

A Reliable Framework for Monitoring Accounts Receivable

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Introduction

Several studies [1, 2, 3, 4] have pointed out problems in the use of the collection period, or number of days sales outstanding in receivables (DSO). Criticism has centered on the sensitivity of DSO to the sales-averaging period and to the pattern of observed sales. This paper develops and illustrates a framework of accounts receivable analysis that is based on a "weighted DSO" independent of both the sales-averaging period and the pattern of sales. This framework provides a more complete and meaningful summary of a company's collection experience than do current measures.

DSO-Based Procedures Used to Monitor Collection Experience

The conventional measure of DSO is calculated by dividing the accounts receivable balance by the average daily sales. This procedure poses no problem if the monthly sales volume remains constant. Sales volume fluctuates, however, resulting in the average daily sales being determined by the sales-averaging

period selected. The DSO depends on the particular period selected. As conventionally measured, it is likewise dependent on the accounts receivable balance, which is determined not only by the sales volume of the months within the period but also by the collection experience and the position of each of these months within this period. A month of increased or decreased sales volume will affect the receivables balance more if it occurs near the end of the period of measurement. However, the conventional measure of DSO gives no weight to the sales of the more recent months of the period than to the sales of earlier months.

Lewellen and Johnson [3] have pointed out these problems of using conventional DSO analysis in evaluating receivables performance. Their solution is to abandon the use of DSO as a technique of monitoring collection experience. Instead, they propose to monitor receivables performance by comparing the percentage of monthly sales that remain outstanding at the end of a selected period to some standard based on previous experience. Although this approach offers

the receivables manager an accurate history of collections, it does not provide him with a basis on which to evaluate the trend in receivables performance or the impact of collection experience and sales pattern on the receivables investment.

Freitas [1], on the other hand, proposes a modification of conventional DSO analysis to eliminate the misleading effects of the selection of the sales-averaging period and sales fluctuations. However, because this procedure makes it impossible to identify and adequately compensate for offsetting shifts in collection experience, the receivables manager may still receive inaccurate and misleading information. Freitas recognizes that this does not allow his weighted average collection period to be an adequate tool for analysis of bad debt risk.

The framework that Freitas has proposed is an improvement of conventional DSO analysis in that it seeks to provide the receivables manager with a quantitative measure of the effect of collection experience on the receivables balance. More precisely, the analysis measures the amount by which actual receivables exceed or are less than a hypothetical receivables balance based on actual sales and a standard collection experience, referred to by Freitas as "target receivables."

The Freitas analysis involves the following procedure. First, the receivables manager establishes a period of analysis and a standard composition of the end-of-period receivables balance. This standard composition is the percentage of the original sales of each month of the period which would still be outstanding under standard collection experience as of the end of the period. Next, the manager calculates the ratio of each of these standard percentages to the total of the standard percentages of all months of the period. These ratios are the weights which the manager then multiplies by the average daily sales of each respective month, totaling to obtain the weighted average daily sales. The end-of-period receivables balance is then divided by this weighted average daily sales figure to determine the weighted average collection period.

Having determined the weighted average DSO for the period, the manager now calculates the difference in the actual receivables balance from the hypothetical "target" balance based on actual sales under standard collection experience. This requires converting the standard collection experience into a standard DSO. To do this, the standard collection percentages are summed and multiplied by 30. To find the amount by which the actual receivables balance is over or under "target receivables," the manager would subtract the

standard DSO from the weighted average DSO and multiply this figure by the weighted average daily sales.

The framework proposed by Freitas appears to offer the manager a reliable measure of receivables performance. However, if there are offsetting shifts in collection experience (both improvement and deterioration from corresponding months in the previous period) at the end of a period in which monthly sales are other than constant, the weighted average collection period cannot be relied upon. While the mechanics of the procedure will always provide an accurate measure of the amount by which actual receivables are over or under target receivables, the weighted average collection period may provide an inaccurate and misleading measure of the true collection period.

A Reliable and Meaningful Framework

Can the problem of misleading information be resolved without resorting to complex and multiple measures of performance? Are all DSO-based methods of receivables analysis unreliable? To be effective, the manager of receivables needs a measure of performance that is not only reliable but that also provides the manager with sufficient meaningful information on which to base decisions. We propose that such a meaningful measure of receivables performance include analyses of the trend in collection experience and the change in the receivables balance from the end of the preceding period to the end of the period of measurement, as well as a comparison to standard performance for the latter period. The framework would also measure the performance of each month within the period and not simply summarize the net changes in the collection period and the receivables balance for the period as a whole. An example is shown in the exhibit.

The basic difference in the mathematics of the procedure in our exhibit and that of Freitas is that, instead of weighting the daily sales, we weight the days themselves by the percent of monthly sales uncollected at the end of each period. For example, suppose we establish a standard collection experience showing 20% of the sales of the beginning month of the quarter, 60% of the sales of the following month, and 90% of the sales of the final month of the quarter still outstanding as of the end of that quarter. The weighted DSO for each of the above months is 6 days ($.2 \times 30$ days), 18 days ($.6 \times 30$ days), and 27 days ($.9 \times 30$ days), respectively, and the total weighted DSO is 51 days

Exhibit. Framework for Monitoring Accounts Receivable

Month	Sales	Receivables Outstanding at End of Period			Comparison to Previous Period			Comparison to Standard	
		Dollar Amount	Percent of Sales	Weighted DSO (days)	Change in DSO (days)	Change in Receivables Due to Change in Collection Experience*	Sales Pattern**	Actual DSO Above/Below () Standard# (days)	Actual Receivables Above/Below () Standard ##
January	\$60	\$ 12	20%	6	0	\$0	\$ 0	0	\$ 0
February	60	36	60	18	0	0	0	0	0
March	60	54	90	27	0	0	0	0	0
		<u>\$102</u>		<u>51</u>	<u>0</u>	<u>\$0</u>	<u>\$ 0</u>	<u>0</u>	<u>\$ 0</u>
April	\$30	\$ 15	50%	15	9	9	(\$ 6)	9	\$ 9
May	60	36	60	18	0	0	0	0	0
June	90	72	80	24	(3)	(9)	27	(3)	(9)
		<u>\$123</u>		<u>57</u>	<u>6</u>	<u>\$0</u>	<u>\$21</u>	<u>6</u>	<u>\$ 0</u>
July	\$90	\$ 36	40%	12	(3)	(\$9)	\$30	6	\$18
August	60	36	60	18	0	0	0	0	0
September	30	24	80	24	0	0	(48)	(3)	(3)
		<u>\$ 96</u>		<u>54</u>	<u>(3)</u>	<u>(\$9)</u>	<u>(\$18)</u>	<u>3</u>	<u>\$15</u>
October	\$60	\$ 24	40%	12	0	\$0	(\$12)	6	\$12
November	60	30	50	15	(3)	(6)	0	(3)	(6)
December	60	54	90	27	3	6	24	0	0
		<u>\$108</u>		<u>54</u>	<u>0</u>	<u>\$0</u>	<u>\$12</u>	<u>3</u>	<u>\$ 6</u>

For the purposes of this exhibit, collection experience and the sales pattern for the quarter prior to the first quarter above are considered to be identical to that of the first quarter.

* Average daily sales for the month times the change in DSO. For example, the change for April is $(\$30/30) \times 9 = \9 .

** Change in the average daily sales from the corresponding month in the previous quarter times the DSO for the corresponding month in the previous quarter. For example, the change for April is $[(\$30/30) - (\$60/30)] \times 6 = (\$6)$ — the corresponding month in the previous quarter being January.

DSO for the month less applicable standard DSO of 6 days, 18 days, or 27 days.

Actual DSO above/below () standard times the average daily sale for the month. For example, the amount for April is $(\$30/30) \times 9 = \9 .

(6 + 18 + 27). As can be seen from the exhibit, standard collection experience was achieved at the first quarter's end.

However, the weighted DSO as of the end of the second quarter has deteriorated to 57 days. Compared to the standard of 51 days, this collection period is 6 days longer than standard and the previous quarter's experience. The increase can be traced to the deterioration in the collection period in April of 9 days and the improvement in the collection period in June of 3 days. The actual dollar amount above standard accounts receivable and the change from the previous balance due to the improvement in June and the deterioration in April can be seen to be \$0. The net change in the accounts receivable from the previous quarter of \$21 is therefore the result of the changed sales pattern.

For the third quarter, the weighted DSO has improved from 57 days to 54 days. The accounts receivable balance has decreased from \$123 to \$96. This \$27 decrease in the receivables balance can be traced to an \$18 decrease due to the changed sales pattern and a \$9 decrease due to the collection period having improved three days although it is still three days longer than standard. The actual accounts receivable balance is now \$15 more than standard because a month of high volume sales displaced a month of low volume sales as the month of deteriorated collections. The comparison to standard may indicate increased investment in receivables due to shifts in the sales pattern, even when no change or improvement in collection experience has occurred from the previous quarter. Therefore, the analysis of change from the previous end-of-quarter balance and

the comparison to standard are independent analyses, and the information provided by both must be evaluated as such.

At the end of the fourth quarter, the weighted DSO has not changed from the previous quarter's end. Collection experience for the latter two months of the quarter and the sales volumes for the first and last months of the quarter have, however, changed from the previous quarter. The net effect on the receivables balance of the change in collections for November and December is \$0. The total \$12 increase in receivables is the net effect of changes in the sales pattern. The weighted DSO remains at 3 days above standard while receivables are now \$6 above standard.

The analyses of the exhibit allow the receivables manager to identify the trend in collection experience and the sales pattern, and to evaluate the current state of collections and receivables investment. The manager also sees the change in the receivables balance from the previous period's end. He or she is made aware of how much of the increased or decreased receivables investment is caused by changes in collections and how much may result from a changed sales pattern. This information may signal the need to provide for additional financing of receivables or to alter those credit-related factors that affect the volume of sales.

Conclusion

The framework developed in this paper provides a method of accounts receivable analysis and presentation that is free from any adverse effects of sales fluctuations, changes in collection experience, and offsetting shifts in collection experience. This kind of analysis will alert the manager to any deterioration or improvement in collection experience and let him or her see the resulting impact on receivable investment for the entire period of measurement and for each month within the period. Such information should help the manager of accounts receivable to be more effective.

References

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