

Reasons for Insolvency Amongst Small Firms — A Review and Fresh Evidence

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ABSTRACT. The growing and diverse literature on insolvency is comprehensively and critically reviewed. The limited portfolio that small firms represent, in particular as regards their managerial capabilities, is suggested as an added reason for the strong inverse correlation of probability of insolvency with firm size. The evidence from a hitherto largely untapped source of data, the reports of the British Official Receiver, is analysed using contingency tables. The most important reason for their failure given by the owners of insolvent firms is weaknesses in operational management, particularly in the adequacy of their capital. Marked inter-temporal and inter-regional differences are evident within the data.

I. Introduction

During the 1980s there have been a number of important papers on the reasons for corporate failure, hitherto, with some notable exceptions, a largely neglected area of research. For once, the small firm sector is not a poor relation in terms of the amount of attention it has received. Apart from within the failure prediction literature, empirical studies usually include small firms in their samples, and theories of failure often have more relevance for small firms, especially if they are young, than for the large and well established.

This paper will discuss the state of knowledge on reasons for corporate failure, will suggest some further explanations and will present a fresh set of factors associated with failure, including the opinions of owners on why it took place, as provided

by the reports of the British Official Receiver (O.R.).

II. Previous results

The most well-known literature on corporate failure, dating from Beaver (1967) and Altman (1968), and now too long to be cited with any hope of achieving justice (but four useful reviews are provided by Ohlson, 1980, Amemiya, 1981, Taffler, 1983, and Altman, 1984), is concerned with the prediction of failure. This tradition has four dominating traditions. Firstly, samples are drawn from the quoted sector, though with the important exception of Storey, Keasey, Watson and Wynarczyk (1987). Secondly, the focus of attention is on variables supplied in published accounts. Thirdly, the objective is to produce models which enable the probability of the failure of an individual firm to be estimated, or, at least, the discrimination of "likely" failures from "likely" survivors. The motive behind this objective is usually to improve the operation of the capital market, occasionally through the provision of a service that is commercially available. Fourthly, there is little theory behind the choice of variables.

Expanding on this last point, selection of variables is almost invariably based on the enhancement of predictive or discriminatory power with, perhaps, some rationalisation of their implications *ex post*. Taffler (1982), for instance, started his discriminatory runs with a set of one hundred and fifty financial variables and concluded that profitability and the ratio of total liabilities to net capital employed were the most significant in identifying likely failures. Even Storey *et al.* (1987) and Keasey and Watson (1987) in their ingenious attempts at testing some of the hypotheses on corporate failure formulated

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by Argenti (1976), by including, as variables, such factors as director turnover and audit lags, still employ a stepwise procedure to make their final selection.

It must be emphasised that lack of theory, and the inclusion of financial variables that are essentially symptoms rather than causes, need not effect the usefulness of predictive models. This should be determined with reference to the stability of coefficients between samples and overtime, to the loss function taking into account both type I and II errors, and to the superiority of statistical predictive models over alternatives, the judgment of trade credit assessors, for instance, or simply tossing a coin. It is beyond the scope of this paper to judge the extent that predictive models meet such criteria, though some indication is provided by Keasey and Watson (1986) with more jaundiced views being expressed by Doukas (1986) and, most damagingly, Wood and Piesse (1988).

Whatever the conclusion that may be reached on this, however, there would seem little doubt that the predictive literature, on the whole, provides few clues as to why corporate failure takes place. Researchers that have attempted to provide such clues have tended to formulate either of two hypotheses and, occasionally, both. The first is that firms will fail because the present value of their costs exceeds that of their revenues. They then consider how this might arise. The second hypothesis is that inefficiencies in the capital market can lead to failure amongst firms with positive net present values. In addition, useful insights into the reasons underlying failure have been provided by studies of entry and exit rates amongst businesses, even though the studies may be largely descriptive and the businesses need not be independent.

The most well-known theory of reasons for negative net present values is provided by Argenti *op. cit.*, who based his conclusions on a number of cases drawn from various sources. He lists twelve diverse reasons for failure, including one-man rule, imbalanced top team, lack of management depth, the unification of the chairman — chief executive roles and the concentration of resources into a single big project. Clearly, though Argenti was not particularly concerned to make this point, these are all usually characteristics of small firms.

An elegant model of failure is provided by Jovanovic (1982) and made more accessible, as

well as being tested, by Dunne, Roberts and Samuelson (1989). Jovanovic focuses his attention on why failures are more likely to be small and young. The lynchpin of his model is that a firm faces a density function, $H(\theta_{t+1}|\theta_t)$, of costs in the next period given its current costs, and this in turn locates its position on $J(q_{t+1}|q_t)$, the density function of outputs over both periods. q_t , and hence q_{t+1} , will be large when θ_t is small. The firm may be able to improve its position on the cost function over time through an unspecified learning process.

The implications of the model are that failure to achieve a critical, minimum level of costs, θ_{t+1} , will lead to an output level q_{t+1} associated with exit, and this, in turn, will generate a critical growth path which must be achieved if exit is to be avoided. It follows that larger firms are less likely to face costs higher than θ_{t+1} than are older firms, because they have acquired more precise estimates of their cost density functions, i.e., the variance of $H(\theta_{t+1}|\theta)$ reduces over time. In short, firms either learn to be more efficient and grow or fail to learn and exit.

Whilst Wadhvani (1986), Hudson (1986) and Simmons (1989) present theories on the sources and implications of imperfections in the capital market, which will be discussed shortly, they test models which include variables designed as surrogates for shocks to cost or revenue flows. Wadhvani employed measures of real hourly earnings and real material prices to pick up unexpected increases in costs, and, similarly, "price competitiveness" (not fully defined), world income and fiscal stance, for reductions in revenue. Simmons, in his study of personal bankruptcies, desegregated his data into four industrial sectors, and used various measures for cost and demand shocks as were appropriate for each sector. Hudson, when considering separately the three types of company liquidations (see below), does not specifically include in his models variables which would influence cost or revenue flows but he does introduce the ratio of company profits to company GDP, which might be construed as a surrogate for net present values, and, for the models of the number of voluntary liquidations, the ratio of unfilled vacancies to registered unemployed, as a proxy for the opportunity cost of being self-employed.

Hence, Wadhvani and Simmons, and to a more

limited extent Hudson, employ variables which, arguably, could be pertinent even in the absence of imperfections in the capital market in so far as changes in cost and revenue flows may not be anticipated and lead to failure. Indeed, even if they could be anticipated it is by no means clear that the effects of severe adverse changes could necessarily be avoided, especially by marginal firms and in the presence of fixed costs. Generally speaking the shock variables were statistically significant, at the normally acceptable levels, and of the appropriate sign. As the data was not standardised, however, it is not possible to infer the relative importance of the variables in influencing failure.

The implication of the variables discussed above, and of the models formulated by Argenti (1976), Jovanovic (1982) and Dunne, Roberts and Samuelson (1988) is that firms fail because they are unlucky or inefficient. A separate tradition focuses attention on the role of the capital market in the failure process. This has three strands. The first, which is particularly common within the British literature, argues that the capital market simply does not serve the small firm sector very well. Few elements of the market escape criticism (see Hall, 1989, for a recent survey of the literature) but banks are the institutions most likely to be able to influence the probability of survival of small firms. They have been accused of charging small firms too much, demanding too high a level of security, conservatism in their attitudes to the purposes for which they will make loans and inefficiency in their procedures for credit assessment (Wilson, 1979; Robson Rhodes, 1983a, 1983b, 1984).

Wadhvani (1986) has initiated a second strand of argument as to how the capital market might be linked to the incidence of corporate failure by rigorously analyzing the effects of inflation in the presence of credit rationing. His model hinges on an inability to index-link debt. Firms, therefore, are unable to compensate through additional borrowing, for the accelerated real repayment which characterises borrowing under inflation (a phenomenon familiar to all holders of mortgages in Britain).

Wadhvani did not introduce inflation as a variable but, as predicted by his model, found interest rates to be positively correlated with the number of liquidations. This result is contradicted by that of Hudson (1986), employing liquidations

desaggregated by legal category as a dependant variable, and by Simmons (1989) in his study of personal bankruptcies.

A negative relationship would be consistent with Stiglitz and Weiss (1981) who argue that, as interest rates rise, only companies with a low elasticity of demand with respect to the price of debt will apply for loans. This would include firms fearing insolvency. Hence, the splendid piece of counter-intuition that high interest rates might actually be of benefit to firms in distress.

The third set of arguments as to how the capital market might be related to corporate failure is usually identified with Van Horne (1976) and Bulow and Shoven (1978). The former utilises a multi-period state preference model to analyze the optimal time for debt-holders, in general, to instigate insolvency proceedings. The latter consider the appropriate juncture for banks, specifically, to force insolvency in the face of conflicts of interest with stockholders and bondholders on the assets and income flows of firms, with Hudson (1986) extending the argument to include trade creditors. Much depends upon the priority rules that the law applies, with the most economically efficient form of law being considered by White (1989). However, whilst under both U.S. and British law it is perfectly possible for banks to force insolvency upon a firm the going concern value of which exceeds that from liquidation, and vice versa, it is only likely that firms in distress will suffer from such an anomaly. Banks may pull out the plug from the life support system but, in this case, would not be the cause of firms being in need of such support.

The final field of study which is of relevance to this paper is that of patterns of entry, exit and growth (Evans, 1987a, 1987b; Hudson, 1986; Philips and Kirchhoff, 1989; Dunne, Roberts and Samuelson, 1988, 1989). These may be at plant level but it is interesting to compare the characteristics of exiting subsidiaries with those of exiting independents.

Particularly revealing is Dunne, Roberts and Samuelson (1988). Single plant firms are far more prone to exit, and, presumably, liquidation, than subsidiary plants. This may reflect the latter benefiting from experience existing elsewhere in their organisations, which would not be inconsistent with Jovanovic (1982). Alternatively it might serve as evidence of the tolerance towards poor per-

formance displayed by internal capital markets. A second point of significance is that, over time, rates of exit are correlated, and rates of entry are correlated, implying that some sectors display consistent differences in their degree of riskiness and, others in their degree of attractiveness. Furthermore, for any sector, periods of high entry are also periods of low exit with the positive correlation occurring between entry in one period and exit in the next, either because this is the time it takes for unsuccessful new entrants to realise their mistakes or for the impact on incumbents of new entry.

III. Small firms as limited portfolios

In addition to the factors discussed above there are two further aspects of small firms which will increase their vulnerability to failure. Either will increase the likelihood that small firms will face density functions of earnings with lower expected returns and higher variances than those of large firms.

The first concerns the nature of their opportunity-sets with respect to the products or services they offer or markets in which they operate. The degree of diversification, in either sense, will be likely to increase with size of company. As it increases there will be a concomitant reduction in risk of failure. This is merely a reiteration of elementary financial portfolio theory. Where product-market portfolios differ from financial is that the former may be affected by either economies of scale or scope. The former will narrow the opportunity-set presented to small firms, the latter will reduce, even remove, the risk-return trade-off.

This represents one reason for small firms facing the possibility of both lower expected returns and a higher variance of earnings. The second reason is that the volume of human capital embodied in their management will be lower. The well established correlation between the remuneration of chief executives and the size of their companies may, arguably, be interpreted as reflecting the price that must be paid for higher quality. Certainly the breadth of management skills within companies will be related to size, at least up to some asymptote.

A result of this lower volume of human capital is that the income streams that it generates may be

both lower and more sensitive to the situation being faced. The latter arises when the level and range of skills possessed by management are adequate for some situations but not others. Volatility can arise because of changes in any of the myriad influences on revenue and cost streams. The skills appropriate for managing one set of situations (which may be adverse or potentially beneficial) may be inappropriate for another and whether this is so may, in turn, be affected by the characteristics of markets or segments of markets, whether defined by attribute or by geography.

The most appropriate skills may also vary over time. Characteristics of individual markets can change but so, too, can economic, even cultural, environments. Casual empiricism would suggest a decline in demand from the clients of major UK business schools for courses on man-management, particularly industrial relations, and an increase in demand for courses on managing change and on environmental issues. It is likely that the skills most appropriate for survival will vary even within the early life of a firm. At the pre-launch stage it is essential that founders are able to ensure a sufficient supply of capital, which usually means being able to negotiate with banks, and that they should be able to assess the viability of the proposed business. If the forecasts that this implies do not prove over-optimistic, and if conditions remain stable, then post launch, the founders must be able to demonstrate a minimum level of competence across the range of dimensions of running a business. The longer the business is in existence, however, the more likely that conditions will turn out differently from those originally expected. Instability may also arise in the personal circumstances of owners. A further effect of the lack of depth in management within a small firm is that, for instance, the serious illness of one of its senior managers may jeopardise its survival to an extent that would never be expected within a large firm. Apart from this possible effect of personal problems on the running of a business, within the early stages of a firm one would expect to observe different reasons for failure. The problems confronted at each stage may vary, with corresponding differences in the skills needed to manage these problems.

IV. Empirical results

This paper draws on a previously untapped source to throw fresh light on the factors associated with failure in the hope of providing further clues as to the relative importance of the reasons discussed in the sections above. The source is the reports of the British Official Receiver (O.R.) which British law requires be made on each case of involuntary insolvency.

Elsewhere (Hall and Young, 1991) it has been argued that the characteristics of companies suffering compulsory liquidation are unlikely to differ markedly from those experiencing creditor's voluntary liquidation. Whilst the latter will be reached with the agreement of owners, this may be intended to pre-empt the court order implied by the compulsory liquidation. Creditors', voluntary and compulsory liquidation accounted, in 1972, for 72% of notifications to start liquidation proceedings. The balance consisted of members' voluntary liquidation in which the initiative comes from owners. It is not possible to ascertain the extent that the characteristics of companies opting for members' voluntary liquidation match those pursuing either of the other routes.

Occasionally, reports contain details of, for instance, the history of profits earned by the failed company or the salary taken by its owner, which, if provided in sufficient volume, would have been of immense value, but we faced little alternative to limiting our attention to information that is usually presented:

year of insolvency
years traded
sector in which trading took place
value of assets at time of insolvency
amount owed at insolvency
type of creditor
reasons for failure as perceived by the owner
reasons for failure as perceived by the O.R.

Hall and Young (1991) reported preliminary results based on a sample of insolvencies within the London area. Here, the full results are shown for 1064 cases desegregated into 278, 385 and 401 for 1973, 1978 and 1983 respectively and 300, 243, 258 and 263 for London, the Midlands, North West and South West, respectively.

It was originally intended to draw a sample of

300 cases for each region from each year but, outside of the London area, records pre-1983 have not always been fully maintained. It should be noted that the 1985 Companies Act considerably reduced the information contained in O.R. reports and comparisons with more recent years therefore are not possible.

All values have been inflated to their equivalent at 1988 prices.

Size and insolvency

For the 738 cases that supplied such information ($N = 738$) the mean value of their assets at the point of insolvency was £54,767, the median £6,319 and the standard deviation £184,127. Only seven had assets of above £1,000,000 and the maximum was £2,870,000.

The owners of failing firms might be expected to dispose of whatever assets they can before the instigation of formal insolvency proceedings. Turnover in prior years would be a more reliable measure of the size of the failed companies, but this is usually not supplied at all or, if so, only idiosyncratically within the five years prior to insolvency. The most commonly cited year ($N = 307$) is the third before insolvency. One might expect that only the largest firms would supply such information, but the mean value of revenue was, nevertheless, only £650,000, the median £205,000 with the standard deviation £1,223,000. The maximum was just over £11,000,000.

A more comprehensive ($N = 1050$) but indirect indication of size is the amount owed at insolvency, i.e., the amount not secured against assets. The mean was £414,000, the median £47,000 and the standard deviation £3,271,000, reflecting the outlier maximum of £60m, though in only twenty-nine cases was more than a million pounds owed. Clearly, only small firms would fail for such generally small amounts, as would be predicted by most theory and, as has been shown by all previous studies; failure is almost entirely confined to the small firm sector.

It is possible that over time changes have taken place in the distribution by size of failures, perhaps because a change has occurred in the critical growth path suggested by Jovanovic (1982). When the amount owed is banded into < £50,000, £50,000–£99,999 and £100,000 + this hypothe-

sis is rejected at 0.05% on a χ^2 distribution. In real terms, the distribution of the levels of debt faced by insolvencies, and, therefore, by implication, the distribution of their sizes, did not change between 1973 and 1983.

Given that the minimum efficient scale will vary across sectors one would expect corresponding differences between sectors in the average size of insolvencies. Maintaining the same bands as above and the surrogate of amount owed for size this hypothesis is not rejected at 0.05% on a χ^2 distribution (see Appendix I).

If we arbitrarily adopt the rule of thumb that differences between observed and expected frequencies are noteworthy if ± 5 , a convention we will maintain throughout this paper, there is a bias towards smaller firms failing amongst general merchandisers and those operating in construction. Property/land developers and manufacturers are likely to be bigger whilst retailers display a bias towards the middle band.

As will be shown below, there are regional differences in the numbers of insolvencies occurring across industrial sectors and this is a possible explanation for the marked differences between regions in the amount owed (see Appendix II). In London and the South West the bias is towards firms being rendered insolvent for the sake of relatively small amounts whilst in the Midlands and North West the reverse is true.

Number of years traded (N = 1064)

The mean life span of the insolvents was 6.79 years, the median 4 years and the standard deviation 8.2 years. 186 had traded for 10 or more years, 30 for 30 years or more and the maximum for 66 years. The mean should be compared to the 2.3 years which Ganguly (1985) derived from VAT registration. Such registrations, as Ganguly readily concedes, provide only an approximate and partial indication of corporate life and, it would seem, an under-estimate of length of life span.

Whilst Jovanovic (1982) does not specify any sort of time frame, a period of almost seven years would be somewhat longer than might be expected before the full impact were experienced of a failure to achieve a critical growth path. This period could conceivably alter over time. On the

other hand, the severity of external shocks, or degree of turbulence in their environment, faced by small firms, could certainly vary between periods. It would appear (Appendix III) that between 1973 and 1983 there has indeed been an increase in the life span of failed firms, and this impression is not rejected at the 0.05% level on a χ^2 distribution.

Differing conditions between sectors are likely to effect the vulnerability to failure of their small firms and this is clearly the case (Appendix IV). Exporters/importers, retailers and general merchandisers display a bias to failure within their first five years of life, companies operating in the professions and construction are susceptible to failure in their first ten years and property/land developers and manufacturers contain a greater incidence of firms surviving over ten years than would be expected from the performance of the total sample.

Given the uneven distribution of sectors across regions one would expect a corresponding difference in the distribution of life spans within regions but this hypothesis is firmly rejected at 0.05% on a χ^2 distribution or, indeed, at practically all other levels (Appendix V).

Sectors in which failure took place

Two features are striking. Firstly, a fifth of the insolvents were builders. Their sector is undoubtedly particularly vulnerable to failure. Secondly, after the building trade there is no single sector displaying a similar obvious vulnerability. For instance, the percentages of the total sample represented by the next seven sectors in which failure was most common were:

Property/Land Developers	6.9
General Merchants	6.0
Manufacturing	5.5
Garage Proprietors	4.5
Haulage Contractors	3.9
Importers/Exporters	3.9
Electrical Engineers	3.8

One would expect that over time changes would have occurred in the distribution of failures between sectors, either because of changes in the relative number of companies operating in each sector, with a corresponding impact on relative

numbers of failure even if the incidence of failure remains unaffected, or because of an uneven reaction to changes in the economic climate or because of differing alterations to conditions facing individual markets. This expectation is borne out (Appendix VI).

Maintaining the convention that observed minus expected frequency of 5(+) or -5(-) should be considered noteworthy this would translate into:

	1973	1978	1983
Property/ Land Developers		+	-
General Merchandisers	-		+
Manufacturing		-	+
Professional Services	+	-	
Construction		+	-

There are marked inter-regional differences in the distribution of failures across sectors, presumably reflecting differences in the distribution of activities, though possibly inter-regional differences in conditions facing each sector influence the incidence of their failure rate (Appendix VII). London clearly has an higher than expected number of failures amongst property/land developers and lower than expected amongst manufacturers. In the Midlands failures are higher than expected amongst exporters/importers and manufacturers, but lower amongst retailers, property/land developers and caterers. In the North West failures were greater than expected amongst manufacturers and lower amongst property/land developers and companies in construction, whilst in the South West caterers and construction companies had more failures than would be expected and exporters/importers and manufacturers less.

Owners perceptions (N = 857)

The majority of O.R. reports contain the perceptions of both the owner and O.R.s of why failure occurred. Each is of interest. Owners are the most closely acquainted with the history of their companies though they may lack the objectivity or expertise to correctly interpret the facts. O.R.s are dispassionate and experienced and can call on the opinions of a range of interested parties such as the company's solicitor, bank or supplier. How-

ever, the O.R.s accountancy training may create the bias that may be expected from a background in any management discipline. From the necessity of brevity only the opinions of owners have been reported.

One might have expected a bias in owners' responses to factors which could be construed as beyond their control — environmental, the behaviour of partners, rises in costs — but Table I does not suggest this. Overwhelmingly, owners identified problems in operational management as the major reasons for their failure and, of these, undercapitalisation figured as most important, followed by poor management of debt. Strategic issues come some way behind operational man-

TABLE I
Reasons for failure — Owners' perceptions

<i>Operational Management</i>	
Undercapitalisation	235
Poor management of debt	111
Inaccurate costing & estimating	34
Poor management accounting	23
Poor supervision of staff	8
Overstocking	7
Late delivery of materials	6
Loss of experienced personnel	3
Skill shortages of staff	7
	434
<i>Strategic</i>	
Lack of demand for products	66
Funding associated companies	44
Reliance on a few customers	28
Competitor behaviour	27
Reliance on a few suppliers	11
New entrants into market	1
	177
<i>Environmental</i>	
High interest rates	37
Fire	14
Theft	10
Exchange rates	2
Flood	1
	64
<i>Personal</i>	
Disagreement with partners	26
Ill health	21
Excessive remuneration	15
	62

Table I (Continued)

<i>Technological</i>	
Inferior product	25
No previous knowledge or experience	17
Use of inferior materials	7
Inferior plant	4
	53
<i>Marketing</i>	
Poor forecasting	30
Under pricing	10
Adverse publicity	4
Over pricing	2
	46
<i>Rises in</i>	
Overhead costs	11
Operating costs	4
Fixed costs	2
Labour costs	2
Material costs	2
	21

agement in importance, but with a very strikingly low weighting attached to competitor behaviour, new entrance or uneven portfolio of customers. Even lack of demand was cited by less than 8% of owners.

Weaknesses in technology, broadly defined, an area in which the British are generally acknowledged to be weak, does not appear to have been important, presumably because small firms usually only compete in domestic markets. Equally, marketing is not acknowledged as posing major problems, though whether this is testimony to the marketing skills of owners or to their ignorance of its importance is open to debate.

If any weight is to be attached to the opinions of owners, aggregated across all types of category, it would not appear that external shocks played as important a part in their failure as the amount of capital they had secured or their management of debt. Undercapitalisation can reflect an inefficient capital market or an inability by founders to predict their capital needs or to successfully negotiate with their sources of capital.

When the sample is desegregated by size, the owners of firms with unsecured loans of less than

£50,000 were more likely than expected to ascribe their failure to technological or personal problems and less likely to operational, strategic and environmental, and vice-versa, firms owing above £100,000 (Appendix VIII). This would suggest that it was the owners of the smallest firms who were most ready to acknowledge the inadequacy of their products and who were the most vulnerable to the limitations of their managerial portfolio.

Some support for this interpretation is supplied by the differences in reasons for failure provided at different ages of the companies (Appendix IX). Re-adopting the rule of thumb that a difference between observed and expected of ± 5 is deemed noteworthy reveals:

	< 5 Years	5—9 Years	10+ Years
Operational	+	—	—
Strategic	—	+	+
Technological	+		—
Marketing	+		
Personal	—		
Environmental	—		+

It would appear that the owners of young firms were more likely to suffer from inadequate funding, poor products and inefficient marketing. As their companies aged, however, they were more likely to be buffeted by strategic and environmental shocks for which they did not have the managerial skills to respond.

Marked differences over time have occurred in the reasons given for failure (Appendix X):

	1973	1978	1983
Operational	+	+	—
Strategic		—	+
Personal	+		
Environmental	—		+

The oil price increases of the early 1970s would appear to have been reflected in operational problems, conceivably even personal rather than in those factors here classified as environmental. The 1980s, on the other hand, would appear to be characterised by both an increase in the severity of external shocks, strategic and environmental, and by an improvement in the operational management of companies.

There are significant differences between regions in the distribution of reasons given by

owners for their failure (Appendix XI). In London, strategic and technological reasons figured much higher than would be expected and operational management lower. In the Midlands operational management was higher and marketing lower. In the North West, marketing and personal problems were higher, and operational management lower, whilst, in the South West, operational management was higher than expected.

These differences could reflect variation between regions in a host of dimensions, the most obvious being the distribution of sectors. It is not possible to state, however, with any certainty whether there are statistically significant differences in the distribution of reasons across sectors (Appendix XII). There are too many cells with an expected value of less than five to allow an assumption of a χ^2 distribution. Nevertheless there do appear to be some marked differences, presumably as a result of differences between sectors in their characteristics. Retailers cited problems in marketing more than would be expected, property/land developers cited environmental problems more and operational less, caterers operational less, professionals marketing more, and construction companies operational problems more, but strategic, marketing and environmental less.

Concluding remarks

Apart from disagreement between Wadhvani (1986) and Stiglitz and Weiss (1981) as to the effects of high interest rates on the number of insolvencies, the various theories for their number discussed in this paper are not incompatible. Given that each probably contains some element of truth, it is their relative importance that needs to be resolved.

The evidence presented here would suggest that about half of the owners of failed firms in the three periods covered put the blame for their failure on operational reasons with factors which, broadly speaking, might be interpreted as shocks, figuring as relatively unimportant. Undercapitalisation was perceived as instrumental in causing their failure by over a quarter of the sample. The fault may perhaps lie with their inability to predict their capital requirements, perhaps with inefficiency in the capital market.

Clearly these aspects of corporate failure are areas open for further research. Any new work, theoretical or empirical, might also usefully encompass the various relationships suggested above: — for instance of size at failure with sector and region, of age with period, sector and region, and of perceived reasons with size, age, region and, perhaps, sector.

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Appendix I

Size (total owed) by sector

	Exporters/ Importers	Retail	Property/ Land developers	General merchandising	Catering	Manufacturing	Professional services	Construction	Other
< 50,000	29 (26.9)	42 (45.0)	41 (41.9)	44 (35.2)	25 (24.8)	35 (53.8)	37 (32.6)	235 (228.6)	55 (54.3)
50,000–	11	25	13	8	11	19	10	96	24
99,999	(10.7)	(18.0)	(16.7)	(14.1)	(9.9)	(21.5)	(13.0)	(91.3)	(21.7)
100,000	12 (14.4)	20 (24.0)	27 (22.4)	16 (18.8)	12 (13.3)	50 (28.7)	16 (17.4)	111 (122.1)	26 (29.0)

$X^2 = 37.5$; Sig = 0.02; N = 1050.

Appendix II

Total deficiency by region

	< 50,000	50,000—99,999	100,000+
London	166 (148.9)	53 (59.5)	69 (79.5)
Midlands	110 (125.1)	49 (50)	83 (66.8)
N.W.	123 (132.9)	57 (53.1)	77 (71)
S.W.	144 (136)	53 (54.4)	61 (72.6)

 $X^2 = 13.9$; Sig = 0.03; $< 5 = 0$; N = 1050.**Appendix III**

Number of years traded by year of insolvency

Years	1973	1978	1983
< 5	164 (149.2)	220 (206.6)	187 (215.2)
5—9	60 (69.8)	104 (96.6)	103 (100.6)
10+	54 (59)	61 (81.8)	111 (85.2)

 $X^2 = 21.2$; Sig = 0.0002; $< 5 = 0$; N = 1064.**Appendix IV**

No. of years traded by sector

	Exporters/ Importers	Retail	Property/ Land developers	General merchandising	Catering	Manufacturing	Professional services	Construction	Other
< 5 years	33 (27.9)	60 (48.3)	24 (44.5)	48 (37)	25 (25.8)	49 (56.3)	37 (34.3)	246 (240.4)	49 (56.3)
5—9	12 (13)	17 (22.6)	22 (20.8)	13 (17.9)	11 (12)	25 (26.3)	20 (16.1)	116 (112.4)	31 (26.3)
10+ years	7 (11)	13 (19.1)	37 (17.6)	8 (14.7)	12 (10.2)	31 (22.3)	7 (13.6)	86 (95.2)	25 (22.3)

 $X^2 = 59.3$; Sig = 0; $< 5 = 0$; N = 1064.

Appendix V

Years traded by region

	< 5 Years	5-9 Years	10+ Years
London	162 (161)	72 (75.3)	66 (63.7)
Midlands	133 (130.4)	59 (61)	51 (51.6)
NW	132 (138.5)	73 (64.7)	53 (54.8)
SW	144 (141.1)	63 (66)	56 (55.9)

 $\chi^2 = 1.96$; Sig = 0.92; < 5 = 0; N = 1064.**Appendix VI**

Year of insolvency by sector

	Exports/ Imports	Retail	Property/ Land developers	General merchandising	Catering	Manufacturing	Professional services	Construction	Other
1973	11 (13.6)	19 (23.5)	24 (21.7)	13 (18)	10 (12.5)	25 (27.4)	22 (16.7)	116 (117.1)	38 (27.4)
1978	20 (18.8)	37 (32.6)	40 (30)	22 (25)	17 (17.4)	29 (38)	17 (23.2)	178 (162.1)	25 (38)
1983	21 (19.6)	34 (33.9)	19 (31.3)	34 (26)	21 (18.1)	51 (39.6)	25 (24.1)	154 (168.8)	42 (39.6)

 $\chi^2 = 36.2$; Sig = 0.003; < 5 = 0; N = 1064.**Appendix VII**

Sectors by region

	Exports/ Imports	Retail	Property/ Land developers	General merchandising	Catering	Manufacturing	Professional services	Construction	Other
London	15 (14.7)	27 (25.4)	50 (23.4)	20 (19.5)	13 (13.5)	17 (29.6)	21 (18)	123 (126.3)	14 (29.6)
Midlands	17 (11.9)	13 (20.6)	8 (19)	15 (15.8)	5 (11)	38 (24)	14 (14.6)	100 (102.3)	33 (24)
NW	14 (12.6)	25 (21.8)	7 (20.1)	17 (16.7)	10 (11.6)	36 (25.5)	15 (15.5)	101 (108.6)	33 (25.5)
SW	6 (12.9)	25 (22.2)	18 (20.5)	17 (17.1)	20 (11.9)	14 (26)	14 (15.8)	124 (110.7)	25 (26)

 $\chi^2 = 105$; Sig = 0; < 5 = 0; N = 1064.

Appendix VIII

Size (total owed) and directors' reasons

£	Operational management	Strategic	Costs of production	Technological	Marketing/ sales	Personal	Environmental
< 50,000	205 (213.8)	78 (86.6)	12 (12)	36 (26.5)	23 (23)	44 (31.5)	27 (31.5)
50,000— 99,999	86 (88)	39 (35.7)	10 (4.9)	8 (10.9)	12 (9.5)	11 (13)	9 (13)
100,000+	136 (125.2)	56 (50.7)	2 (7)	9 (15.5)	11 (13.5)	8 (18.5)	27 (18.5)

 $X^2 = 36.8$; Sig = 0.0002; $< 5 = 1/21$; N = 849**Appendix IX**

Directors' reasons and number of years traded

Years	Operational management	Strategic	Costs of production	Technological	Marketing sales	Personal	Environmental
< 5	243 (229.8)	80 (94.6)	15 (12.8)	40 (28.3)	30 (24.6)	28 (33.7)	22 (34.2)
5—9	107 (112.4)	52 (46.3)	4 (6.3)	11 (13.9)	9 (12)	21 (16.5)	20 (16.7)
10+	80 (87.8)	45 (36.1)	5 (4.9)	2 (10.8)	7 (9.4)	14 (12.9)	22 (13.1)

 $X^2 = 36.6$; Sig = 0.0003; $< 5 = 1/21$; N = 857.**Appendix X**

Directors' reasons and year of insolvency

	1973	1978	1983
Operational	118 (112.9)	197 (167.6)	115 (149.5)
Strategic	44 (46.5)	45 (69)	88 (61.5)
Costs of production	5 (6.3)	10 (9.4)	9 (8.3)
Technological	16 (13.9)	22 (20.7)	15 (18.4)
Marketing/Sales	12 (12.1)	14 (17.9)	20 (16)
Personal	22 (16.5)	22 (24.6)	19 (21.9)
Environmental	8 (16.8)	24 (24.9)	32 (22.3)

 $X^2 = 47.8$; Sig = 0; $< 5 = 0$; N = 857.

Appendix XI
Directors' reasons by region

	Operational management	Strategic	Costs of production	Technological	Marketing sales	Personal	Environmental
London	93 (115.9)	56 (47.7)	11 (6.5)	21 (14.3)	10 (12.4)	21 (17)	19 (17.3)
Midlands	117 (101.9)	39 (41.9)	5 (5.7)	14 (12.6)	3 (10.9)	10 (14.9)	15 (15.2)
NW	98 (107.9)	42 (44.4)	6 (6.0)	10 (13.3)	19 (11.5)	22 (15.8)	18 (16.1)
SW	122 (104.4)	40 (43.0)	2 (5.8)	8 (12.9)	14 (11.2)	10 (15.3)	12 (15.5)

$X^2 = 44.1$; Sig = 0.0005; $< 5 = 0$; N = 857.

Appendix XII
Directors' reasons by sector

	Importers/ Exporters	Retail	Property/Land developers	General merchandising	Catering	Manufacturing	Professional	Construction	Others
Operational management	17 (21.6)	36 (39.1)	25 (33.1)	25 (27.1)	10 (15.6)	48 (45.7)	19 (22.6)	209 (180.1)	41 (45.2)
Strategic	11 (8.9)	17 (16.1)	11 (13.6)	12 (11.2)	9 (6.4)	20 (18.8)	11 (9.3)	64 (74.1)	22 (18.6)
Costs of production	1 (1.2)	5 (2.2)	0 (1.8)	1 (1.5)	1 (0.9)	3 (2.5)	2 (1.3)	8 (10.1)	3 (2.5)
Technological	4 (2.7)	5 (4.8)	5 (4.1)	4 (3.3)	1 (1.9)	6 (5.6)	0 (2.8)	24 (22.2)	4 (5.6)
Marketing/sales	1 (2.3)	9 (4.2)	3 (3.5)	4 (2.9)	1 (1.7)	2 (4.9)	8 (2.4)	11 (19.3)	7 (4.8)
Personal	3 (3.2)	4 (5.7)	4 (4.9)	8 (4.0)	4 (2.3)	6 (6.7)	4 (3.3)	26 (26.4)	4 (6.6)
Environmental	6 (3.2)	2 (5.8)	18 (4.9)	0 (4.0)	5 (2.3)	6 (6.8)	1 (3.4)	17 (26.8)	9 (6.7)

$X^2 = 113.6$; Sig = 0; $< 5 = 32/63$; N = 857.

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