

The True Face of Dilution

Field examiners often spend considerable time diligently scrubbing a borrower's trade account receivables ("A/R") by performing, amongst other procedures, confirmations, testing of invoices, shipping, credit note, partial payments and review of customer agreements and analysis of accounting reserves. These procedures lead to the formulation of a list of potential Borrowing Base ("Bbase") ineligible for the Lender. More often than not, the proposed ineligible items are met with some skepticism and the following question "Aren't these all covered by dilution?" The question may come from a borrower concerned with Bbase availability or an account manager concerned over the impact on a relationship and/or a deal closing. Regardless of the motivation, the answer is critical to ensuring that the Bbase is formulated to adequately protect an asset-based lender's interest.

The Basics

Prior to answering the question, it would be useful to review the mechanics of an A/R Bbase.

A Bbase is simply a calculation that determines the amount that an asset-based lender is willing to lend to a specific borrower. The Bbase utilizes a borrower's financial information to estimate the realizable value of its collateral in a liquidation scenario. Asset-based lenders rely on two metrics to estimate the A/R liquidation value, namely ineligible items and dilution.

A/R ineligible items represent specific items that an asset-based lender does not wish to lend against due to their associated credit risk. The more common ineligible items include A/R aged greater than 90 days past invoice date, foreign receivables, contra accounts, and disputes.

The following table reflects a typical A/R Bbase net of ineligible items:

<u>A/R Bbase</u>	
A/R Aging	\$ 200
<u>Ineligibles</u>	
> 90 days old	(30)
Foreign	(10)
Disputes	(20)
Total ineligible items	<u>(60)</u>
Eligible A/R	<u>\$ 140</u>

The second metric utilized by the asset-based lender to estimate liquidation value is dilution. Dilution measures the risk associated with the collection of A/R. A dilution analysis attempts to estimate the ultimate collection for every dollar of A/R on the books. The analysis will consider various dilutive elements including credit notes (for returns, errors, damages, etc.), write-offs (i.e. for bad debt), payment discounts, as well as customer rebates and allowances. Dilution is impacted by a company's trade policies, credit and collection procedures, as well as its customers' financial health and is usually expressed as a percentage of sales (dilution rate) with the most common method of calculation as follows:

$$\text{Dilution Rate} = \text{Dilution} / \text{Gross Sales for trailing twelve month period}$$

Examples of dilutive elements as well as a calculation of the annual dilution rate are presented in the following table:

Annual Sales, Dilution & Dilution Rate	
Gross Sales - A	\$200
<u>Dilution</u>	
Returns	4
Billing errors	1
Damages	2
Discounts	1
Rebates	3
Write-offs	1
Total Dilution - B	12
Dilution Rate - B/A	6%

Dilution is critical in evaluating A/R over an extended time period and is an essential metric for asset-based lenders. One of the common methods for calculating the Bbase A/R advance rate takes into account dilution as follows:

$$\text{Bbase A/R advance rate} = 100\% - (2 \times \text{Dilution Rate}) - 5\%$$

Based on the above example, a company with a dilution rate of 6% would have a Bbase A/R advance rate of 83%. In doubling the historical dilution and adding a further 5%, the advance rate is meant to provide a “cushion” to a lender to protect against the higher collection risk. In a liquidation scenario collections are more problematic when a company ceases operations as certain customers demand proof for all shipments, exaggerate disputes, claim damages, etc.

While there are numerous methods of estimating dilution and setting advance rates, we have focused on the more common method outlined above. Accordingly, a typical A/R Bbase for a Company with a 6% dilution could be as follows:

A/R Bbase	
A/R Aging	\$ 200
<u>Ineligibles</u>	
> 90 days old	(30)
Foreign	(10)
Disputes	(20)
Total ineligibles	(60)
Eligible A/R	140
Advance Rate	83%
Available A/R	\$ 116

Aren't we double counting?

A frequently asked question is “Why do I need all these ineligibles if I am factoring in dilution?”. At this point we need to take a step back and consider the purpose of advance rates and ineligibles. Ineligibles are meant to exclude receivables whose collection is doubtful or problematic. Once the “ineligible receivables” have been removed, the advance rate then estimates how much of the “eligible receivables” could be collected in a liquidation scenario. Put simply, ineligibles get rid of the bad receivables while the advance rate estimates how much of the good receivables could turn bad in the future.

While the above is a useful starting point, it leaves a field examiner and account manager with the following question: How does one identify the pool of eligible receivables and ensure that the ineligible established have not already been addressed by dilution (i.e. the advance rate)?

Breaking down dilution

The key to answering this question understands how the dilution calculation works. The dilution rate is calculated based on a historical average which is then applied to the A/R at a point in time to estimate collectability. Accordingly, if 5% of yearly gross sales were dilutive, A/R is assumed to also be 5% dilutive.

This logic only holds if the composition of sales and A/R are equivalent. However “the issuance of credit notes and the write-off of uncollectable accounts often lag the collection of “good” receivables. The end result is that the dilution level in A/R is often significantly higher than the dilution rate determined on sales. The following example illustrates this point:

Example 1

A company generates \$100 of sales per month which are collected 31 days after invoice date. The 31 days is considered the “collection period”. The Company has returns of 5% of gross sales each month (“dilution rate”), which are recorded as credit notes 61 days after the invoice date (“credit lag”). An A/R aging and effective dilution based on the above assumptions is as follows.

	Total	Days Past Sales (Invoice Date)			
		0-30	31-60	61-90	>90
A/R	\$ 105	\$ 100	\$ 5	\$ -	\$ -
Unrecorded dilution	10	5	5	0	0
Expected Dilution %	9.5%	5.0%	100.0%	0.0%	0.0%

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Sales made in the current month are fully reflected in the 0-30 day column of the A/R aging and would include \$5 of future dilution (5% dilution factor).

Sales made 31 to 60 days ago (refer to the 31-60 day column above) would have been collected as customers pay in 31 days however as the related credit notes are only issued after 61 days, the 31-60 day aging column would still contain a \$5 balance which is uncollectible (i.e. 100% dilutive). This additional dilution is the result of the credit lag.

Accordingly, while the dilution rate is 5% of gross sales, the effective dilution rate on A/R is 9.5% (nearly double the dilution rate!).

Example 2

In the above scenario, the gap in dilution due to credit lag is further amplified if the credit notes were only processed in 91 days versus 61 days, as noted in the following example:

A/R Aging and Unrecorded Dilution					
	Total	Days Past Sales (Invoice Date)			
		0-30	31-60	61-90	>90
A/R	\$ 110	\$ 100	\$ 5	\$ 5	\$ -
Unrecorded dilution	15	5	5	5	0
Expected Dilution %	13.6%	5.0%	100.0%	100.0%	0.0%

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Dilution Rate

In the above scenario, the dilution rate on sales remains at 5%, however the effective dilution rate on A/R increases to 13.6% (almost triple the sales dilution rate!).

While most situations involve the collection of A/R prior to the processing of credit notes, there are rare occasions when credit notes are recorded in advance of collections (i.e. extended payment terms). In these situations the sales dilution rate would overstate the effective level of dilution in A/R.

The dilution cushion

While the examples above demonstrate that the annual dilution rate is not always an effective measure of dilution in A/R, lenders typically take comfort in the fact that the Bbase advance rate often doubles the dilution rate and includes a further 5% “cushion”.

While this may be valid, use of the “cushion” to provide a buffer for credit lag leaves less room for unforeseen contingencies that could occur in a liquidation scenario. In addition a company could inflate Bbase collateral simply by reducing the timeliness of credit note processing accordingly, the “cushion” may not really exist.

A Simple Rule of Thumb for Credit Lag

A simple but often effective rule of thumb for adjusting dilution to account for credit lag is as follows:

$$\text{Average Credit lag in days} / \text{Average Collection time in days} * \text{Dilution rate} = \text{Effective Dilution on A/R}$$

Utilizing this rule of thumb, the effective dilution rate in examples 1 and 2 would be as follows:

$$\text{Example 1: } 61/31 * 5\% = 9.8\%$$

$$\text{Example 2: } 91/31 * 5\% = 14.7\%$$

While this simple rule of thumb results in a better approximation of the actual dilution, it is not a mathematical proof and may not apply in all instances.

The outline to date leads to our first rule of dilution: **If the credit lag is greater than the collection period, the effective A/R dilution will be greater than dilution based on gross sales.**

But where can evidence of this additional exposure for dilution be found in a company's accounting records and what techniques are available to quantify it?

Chargeback, Debit memos and Partial Payments

When a field examiner reviews the A/R aging of a borrower she/he will often encounter chargebacks, debit memos, and/or partially paid invoices. Customers may short pay an invoice due to a return, dispute, or an inability to pay. For example a customer might owe a company \$100 for an invoice but pays only \$95. The company then has two options; remove the \$100 invoice from the A/R aging and record the remaining \$5 as a debit memo or a chargeback or leave the invoice on the A/R aging at a reduced balance of \$5. In either case the field examiner has a dilemma. Should the unpaid balance of \$5 be held ineligible or is it already captured by dilution?

Remember the \$5 represents a residual unpaid balance that is potentially 100% dilutive. The customer has already paid the portion it agrees with or is able to pay. As a result these items represent dilution over and above the dilution rate and should be held ineligible on the Bbase.

Accounting Reserves

That \$10 of unrecorded dilution found in the 31-60 and 61-90 day columns in Example 2 could also be identified in an accounting reserve.

One reason that credit lag is longer than the collection period is that credit notes must be validated and approved before being granted. However some companies take a proactive approach to dealing with credit lag by recording the request for a credit in a separate accounting reserve. The liability for the unprocessed credit note would be included in this reserve until support has been received / validated and the credit note has been processed. As this accounting reserve represents invoices that are potentially 100% dilutive, it should be held ineligible on the Bbase.

Holding Bbase ineligible for partial payments and/or unissued credit notes does not eliminate dilution. A prudent asset-based lender still expects that the borrower's eligible receivables would be subject to dilution (estimated by the annual dilution rate). However these ineligibles help reduce a Bbase exposure for credit lag.

Rule #2: Debit memos, charge backs, partially paid invoices, and reserves for unrecorded credit notes should be held ineligible on the Bbase.

Quantifying Credit Lag on the Bbase

Companies do not always identify partial payments on the AR aging, nor do they necessarily establish an accounting reserve for unrecorded credit notes. In addition, these ineligible may not capture the full impact of credit lag. For example customers may be slow in requesting credits from the Company. As a result, field examiners must fall back on an independent measure to assess the impact of credit lag on the Bbase.

The credit lag test typically consists of analyzing a sample of credit notes over the dilution period. The examiner reviews source documents to assess the reason for the credit note and how long it took from the date of the sale to record the credit note ("Credit Lag"). The impact of credit lag on the Bbase is usually calculated as follows:

Bbase exposure for credit lag = average credit notes processed per day X credit lag in days

For example if the sample of credit notes indicated that it took an average of 60 days from the invoice date to issue a credit note and average credit notes per day over the period tested was \$10K, the Bbase impact of unissued credit notes would be estimated at \$600K. Again the field examiner is faced with a

question. How much of this \$600K is already included in dilution rate (i.e. advance rate)? After all one purpose of the advance rate is to estimate the loss in A/R due to future credit notes.

In Example #2, the company processed \$5 of credit notes per month and had a credit lag of 91 days. Using the above formula results in the following Bbase exposure for credit lag:

$$\text{\$5 (credit notes per month) / 30 (days per month) * 91 (days credit lag) = \$15}$$

The exposure for credit lag is exactly equal to the unrecorded dilution of \$15 in Example #2. But, as previously stated, some of that dilution is already captured by the annual dilution rate and needs to be stripped out of the ineligible.

Remembering rule #1 (If the credit lag is greater than the collection period, effective dilution will be greater than the dilution rate), the solution presents itself. The portion of credit lag that is greater than the collection period needs to be isolated in the formula as follows:

$$\text{Bbase ineligible for credit lag = average credit notes per day X (credit lag in days – average collection period in days)}$$

Returning again to Example #2 the ineligible would be:

$$\text{\$5(credit notes per month) / 30 (days per month) * (91 [days credit lag] – 31 [average collection period]) = \$10.}$$

The ineligible calculated of \$10 equals the unrecorded dilution of \$10 that is not captured by the annual dilution rate, as shown in Example #2. This establishes the third rule of dilution.

Rule #3: A Bbase ineligible should be calculated based on the difference between the credit lag and collection period.

Double counting

If a Bbase ineligible for credit lag is calculated, why are ineligible for partially paid invoices and unprocessed credit notes required? If rule #2 and rule #3 are both designed to identify ineligible for unrecorded dilution, ineligible may be double counted.

For the conservative lender this may not be an issue. However for those that want to hold all identified dilutive items from the Bbase without overlapping, there is a solution. Hold all identifiable partial payments and reserves for credit notes as ineligible on the Bbase but reduce the credit lag ineligible.

The reduction in the credit lag ineligible is accomplished by changing how the credit lag is calculated. The date that the credit note is recorded would be replaced with the date the receivable is first held ineligible on the Bbase (i.e. when the invoice is first reclassified as a charge backs, debit memo, or included in an accounting reserve).

For example if a credit note was issued 60 days after the invoice date but an accounting reserve was set up 45 days after the invoice date, the credit lag ineligible would be based on a lag of 45 days. In this manner all known potentially dilutive items are held ineligible on the Bbase, along with an adjusted credit lag ineligible.

Based on the above, rule #3 should be modified to say:

Rule #3 A BBC ineligible should be calculated based on the difference between the credit lag and collection period. Where possible, the credit lag should be based on the date when the related amount is first held ineligible on the BBC.

Bbase credit lag ineligible = average credit notes per day X [credit lag in days (based on date recorded as Bbase ineligible) – average collection period]

The final part of this article examines some special cases.

Is there a limit to the lag?

The previous article demonstrated that the credit lag ineligible should be based on the date when the receivable is first recorded as ineligible on the Bbase. This rule effectively placed a limit on the Bbase exposure for credit lag/unrecorded dilution.

Example 3

A company may only perform an annual clean-up of its A/R. Assume a company has sales of \$100 per month, collections in 31 days, and dilution is comprised of customer rebates of 5% of gross sales. Customers make payments against invoices, net of the rebate and the company writes off the residual A/R balance once per year. If the credit notes for rebate are recorded annually in June, what would the company's A/R aging and effective dilution be in the month of May (one month prior to the annual clean up)?

A/R Aging and Unrecorded Dilution					
May 28		Days Past Sales (Invoice Date)			
	Total	0-30	31-60	61-90	>90
A/R	\$ 150	\$ 100	\$ 5	\$ 5	\$ 40
Unrecorded dilution	55	5	5	5	40
Expected Dilution %	36.7%	5.0%	100.0%	100.0%	100.0%

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Each column above contains \$5 of unrecorded dilution for sales rebates (the 90+ column contains 8 months). As customers pay in 31 days, only the 0-30 day column has collectible A/R, resulting in an effective dilution of 36.7%.

This last example is not entirely accurate as most Bbases already hold all accounts over 90 days past invoice date ineligible. Credit notes and write-offs are effectively recorded on the Bbase on day 91. Accordingly the above example should be reframed as follows:

Example 4

A/R Aging and Unrecorded Dilution					
May 28	Total	Days Past Sales (Invoice Date)			
		0-30	31-60	61-90	>90
A/R	\$ 150	\$ 100	\$ 5	\$ 5	\$ 40
Ineligibles	(40)	-	-	-	(40)
Eligible A/R	110	100	5	5	-
Unrecorded dilution	15	5	5	5	-
Expected Dilution %	13.6%	5.0%	100.0%	100.0%	0.0%

Included
in
Dilution
Rate

Not Included in
Dilution Rate

While effective dilution, at 13.6%, is still higher than the annual dilution rate of 5%, this example makes it clear that there is a limit to the Bbase exposure posed by credit lag. Returning to the formula for the credit lag ineligible, developed in part 2 of this series:

$$\text{Bbase credit lag ineligible} = \text{average credit notes per day} \times [\text{credit lag in days (based on date recorded as Bbase eligible)} - \text{average collection period}]$$

If the Bbase holds invoices greater than 90 days ineligible, then the credit lag in the above formula should not be greater than 90 days.

Rebates part 2

Now that a limit to the Bbase exposure to credit lag has been established, it is time to start tearing it down. What happens when a customer requests a credit on an invoice that has already been paid? The credit could be offset against a current receivable leading to additional dilution.

Example 5

In the previous example, customers paid the net balance after rebates were deducted. The next example assumes that customers pay the gross invoice and rebates are cleared annually through a reduction of current receivables. The company's A/R aging and effective dilution in the month of May, one month prior to the annual clean up, would be as follows.

A/R Aging and Unrecorded Dilution					
May 28	Total	Days Past Sales (Invoice Date)			
		0-30	31-60	61-90	>90
A/R	\$ 100	\$ 100	\$ -	\$ -	\$ -
Unrecorded dilution	55	5	5	5	40
Expected Dilution %	55.0%	5.0%	N/A	N/A	N/A

Included
in
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Not Included in Dilution Rate

No receivables are aged over 30 days as customers pay the gross balance due in 31 days. As payments are not reduced for sales rebates, customers are in effect overpaying during the year and receiving a refund on annual basis through a reduction in current receivables. In the month prior to the granting of the rebates, customers would be owed 11 months of rebates or \$55 (11 months *\$100 sales/month*5% rebate), resulting in effective dilution on A/R of 55%. This example highlights the fact that no formula, no matter how sophisticated, can replace a proper understanding of a company's business when assessing its collateral. With respect to dilution, understanding the nature and timing of the various types of credit notes recorded is critical.

Season's greetings

The examples in the series to date assumed that sales were constant throughout the year. What happens if a company has significant seasonality in sales?

Example 6

Assume a dilution rate of 5%, a collection period of 31 days, and a credit lag of 61 days. Sales are \$500 in December and \$100 per month for the remainder of the year. What would the A/R aging and effective dilution be at the end of January?

A/R Aging and Unrecorded Dilution		Days Past Sales (Invoice Date)				
		Total	0-30	31-60	61-90	>90
January 31						
A/R	\$ 125	\$ 100	\$ 25	\$ -	\$ -	
Unrecorded dilution	30	5	25	-	-	
Expected Dilution %	24.0%	5.0%	100.0%	0.0%	0.0%	

Included
in
Dilution
Rate

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The 0-30 day column equals invoicing for January of \$100 and includes \$5 of expected returns/dilution. December sales of \$500 have already been collected, leaving only the unrecorded credit notes of \$25 (\$500 X 5%) in the 31-60 day column. While the annual dilution rate is 5% of gross sales, the effective dilution is 24%. This example demonstrates that seasonally adjusted advance rates or Bbase ineligible may be required, especially in the months following peak seasonal sales. The above example also reinforces the need to hold all potentially dilutive items (unprocessed credit notes and charge backs) as separate ineligible on the Bbase.

Reserve, reserve, reserve

A one size fits all formula for annual dilution or credit lag ineligible will never adequately address every variation in seasonality, allowances, rebates, discounts, and credit note recording processes. Specific accounting reserves for returns and rebates that take into account seasonality, sales volume, and timing of recording credit notes will often be more accurate than a formula or an ineligible based on a sample of credit notes. Loan agreements often state that financial figures on the Bbase must be in accordance with GAAP and this covenant should be enforced vigorously. A company with an asset-based loan should not be allowed to follow the routine of calculating A/R accounting reserves for year-end purposes only.

Systematic and rational accounting reserves for dilution should be validated by the field examiner and included as ineligible on the Bbase. These ineligible may need to be grossed up if a greater reserve could be required in a liquidation.

If an accounting reserve, held ineligible on the Bbase, adequately addresses a certain class of credit notes, then the annual dilution rate should be reduced. For example, assume a Company had a reliable accounting reserve for sales rebates held ineligible on the Bbase and had an annual dilution of 8%, of which 3% relates to sales rebates. To avoid any double counting, dilution for advance rate calculation purposes would be 5% (8% less the 3% for sales rebates). The 3% of rebate credit notes would be treated as non-dilutive. In addition the *average credit notes per day* in the formula used to calculate the credit lag ineligible would also be reduced by these non-dilutive credits.

Rule #4 Include all systematic and rational A/R accounting reserves as BBC ineligibles. Based on the nature of the reserve, the dilution rate used to calculate the A/R advance rate should be reduced.

Final Word on Annual Dilution, Credit Lag, and Ineligibles

Certain Bbase ineligibles reduce the dilution rate used to calculate the advance rate (as just discussed) while other ineligibles reduce credit lag.

There is a simple rule in identifying which ineligibles reduce the dilution rate and which ones reduce credit lag. If a Bbase ineligible is calculated at the time of sale, it reduces dilution. This is because an ineligible for the potential dilution is included on the Bbase at the same time as the receivable. Ineligibles for sales rebates, discounts, and returns calculated at the time of sale reduce the dilution rate

If an accounting reserve is calculated after the sale then credit lag is reduced but dilution is not. Again, a receivable was included on the Bbase, while the potential dilution was recorded at a later date. Holding these Bbase ineligibles means that credit notes are effectively recorded on the Bbase more quickly, reducing or even eliminating, the need for a credit lag reserve. Ineligibles for AR aged over 90 days, partial payments, and unprocessed credit notes reduce credit lag.

The final versions of the dilution rate and credit lag ineligible calculations are as follows:

$$\text{Dilution Rate} = (\text{Dilution} - \text{less portion addressed by BBC ineligibles}) / \text{Sales}$$

$$\text{Bbase credit lag ineligible} = \text{average credit notes per day (excluding portion addressed by Bbase ineligibles)} \times [\text{credit lag in days (based on date recorded as Bbase ineligible)} - \text{average collection period}]$$

Write-offs and bad debt

Bbases typically hold all accounts aged greater than 90 days past invoice date ineligible (days may vary). Specific accounts identified as “at risk”, due to the financial condition of the customer, dispute, etc., are also usually held ineligible. While the company’s accounting reserve for bad debts is not normally included as an ineligible on the Bbase, it should be monitored to identify any problem accounts. In most cases the 90 day and “at risk” Bbase ineligibles will be more conservative than the Company’s allowance for bad debts.

With regards to dilution and ineligibles, bad debt is similar to credit notes. Bbase ineligibles for bad debt reduce the time for dilution to be recorded on the Bbase (i.e. the lag) but do not eliminate dilution. A portion of current receivables is still expected to be uncollectable in the future. From a Bbase perspective, a portion of eligible receivables will become ineligible in the future as they become greater than 90 days past invoice, some customers will go bankrupt, etc. For this reason, A/R write-offs are included in the annual dilution rate.

Summing it all up

The annual dilution rate is an average based on a period of time and is not always reliable in estimating the collectability of A/R. Additional ineligible items will frequently be required to ensure that all potentially dilutive items are captured. While the use of accounting reserves may result in a more accurate measurement of potential dilution, these reserves must be validated and care must be taken to avoid double counting. As always, the unique circumstances of a borrower must be considered when implementing Bbase ineligible items and advance rates.

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