, high turnover relative to other trade receivable portfolios), the amount of yield reserve that must be held in cash generally will be a small percentage of the yield reserve. The factors, then, that drive this analysis are DSO and the volatility of the DSO. Consequently, historical DSO information is important because it may reduce the amount of yield reserve required to be held in cash.

Commingling

Trade receivable portfolios exhibit higher rates of payment and turnover than other asset types. Therefore, commingling risk takes on significant importance. For example, a portfolio has on average a 30-day DSO (and collections are received relatively evenly over the month) and collections are commingled with a seller rated lower than the rating sought on the transaction for two business days. There would be a risk to the transaction that two-thirtieths of the portfolio could be lost or held up in the event of a seller bankruptcy. This clearly is a large exposure to a securitized transaction.

To avoid having additional credit support to cover commingling risk, most transactions have incorporated the following procedures. First, all obligors are instructed to make payment to a lockbox account. Second, all lockboxes should be transferred to the SPE or trustee for the benefit of the security holders. Third, the lockboxes are swept daily to an account that is established either at a bank rated the same as the rating sought on the transaction or into a trust account held on the corporate trust side of the bank. Additionally, the servicer, unless rated the same as the rating sought on the transaction, should be prevented from accessing either the lockbox or sweep accounts.

Servicing Issues

In most trade receivable transactions, the seller of the receivables also will act as servicer. This is perhaps the most efficient way of servicing a securitized portfolio,

as the receivable systems are typically proprietary and, even if purchased, have usually been modified to better mesh with a particular seller's business. Nonetheless, Standard & Poor's strongly recommends that two features relating to servicing be in place in each rated trade receivable securitization.

First, there must always be provisions for a substitute servicer if the seller-servicer is unable to continue to service the portfolio or is relieved of its responsibilities due to a servicer default. This does not necessarily mean that there has to be a live backup servicer. However, the nature and complexity of the business may dictate that a live backup substitute servicer with direct experience in the applicable industry be somewhat actively involved in the transaction. For example, it may be receiving certain data on the receivables on a regular basis. This determination of the status of the substitute servicer will be made on a case-by-case basis. At a minimum, the trustee will be required to either appoint a substitute servicer or act as servicer if the original servicer ceases to act as such. Generally, upon servicer default, investors can terminate the servicer. Factors influencing the need for an on-line backup servicer include:

- The credit quality of the seller-servicer,
- The adequacy of the seller's systems, and
- The industry and nature of the seller's business.

Second, the fee to be paid to the substitute servicer should be stipulated in the transaction documents and be a sufficient amount to adequately compensate the substitute servicer for its role if it has to take on servicing and collecting activities. Additionally, as already mentioned, the substitute servicing fee must be reserved for up front and must cover the cost of servicing the portfolio through the expected amortization period.

Measuring Performance: The Sales-Based Approach For Trade Receivables

To capture the dynamic pool performance inherent in rapidly revolving pools of trade receivables, the vast majority of transactions have incorporated a dynamic credit support concept, which adjusts to reflect receivable delinquency and dilution performance during the most recent 12-month period. A performance-based, formula-driven approach can be advantageous for both the buyer and seller of trade receivable-backed securities. However, it should be understood that not all portfolios fit neatly into a performance-based model for credit enhancement. This approach is simply a framework for analysis.

The rating process maintains an open and flexible approach toward alternative structures. By the same token, the analyst will not apply a set of formulas used in an earlier transaction if the characteristics of the later transaction differ and the earlier structure is deemed inappropriate. Investors, sellers, and bankers should remember that every portfolio contains different risks, which must be addressed in the process of assigning a rating.

Ratings have been assigned to transactions that utilized different methods for deriving a dynamic credit enhancement. The key issue is that the enhancement is based on true credit quality and dilution risk indicators and quickly adjusts to reflect deterioration in portfolio performance. The following is an overview of an approach that has been used in a number of rated issues. The focus is on the rationale behind the more important elements of the approach.

In most transactions, a sales-based approach was used to measure receivable performance and the associated risks. Specifically, receivables performance was analyzed on the basis of the following ratios:

- Default ratio: Proxy for default plus actual write-offs divided by Sales generating such proxy for default, and
- Dilution ratio: Dilution divided by Sales generating such dilution.

Although these calculations appear simple, there are issues germane to each ratio. In the case of the default ratio, in addition to actual defaults as stipulated by a seller's credit and collection policy, there should be a conservative proxy for defaults defined up front. In the case of the dilution ratio, supporting data not usually tracked by a seller is needed.

Default Ratio

The sales-based default ratio is a way of measuring credit quality. It is difficult to identify and predict losses that are embedded in a portfolio of receivables because most sellers of trade receivable-backed securities do not have a formal charge-off policy (for example, 120 days past due), which would provide a consistent yardstick to gauge credit quality.

Table 1 is an example of the type of information that is typically received from sellers. Following through the aging buckets from the 61-90 days past due category to the greater than 91 days past due category, it is clear that there is an increase in the percentage and dollar amount in the greater than 91 days past due bucket, suggesting that receivables from more than one month's worth of sales are in this bucket and that they continue to age there. The question then becomes, in liquidation, how much of the receivable balance will be lost, and when will the balance be collected? However, it is difficult to predict accurately the level of losses and predict a payment stream on those receivables that will be collected by simply looking at the representative aging analysis above.

In most transactions, sellers have defined defaults so that portfolio credit quality can be accurately addressed. This is a two-step process. The first step is to define when a receivable will be deemed ineligible for financing. The second step is to gather information relating to the defined default period (for example, receivables 91 days past due). Given that most companies tend to settle their accounts receivable monthly,

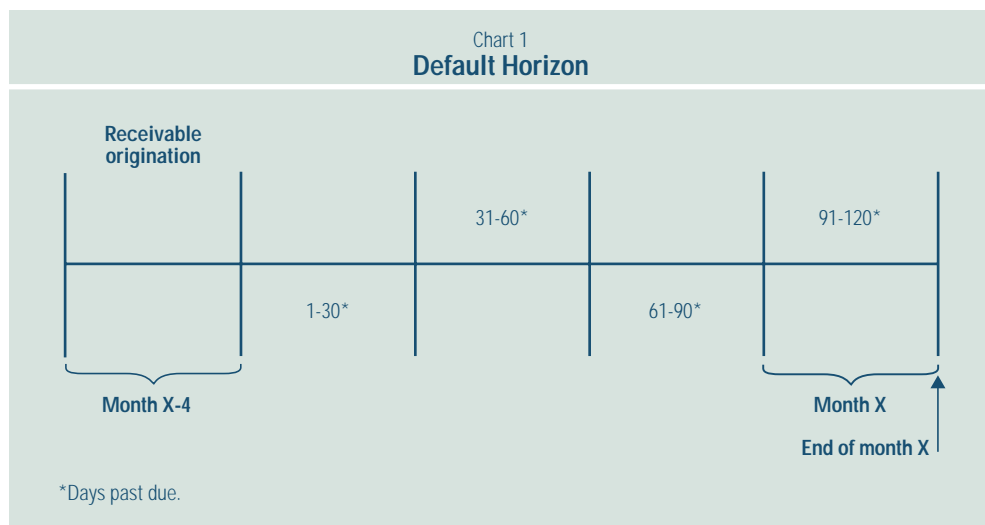
Table 1
Hypothetical Agings

Date	Total rec. (\$)	Current rec. (\$)	21-30 days past due (\$)	31-60 days past due (\$)	61-90 days past due (\$)	Greater than 91 days past due (\$)
June 30, Yr. 2	252,500	208,126	29,038	6,818	3,090	5,429
% of total	100.00	82.43	11.50	2.70	1.22	2.15
May 31, Yr. 2	295,700	242,474	35,780	6,210	2,809	8,427
% of total	100.00	82.00	12.10	2.10	0.95	2.85
April 30, Yr. 2	335,000	277,715	40,200	6,198	3,183	7,705
% of total	100.00	82.90	12.00	1.85	0.95	2.30

monthly historical information setting forth the dollar amount of receivables in the 91-120 days past due bucket is requested. This information would be used in the numerator of the default ratio as the proxy for losses.

The sales-based approach to measuring loss and dilution performance analyses historic loss and dilution experience as a percentage of receivable origination (credit sales). Therefore, when using delinquency as a proxy for loss, for example, receivables that are delinquent 91-120 days past due (see *chart 1*), the proxy must tie back to the level of receivable generation during the time when the delinquent receivables were generated. To do this, the payment terms that the company offers to its customers must be understood. Assuming that a company offers payment terms of net 30 days only, there would be a 30-day period before the receivable would be considered delinquent or past due. Having these two pieces of information, the 91-120 day past due bucket can be accurately tracked back to its origin. If there are 30-day payment terms (one month) and receivables in the 91-120 days past due bucket are considered defaulted (there are three months when the receivable is delinquent but not defaulted), it was sales four months prior that gave rise to the deemed default bucket. This four-month period is known as the default horizon, and should not be confused with the loss horizon, which is discussed below. The receivables that were delinquent 91-120 days past due date at the end of month x were all originated during month x-4 (see *chart 1*). The following default ratio could be used as a measure of expected losses that would occur from a given month's sales: Receivables 91-120 days past due plus actual write-offs divided by monthly sales generated four months prior.

A sales-based approach mitigates the effects of several problems. First, by matching the resolution (that is, collection, loss or dilution) with the generating sale, seasonal



effects are reduced or eliminated and pool performance can be roughly predicted with a minimum amount of information. For example, if a default ratio similar to the above formula is used, skewing of the ratio by seasonality is no longer a concern.

This is best illustrated through a sales-based approach diagram (see chart 2).

Assumptions:

- 30-day payment terms,

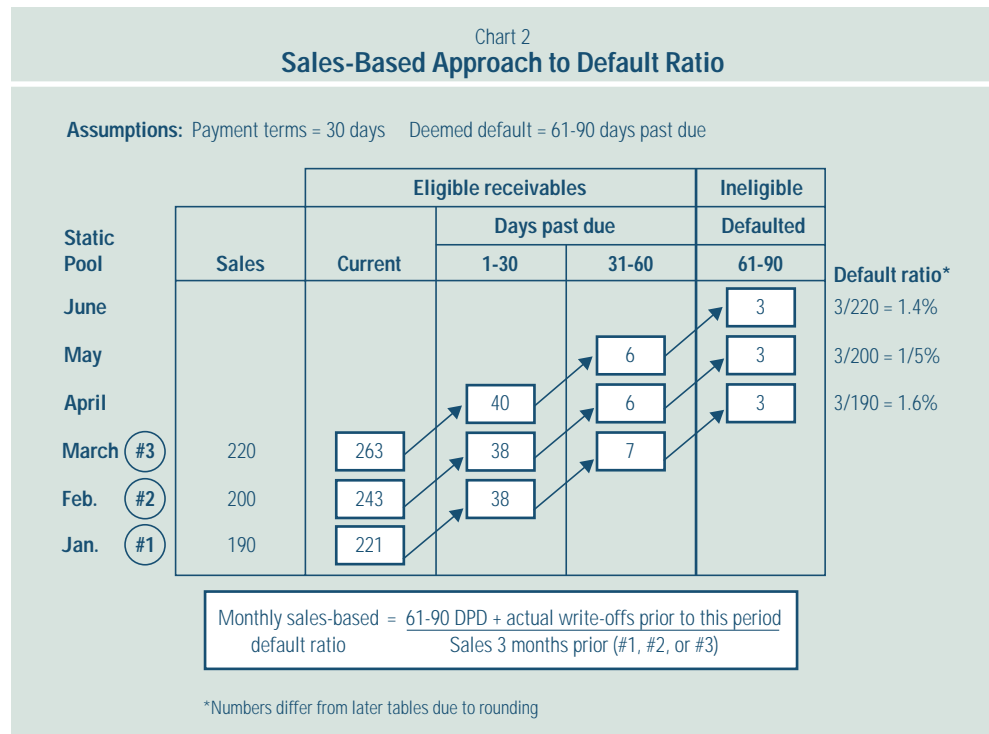


Table 2
Comparison of Deemed Default Calculations

Date	Eligible rec. (\$)	Sales (\$)	61-90 days past due (\$)	Default proxy as a % of elig. rec (1)	Default proxy as a % of sales 3 mos. prior (2)	Difference (2)-(1) (%)
June 30, Yr. 2	243,981	175,000	3,090	1.27	1.40	0.14
May 31, Yr. 2	284,463	195,000	2,809	0.99	1.40	0.42
April 30, Yr. 2	324,113	230,000	3,183	0.98	1.68	0.69
March 31, Yr. 2	308,000	220,000	3,200	1.04	1.68	0.65
Feb. 28, Yr. 2	286,500	200,000	4,500	1.57	2.14	0.57
Jan. 31, Yr. 2	261,938	190,000	4,400	1.68	2.20	0.52

- Deemed default bucket equals 61-90 days past due, and
- Three-month default horizon.

The information in table 2 is representative of the kind of data companies are accustomed to collecting. However, the data in the table has been presented specifically to illustrate the above point regarding seasonal effects. Note that the dollar amount in the 61-90 day bucket decreases at the same percentage rate as the sales balances in the month that is three months prior. For example, between the periods of February and March, the sales increased by \$20,000, or 10% of the previous month's sales. As of May 31 and June 30, the amounts in the 61-90 days past due bucket increased by \$281 or 10% (rounded for illustrative purposes) of the previous month's amount. If default proxy 1 is used as a measure of losses, where the percentages are based on eligible receivables, seasonal distortions skew the proxy measure. In contrast, the sales-based default proxy measures the aging bucket back to its creation, which eliminates the skewing effect of seasonal changes in the size of the portfolio, and results in a constant proxy for losses.

When the sales-based approach is used, data requirements are less strenuous. As long as monthly sales and agings are known, the methodology can be applied (albeit with some refinement) to any pool of trade receivables. Additionally, if horizons can be determined, dilution proxies can be calculated in the same fashion as defaults and, therefore, proxies for both losses and dilution can be measured with relatively little difficulty.

Dilution Ratio

The dilution ratio is designed to measure expected dilutions. As is the case with the defaults, the ratio tracks the amount of dilution back to its origin. Unfortunately, determining a statistical dilution horizon is somewhat problematic. In general, companies do not age their dilutive items relative to an invoice date. Therefore, historical information that can be analyzed in the same fashion as defaults above tends not to be available. To address this issue, sellers randomly sample credit memos and age the credit memos back to the original invoice. Generally, a dollar-weighted average of the time it took for the credit memo to be issued relative to the invoice date is used as the dilution horizon. Once the dilution horizon is known, the dilution ratio can be calculated. This is done by following the same procedures that are used in calculating the default ratio. For example, if there is a two-month dilution horizon the current month's dilutions are divided by the monthly sales generated two months prior.

Calculating Credit Enhancement For Trade Receivables

Once proxies for both defaults and dilution have been established, these measures can be incorporated into reserve calculations. The majority of trade receivable transactions have used dynamic credit enhancement that resets monthly, on the basis of portfolio performance. In general, the required credit enhancement will be the greater of:

- The sum of loss reserve plus the dilution reserve (the dynamic reserve), or
- The credit enhancement floor.

Dynamic Reserve

Loss Reserve

The loss reserve is calculated using an equation that multiplies the stress factor by the loss ratio by the loss horizon ratio. Table 1 sets forth the benchmark stress factors for the applicable requested ratings. Note that these multiples are not absolute and can be adjusted upward or downward on the basis of the specifics of a particular transaction, such as seller, obligor, product, and industry characteristics. The structural aspect of the transaction also may influence the evaluation of stress factors. However, the table figures serve as the benchmarks in the analysis.

AAA stress factor	AA stress factor	A stress factor	BBB stress factor
2.5x	2.25x	2.0x	1.5x

Note that the above multiples are relatively low compared to stress factors used for other asset types in the same rating categories. This is primarily attributable to four factors:

- *Short-term nature of the assets.* Given the fact that most trade receivable pools will turn over entirely in a short period of time, the length of time over which a transaction is subjected to credit and dilution risk is comparatively short relative to other types of assets.
- *Dynamic nature of the reserves incorporated in most trade receivable transactions.* A lower rating multiple is acceptable at the outset of a transaction because deviations in portfolio performance will be addressed each month during the life of a transaction.
- *The inherent recoveries in each transaction.* Inherent recoveries refers to collections on receivables that come in after the default horizon. These collections are difficult to quantify, but nonetheless will be passed through according to the allocation mechanism stipulated in a transaction, thus benefiting a transaction.
- *Collections from ineligible receivables.* In the same manner as inherent recoveries, collections from ineligible receivables will be passed through, again benefiting a transaction.

The loss ratio in recent transactions has been calculated as the greatest three-month rolling average default ratio over the previous 12 months. As a result, credit enhancement will quickly adjust for deteriorating portfolio performance but will require 12 months of strong performance to remove the effect of a single quarter's poor performance. There are two additional noteworthy points about the loss ratio calculation.

First, rolling averages tend to dampen the effect of monthly aberrations. Second, because of the high payment rates and, therefore, high turnover that trade receivable pools exhibit, 12 months' worth of data is used in formulating a loss reserve. (Actually, 14 months of data are needed since the loss ratio utilizes a three-month rolling average of the default ratio, thus requiring the default ratio for the 13th and 14th prior months.) This look-back is done to ensure that any seasonal performance problems are addressed in sizing the reserve. As the reserves adjust monthly, based on historical performance versus being based on performance triggers, the size of the reserve needs to be large enough to protect against an amortization at any point during the year. Therefore, calculating the reserve needs to incorporate information that reflects a year's worth of performance.

The loss horizon ratio (in conjunction with the loss ratio) is a method of determining the amount of losses embedded in a portfolio at any point in time. As already described, the loss ratio is calculated using a sales-based approach and represents an estimate of losses as a percentage of the generating sale. Therefore, if the loss ratio is known, the pertinent questions then become:

- How many months of sales are embedded in the portfolio at any point in time?

- For each month of sales in the amortizing pool, what was the dollar amount of sales?

Once the answers are available, the loss ratio is simply multiplied by each month's worth of sales embedded in the portfolio. The result becomes the amount of losses expected to be incurred during amortization.

In terms of the first question, the sellers, in consultation with their bankers, have established a date of delinquency, after which a receivable will no longer be eligible for financing. This time period is referred to as the loss horizon—the invoice date to the date at which the receivable is no longer eligible (not to be confused with the default horizon). For example, if a receivable is not considered eligible after being 60-days delinquent, and the company offers net 30-day payment terms, the loss horizon would be three months.

With regard to the second question, it is simply a matter of looking back to each of the prior month's sales at the end of a reporting period and keeping track of the data.

With those two questions answered, the expected level of losses is derived by multiplying the loss ratio by the credit sales that the seller generated during the loss horizon. This is best illustrated through the following example.

Assumptions:

- 30-day payment terms;
- After 60 days past due, a receivable is no longer eligible;
- Monthly sales are always \$100; and
- The greatest three-month rolling average over the prior 12 months of the default ratio is 1%. (That is, the loss ratio is 1%.)

Conclusion:

- Three-month loss horizon;
- One percent of each month's sales from the preceding three months are expected to be lost; and
- With a three-month loss horizon, there are three months of sales embedded in an amortizing portfolio;
- Therefore, the expected loss will be prior month 1 ($\$100 \times 1\%$) = \$1; prior month 2 ($\$100 \times 1\%$) = \$1; and prior month 3 ($\$100 \times 1\%$) = \$1, which totals \$3 of expected losses.

Thus, the dollar amount of losses expected to be incurred during amortization is determined. (This amount is multiplied by the stress factor to arrive at the stipulated amount of credit enhancement.) The protection against these assumed losses comes in the form of receivables. To calculate the percentages of eligible receivables needed as credit enhancement, the cumulative amount of sales during the loss horizon is divided by the current month's net eligible receivable amount. In formulaic terms,

the loss horizon ratio is equal to the cumulative sales in the loss horizon divided by current month's net eligible receivable balance.

Table 2 shows the required loss reserve calculated using the previously outlined methodology.

Assumptions:

- 30-day payment terms;
- Receivables deemed ineligible at 61 days past due (therefore, three-month loss horizon); and
- Daily monitored eligible receivables balance.

One of the assumptions made in table 2 is that the eligible receivables balance is monitored daily. This is of particular importance when determining the loss horizon. If the eligible receivables balance cannot be monitored daily and can be monitored only monthly because of limited systems capabilities, another month would be added to the loss horizon. This is done because the intramonth performance of the pool would not be known, and, therefore, amortization events relating to the adequacy of reserves would not be triggered until the end of the month (rather than triggered on any day during the month when the monthly settlement statements are prepared).

Another factor may be required where receivables are aged on a due-date basis rather than on an invoice-date basis. If the seller makes use of a variety of payment terms, a weighted average of the payment terms may be applied to modify the loss horizon. For example, if the portfolio's weighted average payment term was 40 days, the numerator of the loss horizon ratio should be modified so that it includes three and one-third months of sales in the example above.

If transactions do not limit receivable payment terms or portfolio weighted average payment terms to a fixed number of days, a recalculation of the weighted average

Date	Eligible rec. (\$)	Sales (\$)	Loss ratio (1)	Loss horizon ratio (2)	Stress factor (3)	Required loss reserve (%) (1)x(2)x(3)
June 30, Yr. 2	243,981	175,000	2.28	2.5	2.5	14.03
May 31, Yr. 2	284,463	195,000	N.A.	2.3	2.5	N.A.
April 30, Yr. 2	324,113	230,000	N.A.	2.0	2.5	N.A.
March 31, Yr. 2	308,000	220,000	N.A.	2.0	2.5	N.A.
Feb. 28, Yr. 2	286,500	200,000	N.A.	2.0	2.5	N.A.
Jan. 31, Yr. 2	261,938	190,000	N.A.	2.3	2.5	N.A.

N.A.—Not available.

payment terms, and thus the loss horizon, on a monthly or quarterly basis will be requested.

Dilution Reserve

As already noted, “dilution” is the term used to define any noncash adjustment to the receivable balance. As there are numerous causes of dilution in trade receivable portfolios, the analyst spends a great deal of time trying to understand both the reasons for dilution and the classification of dilutive items. To make the rating process easier, it is best to have as much information relating to dilution as possible before the review visit. This way, more time can be spent trying to understand the nature of dilution rather than trying to identify its cause.

Understanding dilution risk actually becomes an issue of classifying credit memos or similar instruments that represent dilutive items and determining whether they can be contractually quantified. For example, if a company offers payment terms of 2/10 net 30, then it is known that a particular customer may take a 2% discount on its invoice if the customer pays within 10 days. This 2% dilutive item is clearly quantifiable and will never be greater than 2% (unless the company changes its payment terms). Therefore, with this quantifiable dilutive item, it is not necessary to stress this amount for purposes of credit support calculations, because it will never be any greater than 2%. On the other hand, returns due to product defect, while they may be predictable, are not contractually limited and, therefore, are subject to stress for purposes of calculating credit support.

Additionally, many of these causes can be particularly volatile in both the timing and amount in which they occur. As a result, they pose a particular problem in sizing credit enhancement to cover the dilution risk in amortization. To address this issue, a specific component has been incorporated into the reserve calculation to cover dilution volatility above and beyond a base level of dilutions.

A number of dilution reserve formulas have been used in past transactions. Most have applied a dilution reserve equation similar to (stress factor multiplied by the dilution ratio) plus (dilution volatility) multiplied by the dilution horizon ratio.

Or, broken down even further:

$[(SF \times ED) + ((DS - ED) \times DS/ED)] \times DHR$, where:

- SF = Stress factor,
- ED = Expected dilution,
- DS = Dilution spike, and
- DHR = Dilution horizon ratio.

The goal of this reserve equation is to stress the base or expected level of dilution and add to that component of the reserve a cushion to address dilution volatility. The following elaborates on the above acronyms and explains the above reserve equation. The benchmark stress factors for the dilution reserve are the same as for

the loss reserve. Again, these factors are not absolute, but they are the starting point for the analysis. Based on a portfolio-specific analysis, it is possible to have different default and dilution stress factors in the same transaction.

The expected dilution measure is calculated as the rolling 12-month average of the dilution ratio. Again, a 12-month rolling average is used to dampen monthly aberrations and to serve as a protective measure for dynamic reserve calculations. The dilution ratio calculation would not include dilutive items that are contractually quantifiable and specifically reserved.

Dilution spike captures the worst aberration of the dilution ratio over the same 12-month period used in calculating expected dilution. It is the highest dilution ratio

Table 3
Dilution Ratio Statistics

Date	Dilution ratio (%)	12-mo. rolling avg. (%)	Expected dilution (%)	Dilution spike (%)
June 30, Yr. 2	5.40	4.89	4.89	5.40
May 31, Yr. 2	5.00	4.80	4.80	5.30
April 30, Yr. 2	5.00	N.A.	N.A.	N.A.
March 31, Yr. 2	4.90	N.A.	N.A.	N.A.
Feb. 28, Yr. 2	4.40	N.A.	N.A.	N.A.
Jan. 31, Yr. 2	4.60	N.A.	N.A.	N.A.
Dec. 31, Yr. 1	5.30	N.A.	N.A.	N.A.
Nov. 30, Yr. 1	5.20	N.A.	N.A.	N.A.
Oct. 31, Yr. 1	4.70	N.A.	N.A.	N.A.
Sept. 30, Yr. 1	4.90	N.A.	N.A.	N.A.
Aug. 31, Yr. 1	5.10	N.A.	N.A.	N.A.
July 31, Yr. 1	4.20	N.A.	N.A.	N.A.
June 30, Yr. 1	4.30	N.A.	N.A.	N.A.

N.A.—Not available.

Table 4
Calculation of Dilution Reserve Components

Date	Expected dilution (1) (%)	Dilution spike (2) (%)	Deviation (3)=(2)-(1)(%)	Gross-up factor (4)=(2)/(1)	Volatility component (3) x (4) (%)
June 30, Yr. 2	4.89	5.40	0.51	1.10	0.56
May 31, Yr. 2	4.80	5.30	0.50	1.10	0.55
April 30, Yr. 2	N.A.	N.A.	N.A.	N.A.	N.A.

N.A.—Not available.

over the prior 12-month period. The dilution spike is an integral part of the equation used in capturing dilution volatility.

In table 3, the dilution spikes of 5.4% and 5.3% assume that there is a one-month dilution horizon. However, if the dilution horizon is two months, the dilution spike will be calculated as the highest two-month rolling average of the dilution ratios over the previous 12 months.

The dilution horizon ratio serves the same purpose as the loss horizon ratio and is calculated in the same fashion as the loss horizon ratio. The dilution horizon formula divides the cumulative sales over the dilution horizon by the current month's net eligible receivables.

With the components of the dilution reserve defined, the methodology can be explained. The first component of the dilution reserve is the appropriate stress factor multiplied by the expected dilution measure. This part of the equation is not much different than the core of most structured finance methodology: multiplying an expected level of risk times a stress factor. The second component of the equation is an additive amount that addresses proportionate deviations from the expected dilution measure. More specifically, it measures the deviation (dilution spike minus expected dilution) from the expected level of dilution and multiplies that amount of deviation by a factor that is defined by the two figures used in arriving at the deviation. Table 4 illustrates the calculation.

As expected, in instances where there is more deviation from the expected level of dilution, the corresponding volatility component increases. Therefore, by implementing this feature into the dilution reserve, those portfolios exhibiting low volatility benefit relative to portfolios with higher volatility.

The dilution horizon ratio serves the same purpose as the loss horizon ratio. It translates a dollar amount of dilution expected during amortization of a receivable portfolio into a receivable-based ratio. Table 5 shows the resulting dilution reserve using this methodology.

Assumptions:

- One-month dilution horizon;
- Eligible receivables balance monitored daily; and
- 2.5 stress factor.

Concluding the dynamic reserve part of calculating credit enhancement simply becomes a matter of adding the loss reserve and the dilution reserve together.

Reserve Floor

The purpose of the credit enhancement floor is to ensure that risks that may not be fully captured in the dynamic credit enhancement calculation are covered. In addition to factors specific to each portfolio and seller, structural characteristics of the transaction, such as the dynamic support calculation, amortization event triggers, eligibility criteria, and frequency of compliance checks will affect the evaluation of the credit enhancement floor. At a minimum, the reserve floor is a function of reserving for stipulated concentrations as well as an expected level of dilutions. Here again, there are two additive components to the reserve floor as shown in the following formula: Concentration factor plus the expected dilution multiplied by the dilution horizon ratio.

The first component of the reserve floor is the concentration exposure component. In other words, it is a reserve to protect against the likelihood that during amortization a certain number of obligors will default on their obligations to make payment for goods or services received, thus reducing cash flow to the securitization.

To address this concern, a matrix serves as a guideline for the number of obligor concentrations that should be covered by reserves. Table 6 sets forth the number of obligors that, at a minimum, must be reserved for in a transaction. The table contains the matrix with the desired rating on the top of the table and the obligor ratings along the left side of the table. The matrix works in the following way. Given the parameters set forth in the structure, the minimum concentration coverage percentage will be the greatest single result produced by multiplying the number of concentrations required to be covered for each obligor rating and the allowable concentration percentage. This will be the concentration component of the reserve floor.

Table 5
Calculation of Required Dilution Reserve

Date	Eligible rec. (\$)	Sales (\$)	Expected dilution (%)	Dilution spike (%)	Dilution horizon ratio (x)	Stress factor (x)	Required dilution reserve (%)
June 30, Yr. 2	243,981	175,000	4.89	5.40	0.72	2.5	9.17
May 31, Yr. 2	284,463	195,000	4.80	5.30	0.69	2.5	8.60
April 30, Yr. 2	324,113	230,000	N.A.	N.A.	0.71	2.5	N.A.
March 31, Yr. 2	308,000	220,000	N.A.	N.A.	0.71	2.5	N.A.
Feb. 28, Yr. 2	286,500	200,000	N.A.	N.A.	0.70	2.5	N.A.
Jan. 31, Yr. 2	261,938	190,000	N.A.	N.A.	0.73	2.5	N.A.

N.A.—Not available.

The following example shows how the matrix works (see table 7).

Assumptions:

- 'AAA' rated transaction; and
- Receivables from 'A-1+', 'A-1', 'A-2', 'A-3', and all noninvestment-grade or unrated obligors in excess of 10%, 8%, 6%, 3%, and 2%, respectively, will be considered ineligible for purposes of calculating the net eligible receivable balance.

Historical default experience also is considered in relation to the proposed credit component amount. The above assumed concentration limits, plus the given parameters, derive a 12% minimum credit component to the reserve floor.

There are a few important points that should be known about applying the concentration matrix to a transaction. First, the number of concentrations to be covered according to the matrix serves only as a guideline and may be adjusted upward or downward based on the characteristics of the portfolio and the composition of the obligors making up the portfolio. Second, the matrix is intended for highly diversified portfolios with extremely low historical loss experience and a small number of obligors that come close to or exceed the stipulated concentration limits.

Table 6
Benchmark Concentration Coverage⁽¹⁾

Obligor rating	Transaction rating			
	AAA	AA	A	BBB
A-1+	0	0	0	0
A-1	1	1	0	0
A-2	2	2	1	0
A-3	3	3	2	1
NIG/Unrated ⁽²⁾	5	5	4	3

(1) Assumes payment terms of 45 days or less.
(2) NIG—Not investment grade.

Table 7
Calculation of Credit Component of Reserve Floor⁽¹⁾

Matrix requirements	Concentration limits (%)	Exposure to Concentrations (%)	Credit component to reserve floor (%)
Cover zero A-1+ obligors	10	0	—
Cover one A-1 obligors	8	8	—
Cover two A-2 obligors	6	12	12
Cover three A-3 obligors	3	9	—
Cover five NIG/unrated obligors ⁽²⁾	2	10	—

(1) Assumes payment terms of 45 days or less.
(2) NIG—Not investment grade.

Additionally, concentration risk with respect to dilutions could also affect reserve floor calculations. Third, to the extent that “concentration basket” proposals are submitted to address significant concentrations above and beyond the limitations imposed by the matrix, the analyst will independently review the proposals, at which time the matrix may be partially disregarded and more stringent criteria may be incorporated.

The second component of the reserve floor is the dilution component. The dilution component is the expected dilution measure multiplied by the dilution horizon ratio as both of the measures are calculated in the dilution reserve. Therefore, the reserve floor is calculated as the sum of the credit component of the reserve floor and the dilution component.

While the calculation of the reserve floor is simple enough, one may wonder why the concentration risk should be addressed in this fashion. The reason is that if the floor simply covered concentrations, only credit risk would be addressed, and, therefore, one of the primary risks in the trade receivable transactions—dilution—would be completely ignored.

Although these calculations explain the heart of the credit enhancement analysis, a formula-driven methodology will never be entirely suited for a trade receivable transaction. Therefore, it is important to remember that in each transaction that reviewed, additional factors relevant to the seller’s business, industry, or portfolio will be analyzed. Moreover, these factors may be viewed as mitigating factors to the above calculations (reducing the required support), or conversely they may be viewed as additive risks (increasing the amount of required credit support). In either case, there will be transaction-specific issues that need to be addressed as they relate to both the structure and the credit enhancement calculation.

Special Considerations For Health Care Receivable-Backed Transactions

While generally similar to that used for trade receivable-backed transactions, health care receivable criteria address various risks and issues unique to this asset type. Because of the unique features of health care receivables, there are data requirements specifically for this subset of trade receivables (*see box*).

Historically, rated healthcare receivables transactions have been backed exclusively by receivables generated by providers in the United States. Hence, the criteria only address issues pertinent to the US health care delivery system. Health care markets differ greatly across countries and extensive analysis of these differences, and any resulting risk factors, would be required to rate a transaction backed by receivables generated outside of the United States.

Net Receivable Valuation

By far, the most significant credit concern in health care transactions is net receivable valuation. Typically, when a patient is treated for an illness, his or her primary health insurer pays only what it deems to be reasonable and customary, as reflected in its negotiated contract with the provider. The unpaid portion of the gross billing is viewed by the health care provider as its contractual allowance, the amount that it will not receive from the patient's primary insurer. The provider may attempt to obtain the full gross amount through subsequent billings to a secondary insurer and, if necessary, to the patient, who sometimes must satisfy a deductible or copayment.

The provider knows for certain what the contractual allowance is only after it receives reimbursement. There are exceptions: Medicare, some Medicaid programs, and some private insurers reimburse on the basis of preset rates that a provider can encode into its billing system. The provider, or some other party to the securitization, however, must be able to estimate the contractual allowance in advance of actual receipt of the reimbursement. The estimation methodology used may be based on

the application of rolling average historical collection rates to the gross receivable balances, for instance.

A securitized transaction only purchases the net receivable, which is the receivable net of amounts the provider or third-party servicer estimates will not be reimbursed by the insurer. If a securitization program were to purchase the gross medical bills, there would be significant dilution. Substantial additional enhancement to absorb the payment shortfall would be necessary.

Data Requirements

In addition to the standard information requested for trade receivable-backed transactions, the analyst requests the following information for a health care receivable-backed transaction. These represent minimum requirements, and additional information may be requested throughout the rating process.

Health Care Receivable Portfolio

- Medicare and Medicaid cost report settlements for the last three to five years;
- A breakdown of the top nongovernmental third-party obligors and their related ratings;
- Third-party obligor mix by obligor category; and
- Daily cash receipts, broken out by government versus nongovernment payment sources, for several months.

It also should be noted that there are a few deviations from the standard trade receivable portfolio data requirements.

- Monthly receivable balances should be reported net of any contractual allowances.
- Monthly billing amounts are applicable, rather than sales figures.
- No payment terms summary is required, since claims filed with third-party obligors for health care services and products generally have no stated payment terms.
- No credit memo sampling is required, since noncash reductions of health care receivables are generally limited to offsets and payment denials, which are billed to secondary third-party obligors and generally are not tracked as credit memos by health care providers.

Health Care Provider and/or Servicer

- History and recent developments;
- Organizational structure and management;
- Services, markets, and strategy;
- Financial performance;
- Insurance coverage verification procedures;
- Net receivables value estimation procedures;
- Billing procedures (inpatient and outpatient);
- Collections procedures, dispute resolution, and follow-up;
- Write-off policy;
- Medicare/Medicaid cost reporting experience; and
- Patient accounts receivable system and reporting capabilities.

In addition, the seller (or each seller if a multiseller program) will be asked to complete a questionnaire concerning operational information including:

- Third-party reimbursement agreements,
- Insurance coverage (malpractice),
- Litigation,
- Licensure status, and
- Utilization statistics.

Dilution

Since health care receivables must be funded net of contractual allowances, the real sources of dilution in health care portfolios are limited to:

- Errors in estimating receivable net values, measured as payment denials;
- Health Care Financing Administration offsets of provider overbillings under the Medicare and Medicaid program; and
- Offsets of tax liabilities by governmental taxing authorities.

Payment Denials

Payment denials represent partial or nonpayment of a claim by a third-party obligor. Denials occur for a variety of reasons and sometimes follow lengthy disputes. An obligor may disagree with the provider about the appropriateness of a diagnosis and method of treatment and deny payment. If the bill is particularly large, the obligor may audit it for reasonableness and then deny all or a portion of it. The obligor may not cover a particular medical procedure. Whatever the reason, it is possible to measure a provider's accuracy in estimating the contractual allowance and net value by reviewing its historical payment denial amounts and denial rates. The extent of its accuracy reflects not only the quality the provider's methodology for estimating contractual allowances, but also the effectiveness of its preservice insurance coverage verification procedures and the quality of its diagnostic efforts and medical care. Typically, a denial rate component is added to a default reserve to cover the net value estimation risk.

Medicare And Medicaid Offset Risk

A legal concern that has credit sizing implications is Health Care Financing Administration offset risk. This risk involves the statutory right of the administration to withhold amounts by which it was overbilled in previous years from payments it currently owes to a provider. The overbilling is determined when the administration audits a provider's annual cost report, which presents actual provider costs as compared to government reimbursements under the Medicare and Medicaid programs. Reimbursement that exceeds actual costs is evidence that the government was overbilled. This risk is declining, as the government gradually phases in the use of preset reimbursement rates. These preset rates reduce the likelihood and the opportunity for overbilling.

A bankrupt provider will be unable to repay a prepetition overbilling. The government will have the right to withhold payments owing to the bankrupt provider on prepetition receivables that were securitized to the extent of any unsatisfied cost

report liability. Since seller bankruptcy is assumed as part of the structural analytic approach, it follows that some sort of offset coverage is necessary.

The Medicare and Medicaid cost report liability offset reserve is sized to provide a cushion for the unknown outcome of the upcoming year's government audit of the annual cost report. This cushion is based on the provider's historical experience with overbilling the government, as reflected in its audited cost report settlements. The reserve has a dynamic floor that is sized at a multiple (usually 1.5x) the worst year's liability over the past three to five years. Added to this floor is the amount of any current accrued and unpaid cost report liabilities.

Tax Offset Risk

As with trade receivable portfolios that include government receivables, health care receivable portfolios are subject to the risk of offset of tax liabilities against payments due under government programs, such as Medicare and Medicaid. While trade receivable transactions generally limit exposure to government receivables, this approach is less feasible for health care receivable transactions, which tend to have significant government obligor concentrations. Thus, it is necessary that reserves be sized to cover potential tax liability offset risk in the event of the provider's bankruptcy. Various factors are taken into account in sizing this reserve including, the provider's historical accrued income and withholding tax liabilities; the frequency of payment of income and withholding taxes; and individual state and local requirements regarding the method of payment of income and withholding taxes.

Payment Delays

Although health care receivables portfolios experience little, if any, obligor credit-related defaults, they do experience significant payment delays. These receivables have no stated payment terms. The amount of time it takes to collect on a health care receivable is a function of servicing quality and obligor convention. Billing errors stemming from weak servicing slow down the reimbursement process. Obligor disputes over diagnoses and treatments and audits of particularly large bills also are a source of delays. Certain obligors by convention simply take a long time to process claims.

A health care receivable securitization program deems when it will stop funding an aged health care receivable. This occurs typically when the receivable has aged 181-210 days from the date of service and is a proxy for default. A proxy is required, since providers rarely write off uncollected amounts. Instead, these uncollected amounts are billed to secondary insurers or to the patients. To assess a transaction's exposure to payment delay risk, the analyst reviews a static pool analysis of receivables

that are included in the 181-210 days old aging category to assess an average default proxy for the portfolio.

Since a transaction writes an aged receivable down to zero, any eventual collection on the receivable is essentially a recovery. The extent to which the portfolio historically has collected on deemed defaults is assessed by reviewing historical monthly collections on receivables that are, for instance, over 180 days old. In many portfolios reviewed in this fashion, more than 90% of monthly-deemed defaults are offset by collections on aged receivables. However, some of those collections are on receivables that were deemed defaulted more than a year earlier. Generally, for an investment-grade rating, at most a 50% recovery rate is assumed. This assumption may vary on a case-by-case basis.

Third-Party Obligor Default

The obligor base of a health care receivables pool generally does not consist of the individuals receiving health care services and products but, rather, third-party insurers that cover these individuals' costs. As a result, these receivable pools tend to be much less diversified than trade receivable pools, with high concentrations of governmental obligors (primarily Medicare and Medicaid). Although a securitization program may place concentration limits on receivables of governmental obligors, ratings can be assigned without such limits for credit default purposes. The rationale is that Medicare and Medicaid receivables have a high investment-grade likelihood of payment because they are payable under programs of the U.S. federal and state governments.

Since nongovernmental obligors that default are the only source of credit-related default risk in health care transactions, it is recommended that concentration limits based on the obligor's rating be incorporated into the eligibility criteria for nongovernmental obligors.

The levels at which such limits must be set are not stipulated. However, since the nongovernment segment of most health care receivable portfolios typically is not highly concentrated, restrictive concentration limits for the weaker individual commercial insurers, HMOs, and Blue Cross and Blue Shield entities are not uncommon.

If dynamic credit enhancement is being used in a health care transaction, a default reserve floor must cover a certain number of these weaker individual nongovernmental obligor concentration limits. Alternatively, in the case of static credit enhancement, the number of speculative-grade and unrated nongovernmental obligors that could become bankrupt and deplete a static level of credit enhancement is assessed. It is then determined whether the resulting number of defaulted obligors is consistent with the rating category requested for the transaction.

Lockbox Account Structure

While it is preferable for collections on receivables in securitized transactions to flow to trustee-controlled lockboxes, this practice cannot be followed in health care securitizations. A health care securitization should comply with Medicare's and Medicaid's anti-assignment provision. This provision requires that all governmental payments for services furnished by a provider be made directly to the provider (or to a separate provider-controlled lockbox account), except for payments made to a government agency or under a court order or to a billing agent. The provider's bank should have standing instructions to sweep the account into a transaction's collection account, which is controlled by the trustee and is in the name of the transaction.

Compliance with the anti-assignment provision entails some potential commingling of provider monies with collections on sold receivables. Commingling in the account of the seller results in a potential ultimate loss risk of the funds held in that account on the date the seller files for bankruptcy. This risk arises from Section 9-306 of the Uniform Commercial Code (UCC), which addresses perfection issues related to proceeds of collateral. Accordingly, the analyst seeks to ensure that commingling at the provider is as brief as possible, at most 48 hours, and additional credit enhancement is sized to cover this bankruptcy-related risk.

Calculating Credit Enhancement

A growing number of issuers of health care receivable-backed securities are using dynamic credit support, even going so far as to apply the trade receivable criteria's sales-based approach to sizing dynamic loss and dilution reserves. However, the basic approach to sizing credit enhancement for health care receivables has been relatively straightforward. First, credit enhancement is sized for payment delay risk and for net valuation errors. Then, four variables are determined:

- The expected default rate,
- An assumed recovery rate,
- The ratings multiple, or stress factor, and
- The maximum default horizon.

The expected aging default rate is the historical average monthly static pool proxy aging default rate, which is a quotient equal to aging defaults in a month divided by originations in some preceding month. If historical monthly denial or write-off statistics are available on a static pool basis, either of these should be added to the monthly aging default statistics to arrive at a total monthly expected default rate. If such statistics are unavailable, a base case denial rate of 1.5% may be assumed and added to the expected aging default rate to arrive at this total.

Depending on the requested rating, the analyst will assume that a certain percentage of the expected level of defaulted receivables is recovered. The recovery rate will be a function of the actual historical percentage of aging defaults that are recovered within 12 months of the default.

The ratings multiple to be applied as a stress factor to the expected default rate net of a recovery rate is a function of the requested rating. The following ratings multiples, which mirror those used in the trade receivables criteria, are applicable:

- 'AAA': 2.5,
- 'AA': 2.25,
- 'A': 2.0, and
- 'BBB': 1.5.

These multiples serve as benchmarks only and may vary based on portfolio-specific analyses. They convey the extent to which, in various stressed scenarios, default performance will deteriorate. Credit support must be adequate to absorb such deterioration during a maximum default horizon.

The maximum default horizon is a function of the securitization program's definition of an aging, or deemed, default. For instance, if a receivable becomes defaulted when it has aged past 180 days from the date of billing, the maximum default horizon is six months. In the case of inpatient acute care facilities, the more conservative date of discharge is used. The actual payout scenario could be shorter, depending on how quickly the pool turns over. However, when an early or scheduled amortization begins, the trust or SPE will own a portfolio of receivables of varying ages that over the next 180 days will either:

- Collect in full,
- Default by aging past 180 days or by being written off either following a payor bankruptcy or in accordance with a provider's credit and collection policies,
- Be diluted either by a payment denial (indicating a net valuation error) or by a government offset, or
- Be commingled with a bankrupt provider's bankruptcy estate.

When the four variables outlined above are determined, the credit enhancement required to cover aging defaults and net valuation errors is sized as follows:

Expected default rate multiplied by (1 minus recovery rate) multiplied by maximum default horizon multiplied by the rating multiple.

Next, credit enhancement is sized to cover government offset risk and the risk of loss of government payments commingled in a provider lockbox account on the day a provider becomes bankrupt. These additional amounts are added to the enhancement already sized for aging defaults and net valuation errors to arrive at a total credit enhancement percentage. Given the level of credit enhancement that is initially sized to cover the other potential losses in the transaction, such as aging defaults, commingling losses, and offsets, an assessment is made of the number of speculative-grade and

unrated private payors that could default on their payment obligations as a result of bankruptcy during an amortization, depleting that level of enhancement. Since most health care receivables transactions set stringent limits for weak private payors, a sizable number of these payors would have to fail during amortization before the credit enhancement sized for other types of losses would be exhausted.

Structural Considerations For Trade Receivables

Participants engaged in trade receivable securitization have taken advantage of most of the structural technology developed for use in earlier credit card and dealer note transactions. Among the most important structural considerations are the revolving period, early amortization events, cash flow allocation provisions, and eligibility criteria.

The Revolving Period

Under normal circumstances, the typical trade receivable pool will liquidate in two to three months, assuming the pool is relatively constant and all collections are used to pay down debt. To extend the life of trade receivable-backed securities, investors are paid only interest during the transaction's initial stage. During the initial interest-only period, payments that would otherwise be used to amortize investor principal are paid to the seller to purchase additional trade receivables. Thus, revolving interest-only periods allow the seller to set a maturity that matches the company's overall funding strategy as well as meet the investment targets of potential security holders.

The revolving period is followed by a principal amortization period during which investors receive monthly distribution of principal. As with earlier credit card receivable-backed issues, principal can be paid out as received, distributed on a controlled basis, or paid into a principal accumulation account for payment in one lump sum. To protect investors against deterioration in investment credit quality, early amortization events have been incorporated.

Early Amortization Events

Early amortization events are designed to enhance a transaction's credit quality by discontinuing the revolving interest-only period if reinvestment of investor cash flows becomes significantly less desirable. Early amortization events can, in effect, set limits on the worst-case scenarios. A strong set of early amortization events will

minimize credit enhancement levels. Although amortization events enhance credit quality, they can trigger the early unexpected return of investor principal. A rating does not address the likelihood of the occurrence of an early amortization.

The typical transaction will have a long list of events that could cause early amortization. Rated issues commonly include the following early amortization triggers:

- Bankruptcy of the seller or servicer;
- Material breach of representations, warranties, or covenants;
- Servicer default;
- Issuer becoming subject to the Investment Company Act of 1940;
- Deterioration of portfolio performance beyond specified levels (delinquency, write-off, or dilution triggers);
- Decline of credit enhancement to below required levels, or a borrowing base deficiency that is not cured for a specified period of time; and
- Filing of a lien on the receivables by the Internal Revenue Service or Pension Benefit Guaranty Corp.

In addition, there may be seller-specific triggers, such as the sale of a significant subsidiary.

Trade receivable transactions are, from an amortization perspective, very similar to other asset types that use revolving structures. However, because of the typically dynamic nature of the credit support and the frequency with which the receivable pools turn over, an amortization event is needed that addresses the maintenance of the required levels of credit support. More specifically, each transaction should have an amortization event that would trigger amortization if the net amount of eligible receivables for a specified period of time is less than required based on the stipulated levels of credit support. In conjunction with this trigger, there needs to be a structural mechanic prohibiting any release of cash flow, for reinvestment purposes or otherwise, until there are enough eligible receivables to enhance a transaction to required levels.

Cash Flow Allocations

Most trade receivable securitizations use a borrowing base concept. While the calculation of the borrowing base has varied, most rated issues have calculated the borrowing base as eligible receivables minus reserves. The rated instruments are then issued against the borrowing base. In this type of structure, investors are entitled to receive a percentage of collections equal to the investor amount over the borrowing base. The approach is designed to properly allocate collections to investors as well as to ensure that stipulated reserves are maintained. This percentage is generally fixed upon the occurrence of an amortization event. An alternative structure does not net reserves out of the borrowing base, but instead increases the numerator used to calculate the investor's share of collections by adding investor reserves. A number of transactions

have incorporated variable funding certificates and principal funding accounts to maximize funding and minimize the use of a seller certificate. Principal funding accounts also protect investors against early amortization, if the borrowing base of receivables falls below required levels. This protection is particularly important for portfolios that experience significant seasonality in receivable balances. To ensure that stipulated reserves are maintained, an amortization event will occur if the borrowing base plus cash held in a principal funding account falls below the investor amount and is not cured within a specified period. Also, no collections are released from the issuer if a borrowing base deficiency exists.

When a senior/subordinated structure is used, the subordinated class is not allowed to amortize if senior credit enhancement requirements are not satisfied. During a rapid amortization period, senior principal is paid down first. This is generally true for all revolving structures, but it is critical for trade receivable-backed issues. In most cases, more than half of the receivable pool would be expected to pay down in the first month of a liquidation scenario. If subordinated collections were released to the subordinated class (for example, not used to cover monthly defaults and dilutions), credit enhancement would evaporate quickly and not be available if needed in later months.

Eligibility Criteria

The eligibility criteria define the pool and limit investor exposure to high-risk receivables. There is typically a long list of eligibility requirements. Among the more common ones are:

- *Delinquent accounts.* Borrowing base calculations typically exclude receivables once they become past due beyond a specified delinquency category.
- *Excess concentrations.* To limit investor exposure to default by a large obligor, most structures set size limitations for individual obligors. Such concentration limits are generally set on the basis of the credit rating of the obligor and the credit enhancement floor.
- *Government obligor.* In U.S. transactions, the ability to assign government receivables may be limited by federal or state laws. Where government obligors are to be included, such laws must be researched by the seller's counsel to determine if the assignment would be valid. In addition, the government may be in a position to set off its obligations against amounts due from the receivable seller. Government obligor eligibility for non-U.S. transactions is determined on a country-by-country basis.
- *Executory contracts.* Receivables billed before completion of service or delivery of product are generally limited for two reasons. First, obligors are less likely to pay for a service or product that has not been received. Second, the receivable

may be considered an executory contract that could be rejected by the seller upon its bankruptcy.

- *Bill and hold receivables.* For a supplier to provide warehousing for certain customers is not unusual. In such cases, the supplier sells the goods to the customer but holds the inventory until the customer needs it. In the event of a bankruptcy of the supplier, the customer may attempt to stop payment on products that have not been shipped. In addition, collecting payment on other shipments to the customer may be difficult if there is bill and hold inventory that has been paid for but is not in the possession of the customer. A number of legal and practical issues must be analyzed when bill and hold receivables are securitized. When bill and hold receivables have been included in trade receivable pools, they have been limited to a small percentage of the pool to minimize exposure.

All asset-backed securities contain eligibility criteria. For other asset types, the eligibility criteria are designed to screen less desirable receivables to keep them from being added to the pool of securitized assets. In contrast, in a trade receivable transaction, the pool is screened on a periodic basis, and receivables that have become high risk are continually removed from the eligible pool. The investor is typically entitled to receive a share of all collections. The investor's share is calculated using the eligible pool as the denominator. As receivables become ineligible, the investor's share of collections increases. In addition, if the pool of eligible receivables falls below a specified level, the transaction will enter early amortization. Collections on ineligible receivables remain in the transactions and are allocated to the various classes of securities in the same way that collections arising from eligible receivables are allocated. As with early amortization events, a strong set of eligibility criteria will minimize credit enhancement levels.