

# **A Study of Small Businesses in the Northern Region of England: Developing a Taxonomy of Small Firm Growth and Development**

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## **Introduction**

There can be little doubt about the importance of small firms to economy of the United Kingdom economy. The Bank of England (1997) has shown that there were an estimated 3,706,078 businesses in the United Kingdom. Of these, the vast majority, some 99.6%, were businesses employing fewer than 100 workers and were responsible for 53.6% of total employment and 44.3% of the total turnover of the economy. Unsurprisingly, therefore, particularly given the importance of small businesses as wealth and job generators (Gallagher et al., 1990; and Daly, 1990), public policy in the United Kingdom has concentrated upon attempting to support the small firm sector of the economy. Unfortunately, given the diversity of small businesses, the incomplete nature of the data on small businesses, and the variety of ways in which small businesses are defined (Bolton, 1971; Companies Act, 1985; the European Union (Storey, 1994a); and Keasey & Watson, 1993) such a strategy has been difficult to operationalise.

Even so, various attempts to model small business have been pursued. Casson (1982), for example, drawing upon the legacy of neo-classical theory, has attempted to model the entrepreneurial firm based upon the supposed superior knowledge of the individual entrepreneur of the market place. However, whilst this model may be useful for explaining the nature of a particular type of small businesses, it is clear that not all small businesses are run by entrepreneurs. Similarly, although Williamson's (1985) work on transactional cost economics has provided useful insights into the 'price' of using markets and the reasons why firms integrate vertically, it is less clear on how businesses manage themselves internally (Demetz, 1993; and Casson, 1996).

Given these problems, it is not difficult to see the enduring appeal of life-cycle theory as a predictive model of small business organisation and behaviour. This is largely because in its very inclusivity, life-cycle theory provides a ready heuristic tool for measuring businesses and mapping out potential difficulties. However, with some exceptions, much of the work done in the life-cycle paradigm has been conceptual rather than empirical. Hence, in this exploratory paper, based upon a study of small businesses in the Northern Region (Cleveland, Cumbria, County Durham, Northumberland and Tyne & Wear), the intention is to explore, through Scott & Bruce's (1987) life-cycle model of small businesses, the following hypotheses:

H<sub>0</sub>: that a life-cycle model of small firms, based upon cluster analysis, can be developed.

H<sub>0</sub>: that this empirically based taxonomy has a uniform structure.

In order to achieve this, the paper first explores the literature on life-cycle theory, with particular reference to Scott & Bruce's (1987) model. Thereafter, the nature of the current research is explained, before turning to the development of a taxonomic structure and the subsequent results of this process.

## **Life-Cycle Theories**

Life-cycle theory has many advocates: Greiner (1972), Kimberley & Miles (1980), Galbraith (1982), Churchill & Lewis (1983), Quinn & Cameron (1983), Miller & Friesen (1984), Flamholtz (1986), Scott & Bruce (1987), Kazanjian (1988), and Adizes (1989). All of these examples have, in a variety of forms, suggested that businesses "develop patterns of organisation structure in response to common growth and market challenges. Failure to adequately adapt organisation systems and processes results in growth crises, or growing pains which can stall or thwart the growth process" (Hanks et al, 1993: 7). Subsequently, whilst each of them has a distinctive emphasis (the main difference is usually the number of stages a firm passes through from cradle to grave), all share a concern for organisational structures and contexts.

An example of this, primarily taken because it focuses upon small businesses is the model developed by Scott & Bruce (1987). For them the life-cycle of a small business can be said to have five stages:

- i) inception;
- ii) survival;
- iii) growth;
- iv) expansion;
- v) maturity.

The start of the process (inception) Scott & Bruce suggest that businesses, which are invariably young and mature, have a basic organisational structure driven on by the entrepreneurial owner-manager. As they become increasingly larger and more mature, Scott & Bruce suggest, there is likely to be an increase in organisational complexity with, ultimately, decision-making and decision monitoring becoming incrementally separate activities. This almost linear movement, however, is only possible if small businesses are able to cope with periods of 'crisis' brought about by factors internal or external to the business. Failure to negotiate such crises may lead to young small businesses failing to reach the survival stage or, if they pass this stage, failing to reach the expansion stage.

Such a model, like similar life-cycle models, has been subject to criticism. For example, Wynarczyk et al (1993) have pointed to the evidence that not all businesses follow the path suggested by life-cycle theorists. Perhaps a major rationale for such scepticism is that, as Stanworth & Curran (1973) have shown, the principle reason why many small firms come into existence and continue, at whatever level, is that the owner-manager's value is often not growth per se but the independence gained from running a business. Other critics, such as Hakim (1989), have also criticised the use of such a model because, amidst the diversity of small businesses, it is extremely difficult to differentiate *substantively* what constitutes a small business.

However, notwithstanding the validity of these critiques, it does appear that life-cycle theory has, at least, an intuitive logic: firms do come into existence; face crises; grow; mature; and eventually stagnate. Life-cycle theory has also, as Burns & Dewhurst (1989), Kagan et al (1990) and Chell & Haworth (1992) have demonstrated, provided useful conceptions of the ways in which firms need to respond to internal and external challenges. Moreover, with the use of statistical techniques such as cluster analysis, researchers such as Birley & Westhead (1990), Hanks et al (1993) and Westhead (1995) have attempted to develop empirical taxonomic structures of various types of business at different stages in their evolution. Unfortunately, studies such as these have concentrated upon particular types of firms (high technology firms), corporate business (Miller & Friesen, 1983) or particular aspects, such as stages of information need (Holmes et al, 1988). Hence, this study, in examining the worth of the life-cycle model, utilises a broader range of small businesses and also attempts to concentrate on 'smaller' sized businesses with limited turnover and employment levels.

## **Methods**

The sample frame consisted of a sample of small businesses in the Northern Region of England (Cleveland, Cumbria, County Durham, Northumberland and Tyne & Wear) drawn from the Yellow Pages Directory. Inclusion in this directory is based upon the business having a telephone line and, therefore, since it is unlikely that there are many businesses without a telephone, such a directory is likely to include those micro-businesses (who are often missed in official statistics) and recent start-ups. Additionally, as the directory collects self reported information on employee size and the principal industrial sector of a business, it was possible to construct a stratified

random sampling frame based upon geographical area, industrial activity and employee numbers.

The draft questionnaire, upon which the subsequent questionnaire was based, was extensively pre-tested through eight qualitative interviews with small business owner-managers in the Northern Region. Draft questionnaires were also sent out to a random stratified sample (based upon employee numbers and industrial sector) of fifty small businesses in County Durham. Based upon these returns and the qualitative interviews, the content, ordering and terminology of the questionnaire was subsequently revised. The finalised questionnaire was mailed in September 1996 to 1270 small business owner-managers. One month later, those owner-managers who had not responded to the initial mail-out were sent another copy of the questionnaire.

From these two questionnaires, 336 usable returns (26.5%) were received. Thereafter, a random sample of 200 non-responding small businesses was undertaken and from the returns (45%) it was discovered that the principle reasons for non-response were: respondents did not have the time to fill in the questionnaire (41.6%); that their business was part of a larger business (24.7%); and that they felt the information requested from them impinged on their confidentiality (11.2%).

In order to test for response bias, responding and non-responding owner-managers were compared, using a Chi-square statistic with the number of employees in each business. Subsequently, the hypothesis that the groups were drawn from the same population was not rejected ( $\alpha = 0.05$ ). This, in addition to the number of usable responses and the suitability of respondents (81.5% indicated they were owner-managers) would suggest that response bias is not a serious problem and does not jeopardise the validity of the results.

## Sample Characteristics

Respondents were asked to characterise their business in terms of age, industrial sector, geographic location, size (measured in terms of their self-reported number of employees), legal form of business, and turnover. Unsurprisingly, for each of these indicators there was a great deal of variation between respondents. In terms of age, although the average was 29 years, businesses actually ranged from recent start-ups (1996) to a business that was 247 years old. Similarly, respondents self-reported that their businesses operated in a variety of industrial sectors with consumer services (23.8%), manufacturing (20.5%) and wholesale services (17.6%) being the most common. The other sectors, professional services, and construction (both 14.9%) and agriculture (6.8%) were also important. The range of geographic location amongst respondent also demonstrated variation with Tyne & Wear (31.3%), Cumbria (24.1%) and County Durham (18.2%) being more common than Cleveland (15.8%) and Northumberland (10.97%). However, when compared against the Yellow Page's database of the population of small businesses for these five counties of the Northern Region, using a Chi-square test, it was found that the null hypothesis was not rejected (p. 0.05) and that respondent's geographical location was normally distributed.

As for size, turnover, and the legal form of business, Table 1 illustrates that the majority of business, whilst likely to be limited companies, had limited turnovers and workforces. Further exploratory cross-tabulations between these three variables further demonstrated, as may be hypothesised, that there is a link between business age, size, turnover and legal form of business. For example, in terms of turnover, those respondents with the lowest turnover (<£100,000) uniformly employed the fewest employees (1-9 employees). Similarly, respondents with larger workforces (20-49 employees) were much more likely to be limited companies (77.1%) than partnerships (17.1%) or sole traders (4.3%). Moreover, subsequent multiple comparisons (p. 0.05), using the more robust Scheffe test (Black, 1994), between number of employees and the legal form of businesses indicated that those who employed 1-9 employees were significantly more likely to be sole traders than partnerships, limited companies or co-operatives.

This clarity, though, becomes less transparent when multiple comparisons, using the Scheffe test, are used to account for the variance between business age and size, turnover levels, and the legal form of the business. Hence, rather contrary to the expectations, the Scheffe test is unable to point to variance (p. 0.05) between size of business and turnover with business age. Furthermore, whilst there is variation between business age and the legal form of business, the statistical differences were between co-operatives and sole traders/partnerships rather than between limited companies and other forms of organisational structure. Similarly, although a Scheffe test is able to indicate that there is a significant difference between ‘micro’ employers and larger businesses with higher turnovers, it was also clear that there were significant pairwise differences between turnover levels and number of employees at all levels of employment, which perhaps gives further empirical credence to the belief that small businesses should not be treated, a priori, uniformly.

**Table 1: Analysis of respondents by business size, turnover and legal form of business**

<i>Turnover</i>	<i>No.</i>	<i>%</i>
<£100,000	63	18.8
>£100,001 to £500,000	115	34.2
>£500,001 to £2,400,000	116	34.5
>£2,400,000	42	12.5
Total	336	100.0

<i>Business size</i>	<i>No.</i>	<i>%</i>
1-9 employees	159	47.3
10-19 employees	78	23.2
20-49 employees	72	21.4
50+ employees	21	6.3
Non response	6	1.8
Total	336	100.0

<i>Legal form of business</i>	<i>No</i>	<i>%</i>
Sole trader	61	18.2
Partnership	98	29.2
Limited company	164	48.8
Co-operative	6	1.8
Non response	7	2.1
Total	183	100.0

## Performance Measures

In order to test the uniformity or otherwise of the data, four of the six variables - age, size, organisational form and turnover - were selected. This was because, at a general level, it was considered that geographic location and industrial sector, per se, were less powerful exploratory variables. Subsequently, two of the four remaining variables, age and size, were log transformed to minimise the effect of skewness. In addition to this, two other variables collected in the questionnaire, self-reported change in turnover and change in employee numbers over the last two financial years, were included in the analysis. These measures were considered important because, as Gray & Bannock (1988) have shown with employment growth, such measures are often strong proxies for identifying the growth of particular businesses. The growth or otherwise of the businesses in the sample is detailed in Table 2.

**Table 2: Analysis of respondents by turnover and employment growth**

% Change	Turnover		Employment	
	No.	%	No.	%
-51%	4	1.2	15	4.5
-26% to -50%	6	1.8	25	7.4
-11% to -25%	18	5.4	14	4.2
-10%	48	14.3	3	0.9
no change	78	23.2	178	53.0
10%	90	26.8	17	5.1
11% to 25%	56	16.7	47	14.0
26% to 50%	21	6.3	24	7.1
51% to 100%	6	1.8	12	3.6
100%	2	0.6	1	0.3
Non-response	7	2.1	0	0.0
Total	336	100.0	336	100.0

From Table 2, it is clear that the majority of businesses appear to have remained stable both in terms of employee and turnover change. In analysing this stability and the changes experienced by businesses, however, exploratory cross-tabulations failed, partly due to the unavailability of Chi-square tests, to find any significant degree of association between turnover growth and employment growth and age, size, turnover and legal form of business. In the absence of these, therefore, a

bivariate correlation analysis was performed using a Spearman correlation coefficient (Siegel, 1956). These revealed, as Table 3 shows, that there was, at the 0.05 level, a high statistical association for both employment change and turnover change with size, turnover and between turnover change and employment change. Other variables, such as age and legal form, were less associative, although they, as Table 3 demonstrates, follow for both turnover change and employment change, the general conclusion that the null hypothesis of no association could be rejected.

**Table 3: Bivariate correlation analysis of turnover and employment change with age, size, form and turnover levels**

	Employment change	'r <sub>s</sub> ' significance	<i>n</i>	Turnover change	'r <sub>s</sub> ' significance	<i>n</i>
Age	-0.08	0.15	323	-0.22	0.00	316
Size	0.29	0.00	330	0.17	0.00	323
Turnover	0.26	0.00	336	0.19	0.00	329
Legal form	0.13	0.02	329	0.09	0.10	322
Employment change				0.47	0.00	329
Turnover change	0.47	0.000	329			

Whilst such tests of coefficient are useful they, like univariate or multi-variate analysis, remain confined to the assumptions of linearity: that the combination of variables can be described sequentially. Hence, to overcome this difficulty, cluster analysis (Norusis, 1985) was performed as a means of providing a taxonomy of the businesses in the sample. This was done using Ward's (1963) method of error sums of squares which identifies clusters with maximum between-group variance and minimum within-group variance. Thereafter, a dendrogram was produced which identified six clusters, based upon age, size, turnover, legal form of the business, turnover change and employment change. In order to ensure that such clustering was appropriate, a canonical discriminant analysis was performed of the six clusters and the six variables. Four canonical discriminant functions were significant in differentiating the clusters (*p*. 0.00) and the correlations were, from first to fourth, 0.93, 0.79, 0.55 and 0.24. Subsequently, a cluster centroids analysis was performed and plotted along the first two discriminant functions. As can be seen from Figure 1, these centroids generally display wide between-group separation and limited within-group variation; further reinforcing the results from the discriminant analysis which correctly classified 95% of grouped cases.

### Figure 1: Plot of cluster centroids of the six clusters

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Having developed an appropriate methodology and taxonomic structure, it was possible to provide a descriptive analysis. This was achieved by using the cluster mean for each variable (see Table 4).

**Table 4: Cluster Characteristics of the six clusters**

Variable	Clusters						Overall Mean	Std. dev.
	1	2	3	4	5	6		
Age	2.53	2.83	2.71	3.44	2.58	2.95	2.93	0.91
Size	1.59	2.73	1.06	2.54	1.78	1.22	1.88	0.98
Turnover	2.13	3.33	1.58	2.97	2.29	2.02	2.42	0.94
Form	1.97	2.88	1.83	2.69	2.21	2.25	2.34	0.79
Turnover Change	6.03	7.03	5.57	5.08	6.93	3.33	5.57	1.56
Employment change	8.03	6.97	5.02	4.94	2.21	1.92	5.20	1.88
No. of Business	32	60	89	83	14	36		

## Cluster 1

Cluster 1 had 32 members and was associated with businesses that were, in the majority, formed in the last two decades, with a limited number of employees (1-9 or 10-19 employees), and small turnover levels (< £500,000). They, however, were just as likely to be organised as sole traderships, partnerships or limited companies. What was particularly distinguishing about this cluster, though, was that the small firm members had reported very positive growth in terms of employment. This, unfortunately, was not matched by equally strong growth in terms of turnover, indicating that, for some of them at least, they were experiencing 'crises'.

## Cluster 2

This cluster was nearly double the size of cluster 1 with 62 members. It was comprised of businesses likely to be older than those in cluster 1 and have more employees (20-49) and higher turnovers (< £500,000). Moreover, the businesses in this cluster were predominately organised as limited companies and seemed to have struck a balance between employment growth and turnover growth.

## Cluster 3

Cluster 3 contained the largest number of members (89). In large part, what distinguished this cluster was the stability of both employment and turnover, with the vast majority of firms reporting no growth in employment and only very modest growth in turnover. In terms of organisational structure, this cluster preponderantly comprised sole traders and partnerships. As perhaps may be suggested, these businesses, almost uniformly, had a small workforce (< 19 employees) and limited

levels of turnover (< £500,000). Where they did vary was in terms of age as the majority were businesses that were older than the 'growing' younger firms of cluster 1.

## **Cluster 4**

This cluster was similar to cluster 3 in many ways: membership was strong (83) and both turnover growth and employment growth showed similar signs of stability. However, where this cluster did differ was that in terms of age, employee numbers, organisational form, and turnover levels, member businesses were older (average age 45 years), bigger (20-49 employees), predominantly limited companies and had larger turnovers (£500,000 - £2,400,000).

## **Cluster 5**

Cluster 5 with only 14 members was the smallest configuration. The distinguishing features of this cluster were the strong positive growth in turnover and a strong negative decline in numbers employed. The businesses sharing these attributes were, however, not confined to particular turnover levels, ages or types of organisation. If anything, with the exception of number of employees (businesses in this cluster largely employed fewer than 10 people), each of the businesses were just as likely to be young sole traders with limited turnover as older limited companies with relatively high turnover levels.

## **Cluster 6**

Businesses in this cluster (36), were mostly small employers (1-9 employees) with limited turnovers (< £500,000). Generally, however, they were not young businesses (average age 20 years) and more likely to be limited companies than partnerships or sole traders. Beyond these features, what characterised this cluster above all else was the negative decline in both turnover growth and employment growth.

## Summary and Discussion

From the evidence presented, it would seem clear that, using powerful statistical techniques such as cluster analysis, it is feasible to provide a distinct taxonomic structure of small businesses based upon age, size, form, turnover and changes in turnover and employment levels. Furthermore, it is also possible to see in the six clusters clear variations in growth between growth (clusters 1 and 2), stability (clusters 3 and 4) and decline (cluster 5 and 6). This empirical taxonomy, however, does not fit in with traditional conceptions of the life-cycle theory suggested by Scott & Bruce (1987). This is largely because, from the evidence presented here, small businesses do not develop sequentially. For example, although two distinct 'stable' clusters (cluster 3 and 4) could be identified, each with particular characteristics, it does not necessarily follow that businesses in these clusters are of a particular age, size and so forth. Instead, it seems clear that the taxonomy developed here empirically supports the notion of other researchers (Wynarczyk, et al., 1993) who contend that businesses do not develop in the linear way suggested by life-cycle theorists. Moreover, it is just as possible that businesses that seem to be declining (clusters 5 and 6) may reverse their fortunes and grow rather than decline as suggested by life-cycle theory.

If, as has been argued here, the sequential nature of life-cycle theory is not robust, is it still possible to identify businesses at particular points? Superficially, at least, this seems evident. For instance, developing on the growth clusters (cluster 1 and 2), it would seem that it is possible to identify growth businesses of different ages and sizes. Subsequently, using this data as a heuristic tool, it may be further possible to predict growth businesses that have the potential to further increase their growth. This process, if possible, would provide a positive platform for public policy and help shape the provision of support to small businesses.

The use of this more ad hoc and sensitive heuristic process has been supported by Storey (1994b). He suggests that as only a tiny minority, some 4 per cent, of small businesses in the United Kingdom grow, public policy should concentrate upon identifying and 'picking winners' amongst this minority, using age, number of employees (> 20 employees) and organisational form (independent businesses) and seeking to provide these businesses with "managerial assistance to the firm over a short time period to enable a specific constraint to be overcome" (p. 16). This policy, what Scott & Bruce would regard as helping businesses to overcome 'crises', has recently become part of public policy in the United Kingdom, through the network of Business Link agencies.

However, whilst there is distinct evidence from this paper that there are businesses which could be categorised in this manner, it is also apparent that such categories may not be as unequivocal as they appear. Take, for example, cluster 5. Businesses in this apparently 'declining' cluster, would be similarly labelled by Storey (1994b) largely due to the sharp reduction in the workforce of these businesses. However, turnover change, which is positive, seems to confound this analysis and, furthermore, if this variable was taken as the sole measure of growth, businesses in this cluster would seem to be growing!

Such a conclusion may be criticised as it is based upon an exploratory taxonomy. In part, this is justifiable and in future research it is the intention to develop more inclusive models (taking account of industrial sector, geographic location, etc.) of business performance. For the present, though, it would seem that the development of an appropriate taxonomic structure offers considerable potential for exploring small businesses and growth.

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