

Funding through the Use of Trade Receivable Securitizations

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Abstract: A trade receivables securitization is a way for a seller to raise capital by selling certain trade receivable assets into a special purpose vehicle (SPV), on a revolving basis. This permits the SPV to raise capital by issuing notes or taking out a loan, using the trade receivable assets as collateral. The proceeds from the loan or note then flow back to the seller as purchase proceeds for the trade receivable assets. Such a transaction can typically garner a rating higher than seller's own corporate credit, thereby giving the seller access to greater liquidity at a lower cost of funds. Other advantages may include trade credit insurance and off-balance treatment. Structures, operations, and overhead can vary considerably, and there is room for optimization, customization, and fine-tuning; so, it is important for a seller to choose its securitization partners and arrangements carefully.

Keywords: securitization, trade receivables, accounts receivable, invoices, off-balance-sheet treatment, trade credit insurance, dilution, deductions, losses, write-offs, exclusions, eligibility, concentration, cross-border, multiple originators, multiple divisions, multiple business units, legacy systems, supplier finance, Statement of Financial Accounting Standard 140, international financial reporting standards (IFRS), CP conduit, trade receivables criteria, IAS 27, SIC 12, IAS 39

By various estimates, a tally of *accounts receivable* as reflected in the financial statements of U.S. companies would total approximately \$6 trillion. For purposes of this discussion, we will refer to accounts receivable merely as "receivables," companies that generate receivables as

"sellers," and we will only address commercial receivables (alternately referred to as *trade receivables*) and not consumer receivables. Receivables financing in various forms has been available for centuries. In addition to the older methods of factoring (estimated outstandings of \$85

billion) and asset-based loans (estimated outstandings of \$800 billion), receivables have been securitized (estimated outstandings of \$230 billion) since about 1985. Notwithstanding the history and breadth of funding techniques, it is these authors' opinion that receivables are generally inefficiently funded, despite their typical characteristics as one of the most creditworthy and most liquid financial assets on a balance sheet.

Various cash flowing assets, such as mortgages, automobile loans, and credit card receivables, have been successfully securitized on a broad scale. A new home mortgage has more than a 90% chance of being included in a securitization pool. However, by stark contrast, securitization of receivables represents less than 4% of the market size. Traditional wisdom and experience suggest that the pricing, transparency and structuring discipline of the capital markets (per the requirements of the securitization process), should result in the best possible all-in cost and most reliable funding for sellers. However, considerable barriers to entry exist; and, to date, sellers generally require both significant size and credit quality to successfully fund through receivables securitization.

Common challenges include achieving *off-balance-sheet treatment*, reduction of fixed costs, maximization of availability, preservation of cash-flow patterns, conformity and credibility of credit underwriting, credit enhancement, and conformity and credibility of servicing and reporting. Aggregation of multiple sellers, leveraging off similar transactions, and access to numerous capital market funding sources ameliorates fixed costs. A thorough examination of receivables performance and presence of third-party oversight can lead to an optimal deal structure. Daily fundings leave previous cash-flow patterns largely undisturbed. Robust due diligence with respect to sellers, and credit scoring across industries and countries with respect to obligors, provides consistent and reliable metrics for credit risk assessment. Receivables insurance reduces credit performance uncertainty, mitigates catastrophic risk, and enhances cash flow. Vigorous *invoice* verification, collections, and comprehensive reporting address the combined risks of fraud, seller servicer effectiveness, and seller default risk. Overcoming these challenges requires extensive securitization experience, as well as efficient and disciplined operational practices and procedures specifically designed to monitor and support trade receivables securitizations. The assistance of a third party having such expertise can be tremendously helpful, and may even be an outright requirement, in overcoming these challenges.

In this chapter, we discuss the major components of trade receivables securitizations, and explore a few of the structural considerations that must be addressed to achieve an optimal funding solution and fine-tune its behavior to a seller's needs.

REASONS TO SECURITIZE RECEIVABLES

The most common reason to securitize receivables is to efficiently raise cash. Enhancing working capital is espe-

cially important for sellers with long sales cycles and terms of sale. Given that receivables are typically the largest single asset category on the balance sheet, it is a natural choice for monetization. The *securitization* process generally provides sellers broader access to capital at a lower all-in cost of funds. This is especially true for sellers whose creditworthiness is weaker than their customers. In such instances there exists a credit arbitrage. A well-structured securitization can achieve an investment-grade rating even for a seller that is not investment-grade rated. Through some or all of the following: standardized underwriting, robust servicing, credit insurance and appropriate structuring, sellers can leverage their receivables to gain access to efficient capital markets financing.

Achieving balance sheet management objectives can be an additional reason why a seller chooses to securitize its receivables. Sale treatment can be achieved with the resulting opportunity to deleverage through the use of proceeds to redeem outstanding debt. Compliance with debt or loan covenants can be fostered through improvements in certain balance sheet ratios and metrics, including: days' sales outstanding (DSO), quick ratio, return-on-assets (ROA), and debt-to-equity ratio. Depending on the structure of the transaction, sellers can choose to remain anonymous, or can raise their profile in the capital markets as having been associated with an investment-grade issuance. Finally, with the proper structure and partners, *cross-border* receivables are eligible for securitizations, further expanding the amount of potential monetization.

RECEIVABLES SECURITIZATION

Receivables are securitized in two formats. The vast majority of receivables securitized to date have been funded through commercial paper (CP) conduits. Invariably, *CP conduits* provide sellers floating rates of interest, funding terms up to 364 days, relatively quick access to funding and anonymity. CP conduits are generally sponsored by banks such as ABN AMRO and Bank of America, and rated A1/P1. They often require collateral deemed at least A/A2 rated and purchase amounts usually exceed \$100 million. Access to this method of securitization has been historically limited to large sellers with good creditworthiness. Aside from CP conduits, multiyear stand-alone term securitizations have been completed for sellers in industries as diverse as health care, airlines, manufacturing, and advertising. Such stand-alone term issuances are usually significant in size to support the associated fixed costs and pay either floating or fixed rates.

Pricing for receivables funding varies by product. CP conduits typically provide pricing that ranges from the London Interbank Offered Rate (LIBOR) + 25 basis points (bps) to LIBOR + 150 bps (albeit actually indexed off CP). The pricing available through CP conduits is usually superior to traditional asset-based lending and factoring. Factoring arrangements are often priced relative to the prime rate, an index that, in the two decades from 1987 and 2006, averaged 254 bps higher than LIBOR. For most issuers,

the construct of multiyear funding available through term securitizations provides cheaper funding versus unsecured debt alternatives.

Traditional securitizations typically involve the formation of a special purpose vehicle (SPV). The bankruptcy-remote SPV, generally designed to be in compliance with Statement of Financial Accounting Standard 140, is usually formed by the seller. Receivables are transferred via a sales agreement into the SPV, with servicing generally retained by the seller. Thereafter, receivables represent the primary collateral for notes issued by the SPV. Cash received from obligors over time is then available for additional purchases of receivables; thus, in a revolving manner, notes are usually longer in duration than the underlying receivables. The notes issued are purchased by CP conduits or traditional fixed income investors.

Sellers generally, and mid-market sellers in particular, stand to benefit from another approach to the securitization structure. The SPV can be created by a third-party company to achieve a common-law true sale. This is especially comforting, as accounting rules regarding seller-sponsored SPVs periodically have come under intense scrutiny and revision. In addition, receivables can be sold with servicing released, further distancing the seller from the receivables. This streamlined and simplified structure means that the seller is not responsible for the securitization and credit enhancement process as they essentially are involved only in the sale of the assets.

Accounting rules differ by domicile of the seller. The accounting references provided above pertain to U.S. generally accepted accounting practices (GAAP) and related accounting practices. In Europe and certain other countries, the accounting disciplines imposed follow *international financial reporting standards (IFRS)*. With respect to off-balance-sheet treatment (in the context of IFRS, often referred to as “deconsolidation”) the requirements for achieving such an outcome are stringent and typically more difficult to achieve than under U.S. GAAP. Sellers must pay attention to *International Accounting Standard (IAS) 27, SIC 12, and/or IAS 39. Trade credit insurance* can be an important tool to achieving IFRS deconsolidation, as this technique facilitates risk transfer, an important element in achieving the typically preferred outcome. Whatever the applicable accounting rules and desired accounting treatment, it is important for the participants to involve the seller’s accountants as early as possible in the structuring process.

UNDERWRITING

While the securitization market has gotten comfortable with the credit underwriting performed by larger sellers, the market views the credit quality of the receivables of smaller sellers with more skepticism. Mid-sized sellers generally do not have sufficient infrastructure to support comprehensive credit underwriting of obligor risk. Terms of sale are often not adjusted to accommodate for differences in obligors. Sometimes, salespeople enter into sales contracts with customers without ever consulting credit

professionals as to the rationale of the terms of sale. Important buyers, as measured by sales volume, often easily escape discipline imposed on other buyers, and are effectively permitted uncontrolled terms of sale, resulting in irresponsible exposures. Inconsistencies across a seller’s customer base add further confusion. Unfairly or not, it is the perception of capital market participants that mid-sized sellers perform a weaker job of credit management than their larger brethren. The capital markets look to third parties to assess risk using credit scoring and trade credit insurance to mitigate risk.

CREDIT INSURANCE

The capital markets have expressed great interest in reliable insurance coverage for receivables. Currently, there are relatively few insurance companies that provide receivables insurance and even fewer that appropriately specialize. The relevant players are highly rated. However, the capital markets do not perceive the majority of available receivables insurance policies as comprehensive or sufficiently certain to pay claims. Conditionalities common to most property and casualty policies are contrasted with monoline insurance guarantees, and the typical discrepancies are tangible. In most instances, the issue is not the ability but rather the willingness to pay claims. Capital market participants demand policies with limited scenarios under which coverage could be denied. Success using trade credit insurance in facilitating optimal securitizations has been achieved, but tailoring the details and nuances of the policy constructs has proved critical to such implementations.

SERVICING

Servicing outsourcing facilitates access to receivables securitization for a broader range of sellers. The potential for fraud through grand-scale hypothecation can run into the billions of dollars. Once ownership of the receivables is transferred to the SPV, the servicing incentives of the seller may change. There is nontrivial risk in having the very party responsible for servicing and reporting on the receivables also being the entity borrowing against or selling the receivables. The perceived fraud risks of the traditional arrangement in which a seller is also the servicer are magnified for lesser-known mid-sized seller. It is also an empirically observed phenomenon that in the circumstances where sellers file for bankruptcy, their ability to perform as servicer is substantially impaired. Obligor also have a tendency to take advantage of a seller’s bankruptcy with accompanying disruptions in servicing, and payments are often delayed and/or diminished. Finally, sufficient transparency of the ongoing performance metrics of a receivables portfolio, achieved through comprehensive investor reporting, is important to optimal capital market interest and support. Outsourcing servicing responsibilities to a third party can mitigate capital market concerns with respect to servicing.

FUNDING AVAILABILITY

Availability under a trade receivables securitization adjusts according to the ongoing performance of the receivables. As one might expect, maintaining high-quality collateral is important and is rewarded with increased availability, while problems with receivables can result in higher reserves. There are specific implications of trade receivables performance that treasury professionals must understand in order to make the most of a securitization. There are also numerous effects that credit and collections practices and decisions have on the availability of funding in a trade receivables securitization. In particular, the performance metrics defined by a securitization may punish certain receivable transactions that are otherwise perceived as reasonable from the point of view of a collections manager, if the investor is unable to gain adequate comfort regarding such practices. Good practices may not be enough; the appearance of good practices is also important. Good practices and visibility into these practices can decrease the risk of short-term cash-flow disruption, increase long-term availability, and minimize the risk of premature termination of the facility.

Trade receivables securitizations come in many shapes and sizes. There are numerous differences in legal structures; for instance, advanced funds may be structured as a loan against receivables as collateral or as a direct purchase of receivables in a true sale. Fortunately, many of these differences do not affect cash flow on a routine basis, if at all. What generally matters most is how credit enhancement is achieved in the structure of the transaction. The basic starting point for a structure for credit enhancement is the mechanisms described in *Trade Receivables Criteria* (1999), published by Standard & Poor's. This is a very useful basis for structuring transactions even when the rating agency is Moody's or, in fact, if there is no rating agency involved at all. Adjustments may be made to the final structure for various reasons, but this structure is central to understanding how trade receivables securitizations operate. One of the key aspects of the structure is the concept of the collateralization test.

COLLATERALIZATION TEST

In order to determine whether or not the assets of the SPV are sufficient to support the liabilities of the SPV, a collateralization test must be performed. This test may be applied as infrequently as monthly, or as often as daily.

Understanding this test is crucial to understanding the cash flow of a securitization. Briefly, this test is a direct comparison of the assets of the SPV against the liabilities of the SPV. It is designed to protect the investors' interests and ensure adequate collateral for their investment. If the assets are greater than the liabilities, then the SPV is said to be overcollateralized, and excess cash can be swept to the seller on that day. If the assets are less than the liabilities, then the SPV is said to be undercollateralized, and the seller is not entitled to a sweep of cash. One or even two consecutive business days of undercollateralization may be an occasional occurrence, but undercollat-

eralization extending beyond such brief periods is rare in a normally functioning transaction. Extended periods of undercollateralization are indicative of a serious performance problem in the underlying portfolio of receivables. As such, undercollateralization lasting more than a small number of days is often used as a termination trigger for the deal.

To better understand the collateralization test, we need to examine more closely how the assets and liabilities of the SPV are determined. The assets of the SPV are the net receivables pool balance and any cash held in the SPV. The liabilities of the SPV are the outstanding balance of the note or debt to the investor and the required reserves. This is easily stated but not so easily understood. We will explore these components in greater depth to fully appreciate this test.

NET RECEIVABLES POOL BALANCE

The standard structure starts with the entire outstanding balance of the receivable pool and makes two successive cuts. The first cut eliminates ineligible receivables. The second cut sizes the reserves against the remaining balance.

The terms of the securitization contracts specify exactly which receivables qualify as eligible and which do not. There is plenty of negotiation on this point prior to the deal closing, but any changes after that point are quite rare. The typical contract may include more than a dozen specific criteria for determining if a given receivable is eligible. Fortunately, most of these are nearly automatically satisfied by most receivables. Examples are that the receivable must be generated in the normal course of business, represents a genuine and enforceable debt from an obligor, does not violate any applicable laws, and so on. However, there are usually a number of significant requirements with which not all receivables comply.

Some examples of receivables that may not satisfy all of the *eligibility* requirements are:

- Receivables from obligors in certain countries (in some deals, all export receivables are ineligible).
- Receivables from the federal government.
- Receivables from companies affiliated with the seller.
- Receivables not due within a certain number of days from the creation of the invoice.
- Receivables over a certain number of days past due.
- Receivables that have been written off.
- Receivables from obligors in bankruptcy.

Beyond this, certain types of receivables may be eligible but subject to certain limits. Examples of these may include:

- Receivables from a given obligor may be eligible only up to a certain *concentration* limit.
- Receivables denominated in a foreign currency.
- Receivables from government obligors (other than the federal government).

The exact list of *exclusions* and limits is subject to negotiation prior to deal closing and depends on numerous factors, including the nature of the portfolio, the industry, the rating level sought, and the investor comfort level. Concentration limits may change at any time based on the credit rating or creditworthiness of each specific obligor. Moreover, some transactions permit automatic changes to concentration limits, as frequently as daily. We will return to this topic later in this chapter.

Whatever the structure is, these rules can be enforced as frequently as daily. That is, each day, each receivable is reevaluated to determine if it is eligible. Due to the nature of some of the criteria, some receivables may be ineligible at first and eligible later, or vice versa, most notably depending on concentration levels and limits. In particular, any receivable will eventually become permanently ineligible once it reaches a certain age, be it a certain number of days past due or days past invoice creation. These changing dynamics and associated complexities are in contrast to longer duration assets that have been securitized (that is, mortgages, loans and leases). Depending on the days sales outstanding, the entire portfolio can be changed within weeks or just a few months.

Receivables that are ineligible on any given day are treated as neither assets nor liabilities of the pool. Cash flow from such receivables does continue to flow through the SPV, but the only effect is that any such collections increases the cash held in the SPV, which improves the collateralization level, which in turn generally leads to an immediate or next-day pass-through of those collected funds to the seller.

STANDARD RESERVES

There are four standard reserves. Usually, the reserves of significant concern are the loss and dilution reserves. The other reserves are for yield and fees. Certain transactions may have additional reserves if needed to address additional risks, such as currency risk. We will concern ourselves only with the four standard reserves.

Loss Reserve

There are three components of the *loss* reserve: a stress factor, a sales-based measure of historical loss performance, and the loss horizon ratio. These three components are multiplied together to produce the percentage of eligible outstandings to be reserved as risk protection against losses.

The stress factor is simply a number designed to bring the reserve up to the appropriate ratings standard. Generally, this is 2.0 for an A/A2 rating; 2.25 for AA/Aa2; or 2.5 for AAA/Aaa2. However, these are just guidelines and different stress factors (normally higher) may apply if there are unusual features in the transaction, most notably, risks that may not be adequately captured by the usual formulas.

One noteworthy comment is that the usual stress factors assume that there are some ineligible receivables in the

transaction. The cash flows from these receivables provide some protection for the investor even though they are formulaically given no value. If there is less than the usual contribution of ineligible receivables in the transaction, the stress factor may be increased to compensate. The stress factor is usually fixed for the life of the transaction.

The second component of the loss reserve is the sales-based measure of historical loss performance. To understand this, we first must understand exactly what is considered a “loss.” Each month, losses are considered to be new defaults and new *write-offs*. Any eligible receivable ending the month in a certain age range (the “default bucket”), typically 91 to 120 days past due, is considered to be a new default. The default bucket may be based on days past due or days past invoice creation; and, it may be earlier (e.g., 61 to 90 days) or later (e.g., 121 to 150 days). The exact default bucket is fixed for the life of the transaction and is determined by negotiation but ideally captures a month that exhibits a sharp decline in collections. It is worth noting that this numerical approach to defining a “default” is intended to avoid the inconsistencies that typically exist among sellers as to when and under what circumstances receivables are deemed unlikely to be collected and written off. There are trade-offs in choosing the right default bucket, and some optimization of the loss reserve is possible by choosing the appropriate range. Note that only eligible receivables should be considered. Ineligible receivables are presumed to be of lower quality and are not given explicit value, so there is no need to reserve for their performance.

Once the default bucket is determined, defaults for each month can be tallied. Defaults are the receivables that end a month in the default bucket. Write-offs during the month are added to this number to produce the losses for the month. Note that there should be no overlap in the counting of losses. No receivable should be counted as both a write-off and a default in more than one month. In particular, this means that write-offs of receivables older than the default bucket are immaterial, as these would already have been counted as a loss in some previous month. This is important because most sellers write off receivables much later than the typical default bucket, so, if available data permit, only a small portion of total write-offs need be counted for purposes of the loss reserve.

The losses for each month are divided by sales from several months earlier to produce a default ratio for each month. The idea is to best match up the loss month with the sales from the month in which the newly defaulted receivables were created. For example, if the default bucket were 91 to 120 days past invoice, then sales from three months earlier would be used because the receivables ending the month 91 to 120 days past invoice were created three months earlier (that is, unpaid January sales would end April 91 to 120 days past invoice).

The second component of the loss reserve, then, is simply the highest three-month average default ratio of the last 12 three-month averages. There are several important implications to this formula. First, since three-month averages are used, no single month can cause a disaster. Second, only the highest three-month average is used; so, the other nine months do not affect this component. This

means that this component is typically fairly stable, only changing once or a few times each year. Third, only the most recent 12 three-month averages are calculated, so eventually, older data age out of the calculation window. This means a bad three-month period will eventually age out after a year and thereafter have no effect on the loss reserve.

The third component of the loss reserve is the loss horizon ratio. This is the ratio of sales in the loss horizon (the loss horizon is the number of months in which a receivable remains eligible in the pool, typically four months, although this varies from deal to deal) divided by the outstanding balance of the pool. This ratio accomplishes two things. First, it converts the second component of the loss reserve, which is a sales-based metric, to an outstandings-based metric, which is what the loss reserve needs to be. Second, by using the number of months in the loss horizon, it reserves for the losses embedded in the eligible pool.

Note that as much as a month may be added to the loss horizon to account for the "lookback" in a transaction that is not monitored closely (e.g., settled late in a month against the previous calendar month). This would result in a larger reserve and lower availability. However, this would not apply to a transaction that is monitored on a daily basis.

The loss reserve calculation leads to the trade-off mentioned earlier in determining the appropriate loss horizon. If the default horizon is extended by one month, then a later default bucket will be used, which means fewer defaults and therefore invariably a smaller second component of the loss reserve. It also enables the loss horizon to be similarly extended, which brings more receivables into the eligible pool. However, this also requires the loss horizon ratio to reflect an additional month of sales in the numerator, effectively reserving for an extra month of losses. Due to this trade-off, it is not possible to determine an appropriate default horizon without actually doing the math to determine an optimal solution. Note that the optimal quantitative solution may not turn out to be accepted or agreed to by all parties; there may be qualitative considerations as well, such as industry standards and disaster scenario risks.

Note also that the loss horizon and the default horizon, while often equal, are not necessarily identical. The default horizon is the period before a receivable is considered to be defaulted; the loss horizon is the period before a receivable drops out of the eligible pool. A deal might permit a receivable to remain in the eligible pool for only three months, but not be considered a default until it has aged four months, for instance.

The loss horizon ratio will vary somewhat from month to month, which will cause some, usually minor, fluctuation in the loss reserve percentage each month. Over time, though, the loss reserve ratio will stay in a narrow range unless collections patterns change, typically evidenced by changing days sales outstanding and/or delinquency levels.

These changes can sometimes lead to counterintuitive results. For instance, if days sales outstanding improve due to improved collections, the sales remain the same

but outstanding balances fall. This produces a larger loss horizon ratio, which in turn produces a larger loss reserve percentage. The reason is that the losses embedded in the pool may not have shrunk (collections might simply have accelerated on good, paying accounts, rather than by collecting on nonpaying accounts) while the pool has shrunk, thus the need to reserve a higher percentage of the smaller pool to maintain the same level of loss protection in terms of absolute dollars.

Fortunately, in the long run, fairness usually wins out, as improved collections usually results in a decline in defaults and, therefore, a smaller second component of the loss reserve. So, eventually, the loss reserve will be reduced, rewarding improved collections, albeit only once consistency has been demonstrated.

Generally, the best way to reduce the loss reserve over time is to consistently collect well. It may be beneficial to place extra emphasis on collecting receivables in the default bucket right before the end of each month. However, such an emphasis may already be in place, which indeed may be the basis for choosing the default bucket in the first place.

It is possible to get too clever in trying to manage the reserves. For example, just as improved collections can increase the loss horizon ratio, slowing collections can decrease the loss horizon ratio, which may lead to a lower loss reserve. However, slower collections invariably lead to an increase in defaults, which will quickly cancel out any benefit of a reduced loss horizon ratio. If it were possible to delay collections of receivables within the default horizon without actually increasing defaults, this would theoretically lead to a lower reserve. However, this type of cleverness is playing with fire, not to mention unethical, and any attempt to improve availability under a securitization program by such manipulations risks undermining the quality of the underlying receivables pool.

Trade Credit Insurance

One way to substantially mitigate or entirely replace the loss reserve is with trade credit insurance. Such insurance pays off when there is a default on a receivable. If the securitization is the beneficiary of such a policy, a substantial portion of losses is replaced with paid claims. The need for a loss reserve is thus substantially lower. Of course, such insurance must be paid for with premiums, and a reserve must be created to ensure that premiums will continue to be paid during a termination scenario.

Many commercially available trade credit insurance policies are not sufficiently clear and binding on the insurance provider to meet the satisfaction of the rating agencies. However, policies structured with an adequate elimination of undue conditionalities do exist and can be of great value in a securitization. They are particularly useful if there are substantial obligors in non-OECD (Organisation of Economic Co-operation and Development) nations, high obligor concentrations, or if many obligors have a pattern of reliable but very slow payment. Another useful application of trade credit insurance is with respect to sellers trying to achieve deconsolidation

treatment under IFRS accounting. Since risk transference is an important element in determining the appropriateness and extent of deconsolidation, properly structured trade credit insurance can facilitate the desired outcome.

Trade credit insurance is not required for every deal, but it is usually well worth considering, and may make sense unless the loss reserve without insurance is already satisfactory.

Dilution Reserve

The dilution reserve is sized in a manner similar to the loss reserve, but there are several important differences. There are three components of the dilution reserve: a stress factor, a sales-based measure of historical dilution performance, and the dilution horizon ratio. These three components are multiplied together to produce the percentage of eligible outstandings to be reserved as risk protection for dilutions, but a volatility component is added into the formula to further protect the investor against uncertainty in dilution performance.

First, again, we must determine exactly what does and does not constitute *dilution*. At first glance, dilution is all noncash reductions in the balance of an invoice that would not fall under the category of "loss." This would include such impairments as damaged goods; short, delayed, or otherwise incorrect shipments; and pricing errors. However, not all credits are necessarily dilution. In decreasing order of investor risk, the three categories are: variable dilution, contractual dilution, and nondilutive credits.

The examples mentioned above are all variable dilution, representing the greatest risk to an investor. Such dilution is of great concern to an investor, not only because the amounts are not entirely predictable up front, but also because any of a number of worst-case termination scenarios may involve a significant increase in this type of dilution due to quality issues or more aggressive postsale negotiations by obligors.

Contractual dilution is essentially any reduction in the expected payment of a receivable that is known or contractually limited at the time the invoice is created (or, more precisely, at the time the invoice is transferred into the transaction). Examples include volume discounts, good customer credits, or discounts for timely payment. Strictly speaking, discounts for timely payment expire after a certain number of days, say, at 15 days past due; however, in most industries, customers often take the discount regardless of when payment is made, and so this amounts to a simple credit.

Contractual dilution can generally be handled simply by reducing the value of an invoice up front. For example, a \$100 invoice with a 2% discount for timely payment can be treated simply as a \$98 invoice with no discount. We shall see later in this discussion that this is more favorable than treating the receivable as being \$100 with \$2 of dilution. Thus, it can be very important to identify all manner of credits known at the time the invoice is created. Other forms of contractual dilution not exactly quantifiable up front may be handled with a simple reserve based on the 12-month average of actual contractual dilutions taken.

This might be more appropriate for credits given when an obligor reaches certain volume thresholds. These credits are contractually limited, but often the information is not readily available in order to reserve for them up front, unless considerable additional information is tracked regarding sales history and volume discount agreements.

The last category of credits covers nondilutive credits. These concern the way some industries may handle transfers, corrections to invoices, or progressive billing. In a transfer, a receivable might have been initially assigned to the incorrect obligor or branch. A credit would be issued to reverse that invoice and a "new" invoice immediately issued to the correct obligor. From a business and legal perspective, this is a nonevent because the correct obligor was always legally liable for the full amount eventually invoiced, regardless of how this was tracked in the seller's receivables system. Consequently, the credit is considered nondilutive (and the "new" invoice is not considered a sale).

Similarly, if there are several adjustments to an invoice, a seller may choose to simply credit the entire original invoice and rebill a new, corrected one. The amount of variable dilution is equal to the reduction (if any) from the original invoice to the replacement invoice, not the entire original invoice. For example, if a \$100 invoice is canceled and replaced with a \$95 invoice to the same obligor, there is only \$5 of variable dilution, not \$100; the remaining \$95 of the credit is nondilutive. Another example is where a \$100 invoice might be credited and replaced with a fresh \$200 invoice, representing progressive work completed on a construction project. In this case, there is no variable dilution at all, despite the \$100 credit; it is entirely nondilutive. Similarly, there is only \$100 of additional sales, not \$200. Clearly, if such cases are not identified and quantified (which may involve considerable effort), the amount of variable dilution, and therefore the dilution reserve, can be greatly oversized.

Not all receivables are at risk of dilution. In most industries, if a dilution is going to occur, it will generally occur within the first month or so after an invoice is issued. This is because pricing errors and incorrect shipments are usually discovered quickly. The dilution horizon is a measure of the time window during which a receivable is at risk of dilution. The dilution horizon is determined by examining the time between the creation of an invoice and the application/linking of any corresponding credit. Specifically, the dollar-weighted average is used. Often, it is not feasible to get a complete picture for this metric for every single invoice, because many sellers do not explicitly tie credits to the original invoices. Instead, they might be tied to later invoices that the obligor has chosen to offset. If this is the case, a suitable random sample of credits can be used. The dilution horizon will often be one or two months.

Dilution ratios are determined in a similar manner to loss ratios. For each month, the total dilution amount is divided by the sales from one or two months earlier (the offset number of months is equal to the dilution horizon). A simple average of the last 12 dilution ratios is used as the core component of the sales-based performance measure. To this, a volatility component is added. This in turn is based on both the average and the peak of the last

12 dilution ratios. The specific formula for the volatility component is:

$$(\text{Max}_{12}(\text{DR}) - \text{Avg}_{12}(\text{DR})) \times (\text{Max}_{12}(\text{DR})/\text{Avg}_{12}(\text{DR}))$$

where

$\text{Max}_{12}(\text{DR})$ is the largest of the last 12 dilution ratios and $\text{Avg}_{12}(\text{DR})$ is the average of the last 12 dilution ratios.

In other words, it is the difference from peak to average times the ratio of peak to average.

The entire formula for the dilution reserve is:

$$[(\text{Avg}_{12}(\text{DR}) \times \text{SF}) + \text{DVC}] \times \text{DHR}$$

where

$\text{Avg}_{12}(\text{DR})$ is the average of the last 12 dilution ratios;

SF is the stress factor, typically 2.0 for a single-A rated transaction; DVC is the dilution volatility component; and

DHR is the dilution horizon ratio, defined as sales from the last one or two months (depending on the dilution horizon) divided by current outstandings.

Note that, while there is some smoothing by using a 12-month average, there is also a punitive component for the volatility, through the use of the worst of the last 12 dilution ratios. This appears in both the difference ($\text{Max}_{12}(\text{DR}) - \text{Avg}_{12}(\text{DR})$) as well as the ratio ($\text{Max}_{12}(\text{DR})/\text{Avg}_{12}(\text{DR})$). Since these terms are multiplied, a single bad month can lead to a quadratic increase in the size of the dilution reserve. Thus, the formula reflects the investor's strong desire for stable and unsurprising dilutions from month to month.

Note also that the stress factor used here need not be the same stress factor as was used in the loss reserve formula, though usually they are indeed the same. These stress factors are often adjusted to cater to specific qualitative concerns that the rating agencies might feel are not adequately captured by the formulas.

Finally, note that the formula rewards quick identification of any dilution. The idea is that if dilution is typically recognized within one month from the creation of an invoice, then, on average, the portion of the eligible pool over one month aged is free from dilution, and there is no need to reserve for dilution past the first month.

As for managing the dilution reserve, the best ways to keep this reserve under control are to have stable policies and practices to keep the monthly variance to a minimum, and to make careful use of reason codes to support characterizing credits as contractual or nondilutive wherever appropriate. In the absence of such information, credits are conservatively assumed to be variable dilution.

The importance of stable policies is apparent when the formula for the volatility component of the dilution reserve is considered. The peak month dilution ratio appears both in the difference and in the ratio, which are then multiplied together. This means that a single bad month has a quadratic effect on the size of the dilution reserve. It is therefore very important to avoid having single months of exceptionally high dilution.

Some business practices to avoid include delaying the issuance of credit memos and then playing "catch-up."

In some instances we have observed sellers cleaning up outstanding disputes at the end of each quarter, or even worse, annually at year-end. This type of business practice can lead to unnecessarily reduced liquidity as a result of an unduly large dilution reserve. It is much better to issue credit as soon as practical, to keep things steady. This also helps to keep the dilution horizon low. It is also better to price accurately up front. To the extent that contractual discounts are readily determined, higher gross sales prices are fine. However, if higher prices are designed to cover expected variable dilution, this is a problem. It is better to clamp down on customer claims of variable dilution, even if this is in exchange for lower prices up front.

Contra accounts can also lead to dilution issues. A contra account is a customer who is also a supplier and therefore has potentially offsetting payables. The ideal way to handle this is with a contract that explicitly bars the offsetting of payables against receivables; that is, both must be separately paid. Unfortunately, this is not often practical. To the extent that a payable can be used to offset a receivable, this undermines the collateral value of such a receivable, and therefore it is best to avoid funding such receivables, thereby avoiding investor exposure to potential dilution.

To the extent that nondilutive credits are used, particularly cancel/rebills, it is imperative that sufficiently detailed data are captured so that it is clear how such credits relate to invoices, so that the proper netting can be done. If this is not possible, it is generally required to assume that the credits are variable dilution. Of course, some of these issues can be avoided entirely; cancel/rebills can be avoided, and simple credit or debit memos can be used to record any net change.

There are numerous other areas that may depend on practices particular to an industry, seller, or receivables platform. Only a careful examination of the nature of credit can reveal ways to control and minimize the dilution reserve.

Dynamic and Static Reserves

The dynamic reserve is simply the sum of the loss and dilution reserves. This is usually the main reserve used to determine the value of eligible receivables.

However, while investors are receptive to lower reserves (and higher availability) given improved loss and dilution performance, they nevertheless prefer to see certain further protections in place. Thus, the loss and dilution reserves cannot fall below a static reserve regardless of dynamic performance.

The standard approach to setting the reserve floor is to add a component reflecting obligor concentration to a component reflecting dilution. This sum might lead to a percentage that is fixed for the life of the deal, or modified monthly, or even daily. On each day, the dynamic reserve is compared to the static reserve, and whichever is greater is used.

The concentration component of the static reserve is typically four times the concentration limit of unrated or non-investment-grade obligors. For instance, if such obligors are limited to 5% of the pool, the concentration component

would be 20%. So, regardless of dynamic loss and dilution performance, the investor remains protected against the bankruptcy of the four largest obligors. The exact formula depends on the rating level sought, but generally, stronger credit obligors can be granted higher concentration limits without affecting the concentration component. The four times multiple is generally applicable for structures intended to achieve A/A2 ratings.

The dilution component of the static reserve is simply the 12-month average dilution ratio times the dilution horizon ratio. This is usually a rather small number and the concentration component is the driving force in the static reserve.

Now the implications of choosing concentration limits can be seen and the merits of changing concentration limits on a daily basis can be best understood. Higher concentration limits obviously bring more receivables into the eligible pool, but they also increase the static reserve, which may result in a lower advance rate. The concentration limit that optimizes availability may not be immediately obvious and, moreover, may change on a daily basis as actual obligor concentrations change.

If the entire portfolio is tracked on a daily basis, the bond administrator can determine this optimal level on a daily basis, and investors are generally comfortable with rewarding a more diversified obligor pool with a lower static reserve. This is especially important if certain large obligors tend to place large orders at one time of the month and/or make bulk payments at another time of the month.

Yield and Fee Reserves

The last of the standard reserves are the reserves for yield and fees. In a termination scenario, the receivables in the pool wind down and the cash flow generated is used to pay off the investor (with any excess amounts going to the seller). During this time, interest on the outstanding liability amount must still be paid along with fees to various parties, such as the servicer, bond administrator, trustee, and the like, to ensure that the transaction continues to be administered properly until the investor is paid off.

Consequently, an amount of receivables is set aside to cover the expenses expected to be owed from the time of termination until all receivables have either paid down or defaulted. If receivables are considered defaulted after four months, then the reserves would be sized to handle four months of interest and fee payments.

Note that these expenses during termination might be higher than during the usual, revolving period. For instance, if the interest rate is based on an index, the index might be assumed to be higher during termination.

In some cases, a further cash reserve may be set aside for actual expenses due within the month.

FUNDING MECHANICS

Now that we know how receivables are valued in a securitization, we can see how funding is achieved on a daily basis. At the start of a deal, the seller acquires investor

funds based on the value of the eligible receivables net of the reserves. The collateralization test is run to ensure that the investor is adequately protected.

The next day, based on the latest information regarding collections, cash applications, sales, dilutions, write-offs, and defaults, the collateralization test is run again, and a new funding level is determined. Usually, the main modifiers are new collections and sales, and, therefore, the overcollateralization of the deal permits additional funds to be swept to the seller.

However, on some days, dilutions, write-offs, cash applications, and defaults may exceed collections and sales. In such cases, the deal temporarily becomes undercollateralized and no funds are swept to the seller. As mentioned above, this is not uncommon, but rarely lasts more than a day or two.

As a result, the daily cash flow under a securitization is not unlike the daily cash flow absent a securitization. All things being equal, collections flow through on a daily basis. The additional wrinkle is that new sales, cash applications, dilutions, write-offs, and defaults also have an immediate impact on cash flow. Typically, though, over a period of just a few days, these tend to cancel out.

Some securitizations use weekly or even monthly fundings. In such cases, collections are generally trapped until the next scheduled funding date, thus reducing availability in the interim. If the seller is a sufficiently strong credit, it might be possible for the interim collections to directly flow through, and the weekly or monthly fundings being more of a "true-up" than an actual funding.

MONTHLY SETTLEMENTS

Interest and fees are generally paid each month on the settlement date. Typically, two days in advance of each settlement date, a monthly report is distributed detailing not only the portfolio status, but also the interest and fee payments expected to be distributed on the settlement date. These amounts are then paid directly out of the funds in the securitization (not from the seller). Having said that, this then results in correspondingly less cash available to be swept to the seller. If a cash reserve is being used, any remaining amounts may be released or refilled for payments in the next month.

Also on the settlement date, the new reserve percentages are applied. Since the loss and dilution reserves are based on moving averages, each month provides new data to adjust these measures. These are gathered at the end of the month, analyzed and reported in the monthly reports, and enforced on the settlement date. This may result in an increase or decrease in availability depending on the loss and dilution performance in the most recent month. Note that the loss and dilution reserve percentages change on a monthly basis, but these percentages are enforced daily against the evolving portfolio of eligible receivables.

SUMMARY

Funding against receivables is based on the collateral value of the outstanding pool. This, in turn, is based on

the composition of the outstanding receivables and the historical performance of the receivables pool. It has been our experience that advance rates have ranged from as low as 50% to as high as 90%, depending on the characteristics of the receivables and the existence, if any, of incremental credit enhancements incorporated into the securitization. Advance amounts can be increased through the sale of a subordinate tranche, possibly unrated or with a rating level lower than the senior tranche. Such subordinate tranches would typically be less liquid, less certain to pay in full and thus priced at higher yields. The extent to which a seller wants to maximize liquidity versus minimize all-in cost will influence any decision to sell a subordinate tranche. Understanding the deal structure and how historical performance affects collateral valuation are the keys to understanding the flow of cash under a receivables securitization.

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