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Can One Predict A Private Company Bankruptcy?

Yes! And because we did, one of our clients was able to purchase a distressed company by merely assuming its assets and liabilities. Of course, we immediately had our client restructure the company to eliminate its financial exposure. The sellers were happy to complete the transaction because they were on the bank note with their personal guarantees.

Bankruptcy can be predicted by using the Z-Score method formulated by Dr. Robert Altman, a financial economist and professor at the New York University Stern School of Business in 1968. Subsequently, many academics have both studied the method and measured its effectiveness both forensically and predictably and have proven the model to work well over 85% of the time.

It is not theoretical, but predictable 12 months in advance. Today, credit professionals use the method in determining whom to grant credit. Others use the method to take action to improve their capital structure and balance sheet in order to head off the dreaded event.

Altman did his work using public company information because it was available from the company 10-Ks filed with the SEC. He used standard ratios and their components to establish a Z-Score. The ratios are given a weighted average to calculate the Z-Score.

How Does It Work?

The ratio components used are as follows:

1. Working Capital / Total Assets. Working capital is current assets less current liabilities. Working capital that is negative or is approaching zero indicates that the company is or is going to have difficulty paying its bills and other current obligations.
2. Retained Earnings / Total Assets. Retained earnings occurs when the owners leave capital in the company. Too many owners of private companies do not leave enough cash in the company which can result in difficulties for the company in the event of a down year.
3. EBIT / Total Assets. Earnings Before Interest and Taxes is the key measure of a company's ability to generate cash to pay its interest on debt, pay its creditors and provide a return for its owners.

4. Market Value of Equity / Book Value of Total Liabilities. The market value of a public company is the share price multiplied by shares outstanding. The market value of a private company is a little trickier because its market value drops dramatically if the company is perceived to be under stress. So the value used in the equation is its net asset value or book value.
5. Sales / Total Assets. Sales to total assets measures how efficiently a company turns over its assets to generate sales. It is sometimes referred to as asset turns or asset turnover.

The method differs slightly for manufacturing companies versus non-manufacturing companies. The method and formula for calculating Z-Score is defined in the box shown below. These formulas apply to private companies. The equity component is different for public companies.

For manufacturing companies, A Z-Score of 1.23 or below indicates a probable bankruptcy. A Z-Score of 2.90 or above indicates that the company is not likely to file bankruptcy. A higher score is better. A Z-Score that falls in the range of 1.23 to 2.90 is fuzzy, so prudent management should be wary and take steps to improve the components of the scoring system.

For non-manufacturing companies the Sales to Assets ratio is not used in the formula. A Z-Score of 1.10 or below shows that bankruptcy is probable and a Z-score of 2.60 or above indicates that bankruptcy is not likely. A Z-Score between 1.10 and 2.60 is uncertain and could easily slip in a two year time frame if measures are not taken to improve the components of the formula.

The following formulation boxes are from work done by the Graduate Business School of Pepperdine University. The second box, Textbox 1, is from Altman's original work.

Textbox 2. The Z′ and Z″ Models

The Z' model is used to predict bankruptcy of privately-held manufacturing firms and takes the following form:

$$Z' = 0.717\ X_1 + 0.847\ X_2 + 3.107\ X_3 + 0.420\ X_4 + 0.998\ X_5 \quad (3)$$

Definitions of all ratios are the same that in the original Z-score model, except X_4, which in this case means book value of equity / total liabilities. Firms with $Z' < 1.21$ are classified as bankrupt, $Z' > 2.90$, as non-bankrupt; the space in-between, similar to the original model, is a "gray area", where the probability of incorrect classification is high.

The Z'' model is used to predict bankruptcy of privately-held non-manufacturing firms and takes the following form:

$$Z'' = 6.56\ X_1 + 3.26\ X_2 + 6.72\ X_3 + 1.05\ X_4 \quad (4)$$

Note that asset turnover (X_5) was excluded to minimize the potential industry effect. Other ratios are defined similarly to the Z' model. The cutoff scores are also the same as those used in the Z' model.

In the case or privately held companies, there is no publicly available source of financial information, so you would need to request the data from the firm itself or use Dun & Bradstreet data.

Textbox 1. The Z-score Model Specification

The original Altman model took the following form:

$$Z = 0.012\ X1 + 0.014\ X2 + 0.033\ X3 + 0.006\ X4 + 0.999\ X5 \quad (1)$$

where

X_1 = working capital/total assets,

X_2 = retained earnings/total assets,

X_3 = earnings before interest and taxes/total assets,

X_4 = market value of equity/book value of total liabilities, and

X_5 = sales/total assets

In the original version, all ratios were stated as percentages, except X_5, which was stated as an absolute value. For example, if EBIT/total assets ratio were 15 percent, or 0.15, X_3 would be assumed to equal 15. Eventually, a more convenient specification was proposed:

$$Z = 1.2\ X_1 + 1.4\ X_2 + 3.3\ X_3 + 0.6\ X_4 + 1.0\ X_5 \quad (2)$$

In this specification, an EBIT/total assets ratio of 15 percent would result in X_3=0.15. X_5, as was the case in the original version, is stated as an absolute value. Altman himself used this version in Altman and LaFleur (1981). In the initial 1968 study, Altman used a cutoff Z-score of 2.675. After further testing, he recommended lowering the cutoff Z score to 1.81 and treating Z-scores between 1.81 and 2.675 as a "gray area" or "ignorance zone".

In the case of publicly traded companies, the data needed to do these tests is available on the annual (form 10-K) and quarterly (form 10-Q) reports that are required to be filed with the Securities and Exchange Commission (SEC). The SEC makes those reports available online via Electronic Data Gathering and Retrieval System (EDGAR):

http://www.sec.gov/cgi-bin/browse-edgar

The acquisition that we referred to in the opening paragraph was referred to us by our client's supplier who also supplied the target company. The supplier was worried that they would not be paid. The subject target company's bank and other suppliers were all also supportive of the transaction because they suspected that they were at risk. The owners were approximately four months from bankruptcy and were happy to avoid an excruciating prolonged period of going through a painful process that may well have forced their personal bankruptcy as well.

If you would like to see how your company would fare in the Z-Score and what to do about it, please call us.