The \textit{Lambda} Index: Beyond the Current Ratio

By Gary W. Emery and Ronald G. Lyons

Liquidity measurement is an important part of credit analysis. Analysts measure liquidity to assess the quality of new credit applicants and to monitor the solvency of current customers. For either purpose, this assessment must be based on a measure that is practical, understandable, and a reliable indicator of a company’s ability to pay its bills.

The traditional financial ratios used to measure liquidity include the current and quick ratios and various working capital turnover ratios. These measures have been popular because they are familiar and easy to apply. Unfortunately, they are not very effective because they fail to account for all the factors that affect a company’s short-term solvency.

Liquidity Is Affected by Many Factors

The amount of financial resources available in times of distress is the first factor that affects a company’s liquidity. These resources must be quickly convertible into cash to ensure that the firm can meet an unexpected requirement for funds. Furthermore, their use must not disturb operations so future liquidity is not impaired. Cash, marketable securities, and the unexercised portion of lines of credit are the principal resources that meet these requirements and must be included in the liquidity measure.

The second factor that affects a company’s liquidity is the amount of its future cash flows. Cash inflows increase a firm’s liquidity position while cash outflows diminish it. These effects must be recognized to assess the adequacy of a company’s financial resources. This is accomplished by including anticipated future net cash flows in the liquidity measure.

Future net cash flows cannot be predicted with certainty, however, and this is the third factor that affects a company’s liquidity. The greater the possibility that actual cash inflows are smaller than expected or actual cash outflows are larger than expected, the more risky is a given liquidity position.

Traditional Liquidity Measures Are Inadequate

The deficiencies of the traditional liquidity measures are readily apparent when they are examined for the factors that affect a company’s liquidity position. We’ll use the current ratio as an example to illustrate these deficiencies, but they are present in the other traditional measures as well.

The current ratio is defined as current assets divided by current liabilities. The numerator of this ratio purportedly measures a company’s liquid resources but it is inaccurate for two reasons. First, current assets include inventory and receivables which are not quickly convertible into cash. Second, current assets exclude lines of credit which are an important source of liquidity for many companies. Current assets, therefore, overstate or understate a company’s actual liquid reserves, depending on which error is more significant.

The denominator of the current ratio purportedly measures a company’s cash requirements, but current liabilities is a poor substitute for cash flow. All companies have cash requirements that are not recorded on the balance sheets and cash inflows that partially or completely offset their cash outflows. This means current liabilities understate or overstate a company’s actual future cash requirements, depending on which omission is more significant.

Finally, credit analysts often compare a company’s current ratio to the average for its industry, but this is an imprecise way to assess risk. The reason is that the current ratio ignores cash flow uncertainty which varies among companies in the same industry and across time.

These deficiencies in the current ratio make it an unreliable indicator of a company’s ability to pay its bills. An analyst cannot say, for example, that a company with a current ratio of 2:1 is twice as likely to remain solvent as a company with a ratio of 1:1. The former company may be more liquid but this conclusion is subject to many qualifications. A liquidity measure must account for all the factors that affect a company’s liquidity before one can make a precise quantitative assessment.

Using a New Liquidity Measure

\textit{Lambda} is a new liquidity ratio that has fewer limitations than the traditional measures because it accounts for all the factors that affect a company’s liquidity. This new ratio is defined as:

$$\text{Lambda} = \frac{\text{Total anticipated net initial liquid reserve + cash flow during}}{\text{Uncertainty about net cash flow during the analysis horizon}}$$

This liquidity measure has several important characteristics. First, \textit{Lambda} is practical because it can be computed from the information found in financial statements. A company’s initial liquid reserve is usually defined as cash, marketable securities, and credit lines, while cash flow from operations is the basis for computing the two cash flow variables.

These definitions are flexible, however, because...
credit lines can be excluded from the liquid reserve if the analyst believes they are unreliable. Similarly, the analyst can use annual cash flows from operations as reported on the statement of cash flows or calculate the company’s quarterly or monthly cash flow if the data is available. The variables computed from these cash flows—anticipated net cash flow and cash flow uncertainty—can be calculated as the average and standard deviation of the company’s historical cash flows or they can be estimated using more sophisticated forecasting techniques.

Second, Lambda is understandable because it has a familiar form; it is merely a coverage ratio that measures the extent to which potential cash requirements (the denominator) are covered by cash resources (the numerator). A company with a Lambda value of 3.0, for example, has liquid resources equal to three times its typical unexpected requirement for cash. This familiar form makes the ratio easier to explain and more acceptable to analysts and managers.

Lambda’s third and perhaps most important characteristic is that it was designed to estimate the probability that a company will be unable to pay its bills. This is accomplished by looking up a company’s Lambda value in a normal probability table. For example, the probability of cash insolvency is approximately .001 if a company’s Lambda is 3.0 but it is only .0000003 if Lambda equals 5.0.

Illustrations Show Benefits of Lambda

Exhibit 1 shows the results of applying Lambda to the W.T. Grant Company which filed for bankruptcy in 1975. The company’s liquid reserves and cash flows from operations were obtained from its published financial statements and used to calculate Lambda for each year from 1964 to 1974. The graphs reveal that Grant’s problems began in 1966 when its Lambda value deteriorated from 3.74 to .28. This corresponds to an increase in the probability of cash insolvency from approximately .001 to .40. W.T. Grant’s liquidity position never recovered and the risk of financial distress remained high until its actual failure in 1975.

Exhibit 2 provides the computations made to apply Lambda to two of Amoco Production Company’s credit customers. Company A was a large firm known to be in sound financial condition; Company B was reorganized in a leveraged buy-out in 1987. Their Lambda values in 1989 indicated that Company A had very secure liquidity position while Company B had a high likelihood of cash insolvency. As predicted by its low Lambda, Company B actually filed for Chapter 11 in 1990.

Similar results were obtained in a more comprehensive test. The sample was 52 companies that became bankrupt and 52 matching companies that remained solvent. Using information taken from annual reports, issued one year prior to bankruptcy, Lambda was able to distinguish between failing and safe companies with 94 percent accuracy.

Lambda is a new liquidity measure that incorporates the factors that affect a company’s liquidity in the form of a coverage ratio. This form and the use of ordinary financial statements makes Lambda understandable and practical. Furthermore, this ratio and a normal probability table can be used to obtain a quantitative assessment of a company’s risk of cash insolvency. Since this is the very purpose for measuring liquidity, using Lambda should improve credit analysis of both new and continuing customers.

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