

How Good are Small Firms at Predicting Employment?

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ABSTRACT. This paper utilises some data from an interview survey of very small firms in the North of England to examine the relationship between actual and forecast employment in small firms over a twelve month period. The paper first provides some summary statistics on actual and forecast employment for the survey firms over the reference period. It then looks at how successful the firms are in their short term forecasts, and finds that there is systematic over-estimation. The causes of the systematic forecast error are investigated. It is suggested, tentatively, that the firms may in some way be incorrectly interpreting the information embodied in their own employment figures when making their forecasts. The paper concludes with a brief review of the results and possible policy implications. Avenues for future work are also proposed.

I. Introduction

In recent years much has been written about employment in small firms. (For a good overview, see Storey, 1994, ch. 6). Studies have examined a wide variety of issues, such as the relative contribution of such firms to net employment change, using a job accounting approach (e.g. Daly et al., 1991), and the *nature* of their employment, including the remuneration employees receive (e.g. Brown et al., 1990, ch. 4; Curran et al., 1993, ch. 8; Morissette, 1993; Reilly, 1995); the breakdown between full and part-time work (Storey and Johnson, 1987, p. 184; Scott et al., 1989, ch. 5; Curran et al., 1993, p. 10f); the extent of fringe wage benefits (e.g. Brown et al., 1990, ch. 5); and the employment profile of small firms since birth (e.g. Johnson, 1986, p. 86). Despite this extensive

interest in employment in small firms, little work appears to have been done on the expectations of these firms about future employment, and on how accurate their estimates are.¹

This paper offers a contribution to the literature by examining the relationship between small firms' short term employment forecasts – over six and twelve months – made in interview surveys, and their subsequent employment record. It thus provides some indication of the extent to which small firms tend to over-estimate or under-estimate their future employment prospects. Such knowledge is likely to be important for public policy, not least in the devising of appropriate training and advisory services aimed at helping firms to evaluate their prospects in a realistic way. It is also likely to be of value in the evaluation, by both private and public sector agencies, of business plans drawn up by small firms – for example, in applications for bank loans – and of the results of more general surveys of small firm prospects, such as those carried out by the Confederation of British Industry, and other similar bodies.

The plan of the paper is as follows. In section II the sample of firms used in the study is described. Section III outlines the way in which information on actual and forecast employment was collected, and presents some summary data on both. Section IV briefly examines some sources of forecast error. In section V, the divergence between actual and forecast employment is further explored. The final section reviews the work and suggests ways in which further research might be developed.

Unless otherwise stated, employment is measured on a full-time equivalent (FTE) basis. A part-time worker, defined here as someone working less than 30 hours a week, is counted as 0.5 FTE.

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II. The survey

This study is based on a survey of 121 firms which met the following conditions:

- i. They were all registered for VAT in March/April 1993
- ii. They were all located in the Northern Region² in the U.K.
- iii. They all remained in business in the region throughout the survey period
- iv. They maintained their co-operation throughout the survey period

The common VAT registration period was utilised in order to provide standardisation in the economic environment faced by the firms in the early part of their lives. The firms were identified via VAT records held by Customs and Excise. The limitations of these records, particularly with respect to their ability to identify very small firms are well known (Daly, 1990; Storey, 1994, pp. 50–51; Johnson and Conway, 1997). However they provide comprehensive coverage within their own terms of reference, and for the purpose of this study, are the best available, given the constraints on research resources.

For legal reasons Customs and Excise are unable to divulge the names and addresses of VAT registrants. However they did agree to send out a letter from the authors asking registrants to contact the authors direct. A stamped addressed envelope and response form was enclosed for this purpose. There are no obvious grounds for supposing that self-selection by co-operating respondents has generated any bias in relation to the characteristics of either the firms or the respondents involved. Each respondent was either the sole owner of his firm, or had a significant ownership stake in it. The broad industrial breakdown of the sample is not significantly different from that of the business population as a whole (see section III below).

The response rate that the 121 firms represent may be variously calculated (see Appendix). However, a realistic estimate would be 16 per cent. This compares favourably with the response rates of 13 and 7 per cent from postal surveys of rural and urban small firms respectively, reported in Keeble et al., 1992, and with the 10 per cent response rate – again in a postal survey of small firms – reported in Mason and Harrison (1993).

The exclusion of non-survivors in this study may be justified on at least two grounds. Firstly, one of the questions we wished to address was whether firms experienced any learning over the reference period. To achieve this, it was necessary to focus exclusively on survivors. Secondly, the recording of zero out-turn employment for all non-survivors would have ignored any variation that may exist in the severity of business failure.³

As shown later, most of the firms were in the services sector. Eighty-four per cent employed five or fewer FTEs at the start of the survey. Nearly 73 per cent were unincorporated, and 64 per cent of respondents described their main market as 'local' or 'regional'. On average, respondents had been operating in their current firm for 1.4 years by the start of the survey, although where they had taken over a firm (26 per cent of cases), the age of the firm was sometimes significantly greater.

III. Data collection and some summary statistics

Data collection

Respondents were interviewed three times: in the winter of 1993/94, the summer of 1994, and the winter of 1994/95. The first and last of these interviews were face to face, the middle one was undertaken by telephone. The second and third interviews were conducted six and twelve months respectively after the first interview.

In all three interviews, respondents were asked about their current position, the recent past, and how they saw their prospects for the future. In addition, the first interview was used to collect data on a range of respondent, firm and environmental characteristics. In all three interviews, respondents were asked for their current part- and full-time employment so that FTEs could be calculated. They were also asked to provide forecasts of their 'most likely' employment in the future.⁴

The employment forecasts relevant for this paper are as follows. In the first interview, respondents provided forecasts for six and twelve months ahead. In the second interview, they were asked about employment six and eighteen months ahead. It is possible therefore to compare forecast and out-turn employment for dates six and twelve months after the first interview, and for a date

six months after the second interview. It is also possible, by comparing the six month forecast made at the time of the first interview with the six month forecast made at the second interview, to examine whether FTE employment forecasts for six months ahead are changing and if so, whether they are becoming more or less accurate over time.

The employment forecasts are of course informal, in the sense that they do not derive from a structured business plan, but as Risseuw and Masurel (1994) have pointed out in their empirical study of planning in small firms, there is not much need anyway for very small businesses to have a written business plan. Informal forecasts are nevertheless important as they provide an indication of how the owner perceives future development.

Some summary statistics

Nearly three-quarters of the firms are in services (Wholesaling, Retailing/Dealing, and Other Services). Another fifteen per cent are in Manufacturing. This breakdown is not significantly different from that for all VAT registrations in the North and in the U.K. as a whole.⁵ The headcount and FTE methods of calculating employment yield similar distributions of employment across sectors. These employment distributions broadly reflect the sectoral spread in the numbers of firms.

Table I gives the mean and standard deviations for actual and forecast FTEs (actual is in bold). Not surprisingly given the relative youth of the firms involved, there was some employment growth over the year, although mean FTEs flattened out in the second six months. While it is true

that mean forecasts in all cases exceeded mean out-turns, the large spread in the data implies that we cannot conclude from Table I alone that the firms are optimistic forecasters. The standard deviations of the forecasts were greater than those of the out-turns, although in no case was the difference (in variances) found to be significant, using the standard *F* test.⁶

Table II provides some data on the proportionate forecast error. The table distinguishes between firms on the basis of whether their forecasts turned out to be correct, under-estimates, or over-estimates. It can be seen that those respondents who made over-estimates tended on average to make a bigger error than those who made under-estimates. Those respondents who made accurate forecasts mostly consisted of firms whose employment was static (see notes 2–4 to the table). It should also be noted that taking all the firms together, the longer term forecasts tend on average to be less accurate than the shorter term ones. There is no clear evidence of widespread learning between the two successive sub-periods.⁷

The large standard deviations recorded in Table II imply that in all three periods, the average forecast errors is not significantly different from zero, suggesting that it is not possible to reject the hypothesis that on average, the survey firms are on target. Clearly it is necessary to go beyond the kind of descriptive table so far presented, if further progress is to be made in analysing the relationship between out-turn and forecast employment. The issue is therefore further explored in the section V.

TABLE I
Actual and forecast employment

	Mean	SD	N
Actual employment, winter 1993/94	3.09	2.94	121
Actual employment, summer 1994	3.47	3.36	121
Forecast of employment, summer 1994, made 6 months earlier	3.80	3.51	121
Actual employment, winter 1993/94	3.46	3.24	121
Forecast of employment, winter 1993/94, made 12 months earlier	4.17	3.83	120 ¹
Forecast of employment, winter 1993/94, made 6 months earlier	3.88	3.68	120 ¹

¹ One respondent declined to provide this forecast.

TABLE II
Proportionate forecast error¹

Time period	Mean	SD	Number of firms
<i>Winter 1993/94 to summer 1994</i>			
Firms with negative error	-0.25	0.16	24
Firms with no error			53 ²
Firms with positive error	0.68	0.75	44
All firms	0.20	0.60	121
All firms, ignoring sign of error	0.30	0.55	121
<i>Winter 1993/94 to winter 1994/95</i>			
Firms with negative error	-0.26	0.17	25
Firms with no error			37 ³
Firms with positive error	0.93	1.18	58
All firms	0.40	0.98	120
All firms, ignoring sign of error	0.50	0.93	120
<i>Summer 1994 to winter 1994/95</i>			
Firms with negative error	-0.27	0.12	25
Firms with no error			50 ⁴
Firms with positive error	0.59	0.47	45
All firms	0.17	0.45	120
All firms, ignoring sign of error	0.28	0.39	120

¹ Defined as the difference between the forecast of employment for the end of the period, and the actual employment at the end of the period, expressed as a proportion of the actual employment at the end of the period.

² 40 of these businesses did not change their employment over the period.

³ 25 of these businesses did not change their employment over the period.

⁴ 33 of these businesses did not change their employment over the period.

IV. Possible sources of forecast error

Before the econometric relationship between forecasts and out-turns is considered, it may be helpful briefly to consider some possible sources of forecast error. The following are likely to be among the most important sources.

Interview bias

Such bias may arise where respondents wish to impress the interviewer, or believe that they have something to gain from providing a particular response. The possibility of such bias was reduced in this study by the interviewer stressing that (s)he had no interest in any particular outcome, and that

the individual results would not be disclosed to a third party. It should also be noted that respondents knew, at the time of each forecast, that there would be a follow-up interview, when forecasts would be set against out-turns.

Over-optimism bias

Madsen (1994) has argued that firms are often committed to higher production (which usually implies higher employment), and that they then search for information which provides support for their preferred outcome. In this way, expectations are likely to be biased upwards. Madsen argues, with some empirical support, that such over-optimism is likely to be an increasing function of uncertainty. The level of uncertainty in a market is likely to be positively related to the level of innovativeness, the intensity of competition, and the extent of market turbulence. Furthermore, the level of uncertainty is likely to be higher where the business is more dependent on a limited number of customers and suppliers, since even a single decision by a customer or a supplier may have a major effect on the business. In addition, a growing market may stimulate more uncertainty than a static one. Business motivation will also play a role, with more ambitious respondents more likely to generate over-optimism bias.

An incomplete or inaccurate information set

Future employment will be affected by a range of factors, including the present state of the respondent's business and its capacity to grow; the current and future behaviour of competitors; market prospects; and general economic conditions. The availability of good information in each of these areas will tend to be positively related to the degree to which the owner and any staff have accumulated knowledge and experience. The size of the business may itself embody information on past performance and on the location of the firm on its expansion path.

The information set available to the owner at the time he makes the forecast inevitably excludes information on events that occur after that time, but which could not be accurately foreseen. A forecast error may result from such unanticipated events, even though the information set at the time

of the forecast may have been otherwise complete, and been interpreted correctly. However, we are not aware of any unexpected shocks that occurred during any of the forecast periods (see also note 7).

Poor interpretation of information

How well the information that is available is interpreted will influence the forecast error. Owners are likely to vary in the time and effort that they put into evaluating information, and in the skill they have in doing so. One factor influencing the inputs into forecasts will be the consequences that flow from it. A request for a forecast at an interview inevitably restricts these inputs, although it should be noted that in this study the forecasts were only made after some discussion of the business and its plans, and the environment in which it operates.

V. The divergence between actual and forecast employment: statistical analysis

The notation in this section is as follows. E_t is FTE employment at time t . F_tE_{t+1} is the forecast, at time t , of FTE employment at $t+1$, where i is the number of time periods after the date at which the forecast is made. At winter 1993/94, $t = 0$; at summer 1994, $t = 1$; and at winter 1994/95, $t = 2$. Thus one time period covers a six month period. Using this notation F_0F_2 , for example, is the FTE forecast for twelve months ahead made at the time of the first interview, ie during the winter 1993/94.

As a starting point for our analysis, actual employment was regressed on forecast weighted employment, for the three available periods, for

the 119 firms who provided a complete set of data, that is,

$$E_{t+i} = \alpha + \beta F_tE_{t+i} + u_{t+i}$$

where the notation is as before and where u_{t+i} is the usual white noise random error term. The results are given in Table III. They demonstrate that even over a period as short as six months, there is evidence of systematic over-estimation: the coefficient on forecast employment in all three periods is significantly less than unity.⁸ Whilst the intercept is not significantly different from zero by a standard t test, the hypothesis of unbiasedness (column 6) is clearly rejected. Furthermore the evidence of heteroscedasticity in the equation (column 7) also violates the clear requirement for a 'good' prediction that there should be white noise error.⁹ There is little evidence of a sectoral or time period component to these results.¹⁰ Nor do the results appear to be affected by measurement error.¹¹

The next stage was to consider the determinants of the forecast error (measured here by $E_{t+1} - F_tE_{t+1}$). On the basis of the discussion in section IV, the effects of a range of respondent, business and environmental characteristics on the error were first examined, using multiple regression.¹² Given the small size of the error, and the short time periods covered, it was not surprising to find that for most of the characteristics considered, it was not possible to detect a systematic influence. They are not therefore discussed further here. However, as can be seen from Table IV, it was possible to identify some factors which have a systematic effect on the errors. These factors are: employment in the business at the time of the forecast (E_t); the length of time the firm has been

TABLE III
Regressions of actual on forecast employment

(1) Dependent variable	(2) Independent variable	(3) α	(4) β	(5) R^2	(6) F*	(7) BP(1)
E_1	F_0E_1	0.24 (0.21)	0.85 (0.04)	0.79	9.50	42.00
E_2	F_0E_2	0.49 (0.23)	0.72 (0.04)	0.72	32.48	18.04
E_2	F_1E_2	0.49 (0.21)	0.77 (0.04)	0.76	20.70	7.94

F* is the test of unbiasedness, i.e. no intercept and unity slope parameter, with 2 degrees of freedom in the numerator, 117 degrees of freedom in the denominator. The critical value is 3.07 at 5% significance.

BP(1) is the Breusch-Pagan Test of Heteroscedasticity based on the regression of the squared residuals on the squared fitted values, with one degree of freedom.

TABLE IV
The divergence between actual and forecast employment: some results

Dependent variables	Equation (1) $E_1 - F_0E_1$	Equation (2) $E_2 - F_0E_2$	Equation (3) $E_2 - F_1E_2$	Equation (4) $E_2 - F_1E_2$
<i>Independent variables</i>				
INTERCEPT	-0.26 (0.22)	-0.23 (0.27)	0.16 (0.25)	0.11 (0.25)
$\ln E_f$	-0.42 (0.22)**	-1.00 (0.27)*	-0.69 (0.23)*	-0.56 (0.21)*
$\Delta \ln E_f$				-1.03 (0.47)*
MKTGRWTH				0.05 (0.03)**
BUSAGE	0.18 (0.09)*	0.26 (0.10)*	0.04 (0.09)	
R^2	0.05	0.11	0.08	0.10
F	3.31*	7.16*	5.05*	4.32*
RR(1)	3.27	1.56	4.22	2.66
BP(1)	0.07	0.24	0.19	0.93

RR is the Ramsey-RESET test of functional form; * indicates significant at 5%; ** indicates significant at 10%.

in business (BUSAGE); and the growth of the market (MKTGRWTH), measured here as the proportionate change in employment between 1992 and 1993.

The “best” specification – Equation (4) in Table IV – includes not only the log of employment ($\ln E_f$) but also its proportionate rate of change over the preceding period ($\Delta \ln E_f$), a variable which is of course only available for the second six month period, and which is not therefore incorporated into Equations (1) and (2) in Table IV, which relate to the first six months period. Equation (3) provides a direct comparison for the second six month period with the results presented in Equations (1) and (2).

One plausible, though tentative, interpretation of the results is that respondents may in some way be incorrectly interpreting the information embodied in their own employment figures, including the rate of employment change. For example, if a respondent believes that the expansion path he is on is linear, when it is in fact logarithmic,¹³ then he will make systematic errors. Prediction over short periods will appear superficially good, due to the approximation of the logarithmic to the linear path, but it will deteriorate over a longer period. If this interpretation is correct, it will have important implications for long term planning, which may sometimes involve substantial capital investment, by small businesses. This point is highlighted by the smaller β coefficient (in absolute terms) on the employment term in the second equation in Table III, sug-

gesting that the effects of misinterpreting the signals from current employment are exacerbated over time.

There is some limited evidence from Equation (4) in Table IV that market growth (MKTGRWTH) – which does of course partially capture an industry effect – may temper any error generated by the firm’s misperception of the data on its own employment. The systematic, rather than random, effect of market growth on forecast error suggests that firms may not be predicting developments in their own markets well enough and this in turn may have consequences for the accuracy of their employment forecasts.

There is also some suggestion from the positive sign on BUSAGE in Equations (1) and (2) in Table IV that misinterpretation of the employment data may be mitigated by the length of time the firm has been in business. One explanation for this finding may be that firms which are further along their expansion path are more likely to have approached the limits of their expansion, and thus be at a fairly static and predictable employment level. It may also be the case, that as the business grows older, the collective wisdom it embodies increases and enables a truer assessment to be made.

It is important to note that there is no significant intercept in any of the four equations. The absence of such an intercept is consistent with there being no unexpected shocks affecting all the sample firms identically during the forecast period.

VI. Discussion and conclusions

This paper has provided a preliminary examination of the relationship between forecast and out-turn employment for a sample of very small firms over a short time horizon. Our tentative finding is that very small firms tend to systematically over-estimate their prospects. We have no grounds for supposing that the results are caused by unexpected shocks during the forecast periods.¹⁴ Table II shows that on average the two six month forecasts exceed the out-turn by between 17 and 20 per cent, and by about 40 per cent for the twelve month period. The larger average error for the longer period is not surprising given the greater uncertainty associated with this period. Any interpretation of these data must bear in mind the methods used to obtain the forecast, and in particular, the absence of any penalties for wrong forecasts. It is difficult however to envisage any practical situation in which *all* possibilities for bias are absent. And, as indicated in section IV, every effort was made in this study to reduce any distortion that might arise as a result of the survey method used.

The conclusion of this paper that small firms tend to over-estimate future employment is consistent with the very high failure rate¹⁵ among small young firms. Ganguly (1985, p. 140) for example has shown that over 50 per cent of firms registering for VAT in the U.K. have deregistered by the sixth year. Data on U.K. company registrations HMSO (1994) indicate that only 40 per cent of those incorporated in 1988 were still active in March 1994. It is possible that some of the owners of these firms may have *planned* to leave business within six years. It is however more likely that most started out with longer term intentions, i.e. they over-estimated their prospects.

Further support for this view comes from data collected in the study on the twenty-one respondents who left business in the year between the first and last interviews, but who are not included in this analysis. In the first interview, only two of these respondents forecast that their 'most likely' employment level in twelve months time would be zero. When the 'failed' respondents were asked in the first interview to predict the likelihood of their being in business in twelve months time on a five point scale – from 0 ('will definitely not be

in business') to 4 ('will definitely be in business') – sixteen gave scores of 3 or 4.

Our results suggest that one plausible reason for the over-estimation of future prospects is that firms may not be correctly interpreting the information embodied in data on their own employment record when they make their forecasts, although greater business age and (windfall) market growth may temper the inaccuracy of the estimates. If this interpretation of the results is correct, then one policy option might be to stimulate a greater awareness (and realism), on the part of those involved in very small firms, of business development patterns. Such a policy would however involve public funding. It would thus be necessary to argue that the social net returns from an initiative of this kind are positive. This may not be the case: it may be socially more efficient to let businesses find out their mistakes from experience, notwithstanding the high personal costs that are often involved.

We would be the first to acknowledge the very tentative nature of our results and the interpretation we have given to them. Clearly further work is required. At least two avenues of future research may be suggested. Firstly, it would be useful to explore precisely how forecasts are formed.¹⁶ For example, do very small firms use any rules of thumb in making judgements about the future? Secondly, it would be helpful to examine any learning in forecasting that takes place over time. We hope to continue monitoring the forecasting performance of the present sample. This monitoring should be able to identify and explain changes over time.

Appendix on response rate

The Customs and Excise letter was mailed to 1014 individuals who registered for VAT in March/April 1993 at their offices in Carlisle, Middlesbrough, Newcastle and Washington. Registrations resulting from a change of name or business reorganisation were excluded from this mailing. In total 305 responses were obtained. Of these, 47 (15.4%) were ineligible, either because they were not independent private sector firms, or because they were not located in the Northern Region. (The geographical coverage of the VAT offices identified above sometimes extend outside the Region.) A

further 89 (29.2%) respondents replied but refused to cooperate, leaving 169 willing to participate. Of this 169, 24 (7.9% of the original 305) left business after the initial mailing. A further 24 were excluded from consideration in this paper because although they remained in business, they did not participate throughout the survey period. The reasons for this non-participation varied and included illness, migration from the region, and a withdrawal of co-operation, usually because of other commitments.

If it is assumed that the ineligibility rate (15.4%) is applicable to the *whole* sample of 1014, the number of firms who might in principle have been eligible to participate was 858. If it is then assumed that the “death rate” applicable to the 169 (14.2%) applies to this 858, then the total number of respondents eligible to participate and not ruled out on the grounds that they died during the survey period was 736. The response rate in the text is obtained by expressing the number of actual participants as a percentage of this figure of 736. The assumptions in this calculation are not subject to direct test. However the *a priori* arguments for and against their validity are fairly evenly balanced.

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Notes

¹ Hakim (1989) however briefly discusses the issue. She refers to (but does not present) the results of a quarterly survey of small businesses conducted by the Small Business Research Trust, to argue that ‘plans tend to be realistic and closely

parallel actual growth’. It should be noted however that the methodology used in the survey and the size distribution of the survey firms are not comparable with those presented in this paper.

² Defined here as the areas covered by the Carlisle, Middlesbrough, Newcastle and Washington VAT offices.

³ When the non-survivors who did not predict their own departure from business are included, all the regressions in Table IV continue to show systematic bias, with the estimates of β lower than those reported in the table, but with no discernible change in the standard errors. The predictive failure test shows that there is a significant difference between survivors and non-survivors. The relevant results are available from the authors.

⁴ More complex questions – involving, for example, a probability distribution of possible future employment outcomes – were considered, but rejected on the grounds that respondents might have difficulty in giving meaningful responses. It should also be noted that forecasts relating to other aspects of business, e.g. turnover, and to other time periods, were also provided by respondents, but these are not considered in this paper.

⁵ Using data from DTI (1993), chi-squared tests for homogeneity of the distribution of firms between different sectors in the North and the sample, and the U.K. and the sample, were run. In neither case was the distribution significantly different at the 5 per cent. Details are available from the authors.

⁶ It has been suggested (see Lovell, 1986) that the influence of events unforeseen at the time of the forecast would ensure greater variation in out-turn employment than in forecast employment. The data in Table I do not show such greater variation.

⁷ We compared the proportionate error, ignoring the sign, in the two periods for each firm. 39 per cent showed some improvement, and 31 per cent a deterioration. The rest of the sample showed neither an improvement nor a deterioration.

⁸ Even if a White adjustment for heteroscedasticity is made, the coefficient is still significantly less than one. (Technically of course the appropriate test of unbiasedness is that reported in column 6 of Table III *together with* the presence of white noise error.)

⁹ The tests used here for unbiasedness and non systematic errors are directly analogous to those used for rational expectations in the macroeconomics literature. For a good survey, see Holden et al. (1985) and Sheffrin (1983).

¹⁰ The classification of very small firms of the kind covered in this study into separate sectors is somewhat problematic. However, when the sample was subdivided into the three broad categories of distribution, other services and production, and each of these sectors was examined separately for each of the three time periods, we found that in seven of the nine cases the null hypothesis was rejected at the one per cent level. Joint significance tests across the three sectors, and across the three time periods for each sector, indicate that the null hypothesis was rejected at a significance level of less than one thousandth of one per cent.

¹¹ To test for the presence of such error, we followed Beach et al. (1995) using the procedure proposed by Wald (1940) and Bartlett (1949). The results from the grouping exercises

reinforce those presented in Table IV where unbiasedness is clearly rejected. Full results are available from the authors.

¹² These characteristics, measures of which were all obtained from the interview survey, are as follows. *Respondent characteristics*: age; education; motivation; own and family's experience in business; period in business; perceived prospects of survival; and previous employment. *Business characteristics*: age; employment; employment of professionals/managers in labour force; importance of larger customers; innovativeness; level of competition; geographical nature of the markets served; method of contacting largest customer; and sources of supply. *Environmental variables*: market growth; and market turbulence. Full details of the way in which these variables are measured and regression results are available from the authors.

¹³ There is some limited evidence for this: see for example the profile depicted in Johnson (1986, p. 86).

¹⁴ In the light of our findings, it is interesting to note the results of the study by Beach et al. (1995) on price expectations by vegetable growers in the U.S. These authors found that such growers typically over-estimated future prices for their produce. They also argued that such over-estimation was not due to unexpected shocks in the forecast period.

¹⁵ The term 'failure' is used here as a catch-all phrase covering all forms of movement out of business. Not all such movement implies that the business involved was financially unsuccessful. However, as the text suggests, withdrawal from business activity in the early stages is often not intended, and in this sense can be regarded as an expression of failure.

¹⁶ Some results of a preliminary exploration of this issue are available from the authors.

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