BUSINESS FAILURE

PREDICTION AND PREVENTION

RELEVANT TO ACCA QUALIFICATION PAPERS P4 AND P5

Students are required to be familiar with failure prediction models based on both quantitative and qualitative information, and also to comprehend the underlying factors leading to the decline and eventual demise of a company. In this article, the various failure prediction models are critically discussed and an attempt is made to identify the most significant reasons for eventual company failure.

According to recent statistics from the UK's Ministry of Justice, almost 12,000 companies filed for insolvency in 2007 in England and Wales. This number is forecast to increase significantly (to around 13,500 companies) in 2008 (*Financial Times*, 2 January 2008) as the financial crisis hits businesses in the wider economy. Smaller companies are likely to suffer most because of a slowing economy and the increasing costs of borrowing in a deteriorating business environment.

THE MODELS

Corporate failure models can be broadly divided into two groups: quantitative models, which are based largely on published financial information; and qualitative models, which are based on an internal assessment of the company concerned. Both types attempt to identify characteristics, whether financial or non-financial, which can then be used to distinguish between surviving and failing companies.

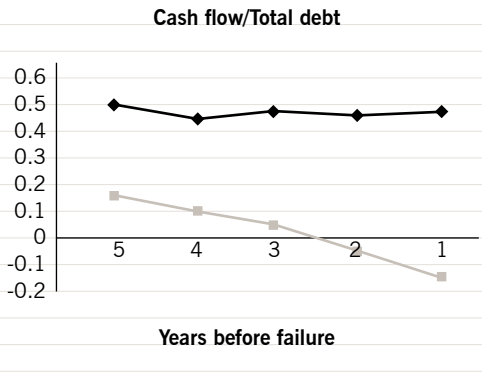
Quantitative models

Quantitative models identify financial ratios with values which differ markedly between surviving and failing companies, and which can subsequently be used to identify companies which exhibit the features of previously failing companies. Commonly-accepted financial indicators of impending failure include:

- ☐ low profitability related to assets and commitments
- ☐ low equity returns, both dividend and capital
- ☐ poor liquidity
- ☐ high gearing
- ☐ high variability of income.

The pioneer of corporate failure prediction models which used financial ratios was William Beaver (1966). He applied a univariate model in which a classification model was carried out separately for each ratio, and (also for each ratio), an optimal cut-off point was identified where the percentage of misclassifications (failing or non-failing) was minimised. The misclassification could be either classifying a failing firm as non-failing (a Type I error), or classifying a non-failing firm as failing (a Type II error). Beaver selected a sample of 79 failed firms and 79 non-failing firms and investigated the predictive power of 30 ratios when applied five years prior to failure. Of the ratios examined, he found that the 'cash flow to total debt' ratio (**Figure 1**) was most significant in predicting failure, with a success rate of 78% for five years before bankruptcy.

FIGURE 1: CASH FLOW TO TOTAL DEBT RATIO



Although the simplicity of the univariate approach is appealing, there are a number of potential problems:

- ☐ Company classification is based on one ratio at a time, which may give inconsistent and confusing classification results for different ratios used on the same company.
- ☐ It contradicts reality, in that the financial status of a company is complex and cannot be captured by one single ratio.
- ☐ The optimal cut-off point is chosen on an ex-post basis, ie when the actual failure status of each company is known. As a result, the cut-off points may be sample-specific and the classification accuracy may be much lower when applied on a predictive basis.

The logical solution is to select a combination of ratios, a multivariate approach, in an attempt to provide a more comprehensive picture of the financial status of a company. Following Beaver, Altman (1968) proposed 'multiple discriminant analysis' (MDA). This provided a linear combination of ratios which best distinguished between groups of failing and non-failing companies. This technique dominated the literature on corporate failure models until the 1980s and is commonly used as the baseline for comparative studies.

In the MDA model, the ratios are combined into a single discriminant score, termed a 'Z score', with a low score usually indicating poor financial health. Altman's study involved 66 manufacturing companies with equal numbers of failures and survivors, and a total of 22 ratios from five categories, namely liquidity, profitability, leverage, solvency, and activity. From this set of ratios, five were finally chosen on the basis of their predictive ability. Altman's original Z score equation was:

$$Z = 0.012X1 + 0.014X2 + 0.33X3 + 0.006X4 + X5$$

Where:
X1 = working capital/total assets
X2 = retained earnings/total assets
X3 = profit before interest and tax/total assets
X4 = market value of equity/book value of debt
X5 = sales/total assets

The pass mark for Altman's Z score was three, above which companies would be considered

LINKED PERFORMANCE OBJECTIVES
PERFORMANCE OBJECTIVES 15 AND 16 ARE RELEVANT TO PAPER P4
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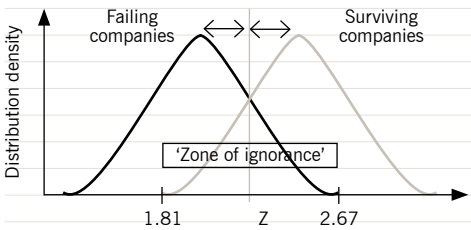
relatively safe. Companies with Z scores below 1.8 would be classified as potential failures; scores between 1.8 and three were in a grey area. He found a misclassification rate of 5% one year prior to failure and 17% two years prior to failure.

FIGURE 2: LINEAR DISCRIMINATE ANALYSIS



In the UK, a similar methodology was employed by Taffler and Tishaw (1977) based on a sample of 92 manufacturing companies. The resulting Z score equation was based on a combination of four ratios, albeit with undisclosed coefficients:

$Z = co + c1X1 + c2X2 + c3X3 + c4X4$

Where:
X1 = profit before tax/current assets (53%)
X2 = current assets/current liabilities (13%)
X3 = current liabilities/total assets (18%)
X4 = no credit interval (16%)

The percentages reveal a guide to the relative weightings of the ratios. Taffler and Tishaw claimed a 99% successful classification based on the original 92 companies from which the model was derived. However, when the model was tested by Taffler (1983) on a sample of 825 companies, the results were less convincing. The equation then classified 115 out of the 825 quoted industrial companies as being at risk. In the following four years, 35% went bankrupt and a further 27% were still at risk.

Both Altman and Taffler's original models were then developed further. Altman et al (1977) addressed the problem of the assumption regarding the normal distribution of ratios in their ZETA model. Taffler then adapted the Z score technique to develop the Performance Analysis Score (PAS).

This forms a ranking of all company Z scores in percentile terms, measuring relative performance on a scale of 0 to 100. A score of X means that 100 - X% of companies have higher Z scores (eg a score of 80 means 20% have higher scores). As the PAS score over time shows the relative performance trend of a company, any downward trend should be investigated immediately.

Ezzamel, Brodie and Mar-Molinero (1987) briefly reviewed the earlier research and reported their UK study of financial ratios using factor analysis. Using 53 ratios, they described five broad patterns:

- ☐ capital intensiveness
- ☐ profitability expressed as earnings, or cash flows as related to assets or funds
- ☐ working capital position
- ☐ liquidity position
- ☐ asset turnover.

They concluded that these patterns were not stable during the period of their study, even when considering the same group of companies. However, their general conclusions were that it was possible to identify distinct financial patterns and that these could be used to reduce the number of ratios being studied, but that the long-term instability of the patterns made their application to different periods or countries difficult.

The last in the category of quantitative models is the H score, devised by Company Watch (**www.companywatch.net**). As with the Z score, the H score is based on discriminant analysis, in which characteristics of companies are used to optimally discriminate between those which subsequently failed within a specified time period and those which survived. Similar to Taffler's PAS, it is a ranked percentile score taking a value between 0 and 100. The interpretation of a particular H score, for example 20, is that only 20% of companies have characteristics even more indicative of failed companies, and therefore the company's health would be judged as relatively weak.

The threshold identified by Company Watch is a score of 25, below which companies are described as being in the 'Warning Area'. The H score distinguishes between different types of company by using a suite of sub-models – these are associated with a particular category of company with broadly similar balance sheet structures.

A company's valuation is based on seven key discriminating factors which are grouped into three key management areas, each on a percentile basis:

1. Profit management, as measured by changes in profitability.
2. Asset management, as measured by liquidity, working capital, and current asset cover.
3. Funding management, as measured by adequacy of the capital base, dependency on debt, and dependency on current liabilities.

In conclusion, the statistical evidence supporting both univariate and multivariate techniques of predicting failure is generally impressive and often reveals considerable predictive power. Certain caveats should, however, be borne in mind:

- ☐ The precise specification of a model will be sample specific, and decision makers should exercise care when using previous models.
- ☐ The value of a model is difficult to assess without a realistic costing of Type I and II errors.

Qualitative models

This category of model rests on the premise that the use of financial measures as sole indicators of organisational performance is limited. For this reason, qualitative models are based on non-accounting or qualitative variables. One of the most notable of these is the A score model attributed to Argenti (1976), which suggests that the failure process follows a predictable sequence:

Defects
↓
Mistakes made
↓
Symptoms of failure

Defects can be divided into management weaknesses and accounting deficiencies as follows:

Management weaknesses:

- ☐ autocratic chief executive (8)
- ☐ failure to separate role of chairman and chief executive (4)
- ☐ passive board of directors (2)
- ☐ lack of balance of skills in management team – financial, legal, marketing, etc (4)
- ☐ weak finance director (2)
- ☐ lack of 'management in depth' (1)
- ☐ poor response to change (15).

Accounting deficiencies:

- ☐ no budgetary control (3)
- ☐ no cash flow plans (3)
- ☐ no costing system (3).

Each weakness/deficiency is given a mark (as shown) or given zero if the problem is not present. The total mark for defects is 45, and Argenti suggests that a mark of 10 or less is satisfactory.

If a company's management is weak, then Argenti suggests that it will inevitably make mistakes which may not become evident in the form of symptoms for a long period of time. The failure sequence is assumed to take many years, possibly five or more. The three main mistakes likely to occur (and attached scores) are:

1 high gearing – a company allows gearing to rise to such a level that one unfortunate event can have disastrous consequences (15)
2 overtrading – this occurs when a company expands faster than its financing is capable of supporting. The capital base can become too small and unbalanced (15)
3 the big project – any external/internal project, the failure of which would bring the company down (15).

The suggested pass mark for mistakes is a maximum of 15.

The final stage of the process occurs when the symptoms of failure become visible. Argenti classifies such symptoms of failure using the following categories:

1 Financial signs – in the A score context, these appear only towards the end of the failure process, in the last two years (4).
2 Creative accounting – optimistic statements are made to the public and figures are altered (inventory valued higher, depreciation lower, etc). Because of this, the outsider may not recognise any change, and failure, when it arrives, is therefore very rapid (4).
3 Non-financial signs – various signs include frozen management salaries, delayed capital expenditure, falling market share, rising staff turnover (3).
4 Terminal signs – at the end of the failure process, the financial and non-financial signs become so obvious that even the casual observer recognises them (1).

The overall pass mark is 25. Companies scoring above this show many of the signs preceding failure and should therefore cause concern. Even if the score is less than 25, the sub-score can still be of interest. If, for example, a score over 10 is recorded in the defects section, this may be a cause for concern, or a high score in the mistakes section may suggest an incapable management. Usually, companies not at risk have fairly low scores (0–18 being common), whereas those at risk usually score well above 25 (often 35–70).

The A score has therefore attempted to quantify the causes and symptoms associated with failure. Its predictive value has not been adequately tested, but a misclassification rate of 5% has been suggested. While Argenti's model is perhaps the most notable, a large number of non-accounting or qualitative variables have been included in other studies. These include:

- ☐ company-specific variables – such as management experience, customer concentration, dependence on one or a few suppliers, level of diversification, qualified audit opinions, etc
- ☐ general characteristics – such as industry type
- ☐ factors in the external environment – such as the macroeconomic situation, including interest rates, the business cycle, and the availability of credit.

OTHER SYMPTONS OF FAILURE

Many other lists of symptoms of failure exist. For example, there is a list of 65 reasons on the UK Insolvency website which include:

1 Failure to focus on a specific market because of poor research.
2 Failure to control cash by carrying too much stock, paying suppliers too promptly, and allowing customers too long to pay.
3 Failure to control costs ruthlessly.
4 Failure to adapt your product to meet customer needs.
5 Failure to carry out decent market research.
6 Failure to build a team that is compatible and has the skills to finance, produce, sell, and market.
7 Failure to pay taxes (insurances and VAT).
8 Failure of businesses' need to grow. Merely attempting stability or having even less ambitious objectives, businesses which did not try to grow didn't survive.

USEFUL WEBSITES
WWW.COMPANYWATCH.NET
WWW.BRIANTRACY.COM

9 Failure to gain new markets.
10 Under-capitalisation.
11 Cash flow problems.
12 Tougher market conditions.
13 Poor management.
14 Companies diversifying into new, unknown areas without a clue about costs.
15 Company directors spending too much money on frivolous purposes thus using up all available capital.

ULTIMATE REASON FOR FAILURE

It has been suggested that the ultimate reason for business failure is poor leadership. According to business guru, Brian Tracy, 'Leadership is the most important single factor in determining business success or failure in our competitive, turbulent, fast-moving economy.' Based on a study by the US Bank, the main reasons why businesses fail are:

☐ poor business planning
☐ poor financial planning
☐ poor marketing
☐ poor management.

Proper application of these key factors is a function of good leadership. According to the study, in the business planning category, 78% of businesses fail due to the lack of a well-developed business plan. Remember the old saying: 'If you fail to plan, you plan to fail.'

Leadership is about planning for success before it happens. Sun Tzu, the 6th century Chinese philosopher, in his epic work *The Art of War*, gave some sound advice that still applies to business today: 'When your strategy is deep and far-reaching, then what you gain by your calculations is much, so you can win before you even fight. When your strategic thinking is shallow and near-sighted, then what you gain by your calculations is little, so you lose before you do battle.'

In the financial planning category, 82% of businesses failed due to poor cash flow management skills, followed closely by starting out with too little money. Business leadership is about taking financial responsibility, conducting sound financial planning and research, and understanding the unique financial dynamics of one's business. Half of the UK's small businesses fail within the first three years because of cash flow problems. They either run out of money or run out of time. Consumer debt, personal bankruptcies, and company insolvencies are all now on the increase.

The third business failure factor profiled in the study, and a critical one, was marketing. Over 64% of the businesses surveyed in the marketing category failed because their owners ignored the importance of properly promoting their business, and then ignored their competition. Again, as a business leader, you must be able to effectively communicate your idea to the right people and understand their unique needs and wants. Leadership is all about taking initiative, taking action, getting things done, and making decisions. If you are not doing anything of significance to market and promote your business, you are most likely headed for business failure.

You must also know your competition. Leadership is about providing value to customers; if your main competitors are all providing a better quality and lower priced product, how can you possibly create any value? Either you harness your strengths to provide different benefits (such as speed, convenience, or better service), lower your price and improve quality, create a different product for an unmet demand, or get out of the game.

Finally, one of the most important reasons why businesses fail is due to poor management. In the management category, 70% of businesses failed due to owners not recognising their failings and not seeking help, followed by insufficient relevant business experience. Not delegating properly and hiring the wrong people were additional major contributing factors to business failure in this category.

An interesting, alternative method of classifying reasons for failure is provided by Richardson et al (1994), who use the analogy of frogs and tadpoles:

1 **Boiled frog failures**
These are long-established organisations which exhibit the often observed organisational characteristics of introversion and inertia in the presence of organisational change. This category can be illustrated by the problems faced by ICI.

2 **Drowned frog failures**
Less to do with management complacency and more to do with managerial ambition and hyperactivity. In the smaller company context, this is the failed ambitious entrepreneur, whereas in the bigger context this is the failed conglomerate kingmaker, perhaps typified by Robert Maxwell.

3 **Bullfrogs**
Expensive show-offs who need to adorn themselves with the trappings of success. The bullfrog exists on a continuum from the 'small firm flash' to the 'money messing megalomaniac'. The behaviour of bullfrogs often raises ethical issues due to a failure to separate business expenditure from personal expenditure (for example, Conrad Black).

4 **Tadpoles**
Tadpoles never develop into frogs and represent the failed business start-up in the small business setting. In the large business context, the tadpole is typified by the business which is dragged down by a big new project which turns out to be such an expensive failure that it destroys its parent. New products and services often fail, such as the Sinclair home computer. Small tadpoles usually fail to become frogs because of over-optimism, a failure to make contingency plans and a lack of interest in overall success as a result of too much focus on the product.

AVOIDING FAILURE

Perhaps the best way to avoid failure is to examine the myriad explanations for business failure. Many books and articles have focused on identifying reasons for failure as a remedy for prevention. One of the more significant earlier works was by Ross and Kami (1973); they gave 'Ten Commandments' which, if broken, could lead to failure:

1 You must have a strategy.
2 You must have controls.
3 The Board must participate.
4 You must avoid one-man-rule.
5 There must be management in depth.
6 Keep informed of, and react to, change.
7 The customer is king.
8 Do not misuse computers.
9 Do not manipulate your accounts.
10 Organise to meet employees' needs. ■

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