**Article by Bernard Vallely FCCA MBA, relevant to the following subjects;**

**Professional 1: Managerial Finance**
**Professional 2: Strategic Corporate Finance**
**Professional 2 (Transition): Financial Management**

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# Predicting Corporate Failure

## Introduction
In these days of common and high profile corporate collapses e.g. Lehman Brothers it is important that accountants appreciate why organisations collapse and to consider whether or not imminent collapse can be predicted.

## Reasons for Collapse
There are many reasons why organisations may collapse including:

- Ineffective financial risk assessment and management (hedging etc)
- Ineffective working capital management leading to illiquidity/overtrading
- Inadequate financial planning and budgetary control e.g.
- Fraud e.g. Enron, World-Com, etc.
- Inadequate corporate governance
- Loss of key management and staff
- Poor industrial relations e.g. Aer Lingus Plc
- Over-dependence on a single supplier/product
- Legislation changes e.g. smoking in the workplace ban
- Quality problems
- Entry of a new competitor
- Technical/technological obsolescence
- Loss of customer/marketplace focus e.g. IBM
- Unsuccessful mergers/acquisitions e.g. Baltimore Securities
- Loss of a major customer, franchise or patent
- Research and development failure e.g. Elan Corporation

## Predicting Corporate Failure
There are many ways in which the likelihood of corporate failure may be reviewed. In today's world of liquidity difficulties the most important indicators include the liquidity/solvency ratios, particularly the current and quick ratios. A comparison of how these ratios change over time and how they relate to the recommended averages may indicate whether or not a liquidity problem and potential corporate collapse is looming.
In today's economic climate overtrading can also pose the risk of illiquidity and lead to corporate collapse. Overtrading occurs when an organisation attempts to support an

increasing recurrent investment in working capital and non-current assets without having sufficient long term funding in place. Overtrading is particularly prevalent in rapidly expanding businesses.

Symptoms of overtrading may include:

- rapid increase in turnover
- rapid increase in inventory holding and trade receivables
- deteriorating cash holdings
- deteriorating current and quick ratios
- inability to meet obligations when they fall due

To avoid overtrading management must ensure that long term sources of funds are used to fund the recurrent investment in working capital and non-current assets.

**Altman's Z-Scores**

Edward Ian Altman, Professor and Vice-Director of New York University's Salomon Center, is a recognised authority on predicting corporate failure. He is a founding father of using statistical techniques to predict corporate failure. He developed the Z –Score model some 30 years ago and it is still used today. Professor Altman researched 66 companies that experienced corporate failure to determine whether or not their failure could have been predicted. The model is used by investors and analysts to inform them of the financial risk associated with potential investments.

Essentially, the Z-score model involves the following three steps;

**Step 1:** Calculate the following five ratios from the most recent available financial statements of the company being assessed:

| Ratio | Definition |
|---|---|
| Return on Total Assets | $\frac{\text{EBIT}}{\text{Total Assets}}$ |
| Sales to Total Assets | $\frac{\text{Sales}}{\text{Total Assets}}$ |
| Equity to Debt | $\frac{\text{MV Equity}}{\text{Total Liabilities}}$ |
| Working Capital to Total Assets | $\frac{\text{Working Capital}}{\text{Total Assets}}$ |
| Retained Earnings to Total Assets | $\frac{\text{Retained Earnings}}{\text{Total Assets}}$ |

**Step 2**: Weight the ratios calculated in step 1 to arrive at a weighted average Z-Score.

| Ratio | Weighting |
|---|---|
| Return on Total Assets | 3.3 |
| Sales to Total Assets | 1 |
| Equity to Debt | 0.6 |
| Working Capital to Total Assets | 1.2 |
| Retained Earnings to Total Assets | 1.4 |

**Step 3**: Interpret the Z Score as follows:

| Z-Score | Interpretation |
|---|---|
| **2.99 and above** | **No imminent danger. Collapse Unlikely** |
| **1.81 to 2.98** | **A Warning Sign that collapse is a possibility. Manage(and invest) carefully** |
| **below 1.81** | **Collapse/Bankruptcy is likely** |

**Worked Example:**

The following worked example using a fictitious company Rock Limited, calculates and interprets the company's Z-Score. The company's most recently published financial statements read as follows;

| **Rock Limited**<br>**Income Statement For Year Ended 31st December 2008** | | |
|---|---|---|
| | **2008** | **2007** |
| | €Ms | €Ms |
| **Sales** | 25678 | 24158 |
| Opening Inventories | 1256 | 755 |
| Purchases | 18151 | 17102 |
| Closing Inventories | 1678 | 1256 |
| **Cost of Sales** | 17729 | 16601 |
| **Gross Profit** | 7949 | 7557 |
| Selling & Distribution Expenses | 2335 | 2159 |
| Administration Expenses | 3009 | 3011 |
| **Profit Before Interest & Tax** | 2605 | 2387 |
| Finance Charges | 1268 | 148 |
| Corporation Tax | 360 | 239 |
| **Profit After Interest & Tax** | 977 | 2000 |
| **Proposed Dividend** | 800 | 800 |
| **Retained Profit** | **177** | **1200** |
| | | |
| **Share Price as at 31st December 2008** | **4.59** | |

| Rock Limited<br>Balance Sheet as at 31st December 2008 | | |
|---|---|---|
| | 2008<br>€Ms | 2007<br>€Ms |
| **Non Current Assets at NBV** | | |
| Property and Plant | 44156 | 42159 |
| Other Assets | 2156 | 2011 |
| **Total Non-Current Assets** | 46312 | 44170 |
| | | |
| **Current Assets** | | |
| Inventories | 1678 | 1256 |
| Trade Receivables | 1589 | 989 |
| Cash & Cash Equivalents | 0 | 1212 |
| **Total Current Assets** | 3267 | 3457 |
| | | |
| **Total Assets** | 49579 | 47627 |
| | | |
| **Equity & Liabilities** | | |
| | | |
| **Equity Attributable to Equity Holders** | | |
| Share Capital (@ €1 each) | 2200 | 2200 |
| Other Reserves | 42335 | 40958 |
| | 44535 | 43158 |
| | | |
| **Non Current Liabilities** | | |
| Long term borrowings - Debentures | 0 | 1200 |
| | | |
| **Current Liabilities** | | |
| Trade payables | 2156 | 1896 |
| Dividend payable | 800 | 800 |
| Short Term Borrowings | 1520 | 0 |
| Current portion of long term borrowings | 568 | 573 |
| **Total Current Liabilities** | 5044 | 3269 |
| | | |
| **Total Liabilities** | 49579 | 47627 |

The company's Z-Score as at 31st December 2008 is calculated as follows:

| Altman's Z-Scores | Measure | Calculation | Value | Weighting | Result |
|---|---|---|---|---|---|
| Return on Total Assets | EBIT | 2605 | 0.053 | 3.3 | 0.173 |
| | Total Assets | 49579 | | | |
| Sales to Total Assets | Sales | 25678 | 0.518 | 1 | 0.518 |
| | Total Assets | 49579 | | | |
| Equity to Debt | MV Equity | =(4.59*2,200) | 2.002 | 0.6 | 1.201 |
| | Total Liabilities | 5044 | | | |
| Working Capital to Total Assets | Working Capital | =(3267-5044) | -0.036 | 1.2 | -0.043 |
| | Total Assets | 49579 | | | |
| Retained Earnings to Total Assets | Retained Earnings | 177 | 0.004 | 1.4 | 0.005 |
| | Total Assets | 49579 | | | |
| **Z Score** | | | | | **1.854** |

**Interpretation**

The Z Score for Rock Limited would suggest that there is a distinct possibility of corporate collapse as the Z-score calculated lies just above the danger zone of 1.81.

**Conclusion**

In these challenging times it is important that management, investors and other interested stakeholders should consider the financial health of their organisations on an ongoing basis.

Whilst Altman's Z-Score model may be used as a standardised assessment of the likelihood of corporate collapse it should be appreciated that a detailed analysis of financial statements of the company, in addition to a consideration of the environmental factors (perhaps structured using a PESTEL analysis) e.g. competition, economic conditions, interest rates etc. affecting the company may best enable management, investors and other interested stakeholders to assess the likelihood of corporate collapse.