

**ENTREPRENEURIAL ORIENTATION AND ENTREPRENEURS'  
INTENTIONS AND OBJECTIVES**

ESRC Centre for Business Research, University of Cambridge  
Working Paper No. 271

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September 2003

This Working Paper forms part of CBR Research Programme 3  
on Small and Medium-sized Enterprises.

## **Abstract**

Entrepreneurship has become an important issue for policy. At one level, enterprise creation is recognised as important for employment growth and effecting structural change; at another, there is concern to encourage existing firms to become more entrepreneurial as a means of enhancing international competitiveness. Entrepreneurial orientation (EO) reflected in recurring organisational behaviour such as innovativeness, pro-activeness and risk-taking is important in the latter context. This paper explores the extent to which differences in motives, intentions and personal objectives held by entrepreneurs were reflected in organisational behaviour relating to the dimensions of EO suggested by Lumpkin and Dess.

The paper reports on a group of 153 high-tech CEOs first surveyed in 1998 when information was sought about their family and educational background, antecedents to setting up in business, motivations for doing so and personal objectives. The same CEOs were subsequently surveyed early in 2001. This second study examined ownership structures, perception of competitive issues, market characteristics, innovative behaviour, attitudes towards HRM policies, personal objectives, approaches towards risk and recent performance.

**JEL Codes:** L21, L25, M13

**Keywords:** entrepreneurship, entrepreneurial orientation, high technology small firms

## **Acknowledgements**

All studies of this nature are only possible with the support and co-operation of those who take part. Our special thanks are to those who gave their time to participate. A version of this paper was presented at the 11<sup>th</sup> High Tech Small Firms conference, Manchester, June 2003.

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## 1. Introduction

Recognition of the economic significance of small firms, and high-tech small firms in particular grew during the last quarter of the 20<sup>th</sup> century (Loveman, and Sengenberger 1991, Acs and Audretsch, 1993). In the UK several strands of policy have coalesced into a general focus on ‘competitiveness’ (Wren, 2001; DTI, 2001). At the same time organisation theory has come to view entrepreneurship as a firm level phenomenon. In particular increasing attention has been paid to ‘entrepreneurial orientation’ seen as process reflected in recurring organisational behaviour (Covin and Slevin 1991) rather than the actions of individuals possessing certain attributes or characteristics. Behaviour important in both policy and organisational theory contexts includes willingness to take risk, innovativeness, technological leadership and a proactive stance toward competition (Khandwalla, 1977; Covin and Slevin, 1991; Lumpkins and Dess, 1996; DTI, 2001).

In small high technology firms, organisational outcomes however are likely to be profoundly influenced by founders (Hannan *et. al.* 1996). What characteristics or attributes of individual entrepreneurs influence the types of organisational behaviours outlined above? Situational variables such as employment status and individual variables such as personality traits, and demographic characteristics have been found to be relatively poor predictors of even survival and success, let alone of specific organisational behaviour such as innovativeness (Cooper and Gascon, 1992).

Drawing upon work in social psychology, entrepreneurship has been studied as intentional, planned behaviour by individuals (Bagozzi, et al. 1989; Ajzen, 1991, Krueger *et. al.* 2000). However one area which has not been widely studied is the extent to which the more general objectives and intentions held by entrepreneurs shape specific organisational actions and behaviour.

The aim of this paper is to examine the innovativeness, pro-activeness and openness to risk displayed by a group of small high technology firms and to try to assess the extent to which such behaviour was related to the objectives held by their CEOs. The paper draws upon two surveys of high-tech entrepreneurs conducted in the UK: the first in 1998 and the second in 2001. The former examined information about family and educational background, and antecedents to and motivations for doing setting up in business. The same CEOs were included

in a second survey that addressed ownership structures, market characteristics, innovative behaviour, personal objectives, and recent performance.

The paper begins by outlining the main characteristics of the CEOs and their businesses, and the recent performance of these firms. A discussion of the indicators of entrepreneurial orientation used follows. The final sections examine the extent to which displayed entrepreneurial orientation was found to be related to recent performance and three types of objectives expressed by the CEOs: motivations for and intentions when setting up in business, personal objectives for the business and growth objectives.

## 2. The study

Over 500 businesses in high-tech sectors,<sup>1</sup> located in various parts of the UK, responded to the first survey in 1998 (29% response rate). Of these, 153 responded to the second survey. In 133 cases (87%) the same individual responded to both surveys but in 20 cases it was clear that the person responding in 2001 was not the same person who had responded in 1998. The criteria adopted was that the person responding in 2001 should be familiar with the objectives held by the 1998 respondent and that the 1998 respondent was likely to play an active role in the company in 2001. The effective number of businesses considered was 142.

Table 1. *Types of Respondent*

Same person	Frequency	Percent
Yes	133	86.9
No: other founder	3	2.0
No: family member	6	3.9
No: promoted non family	5	3.3
No: recruited non family	2	1.3
No: MBO/MBI	4	2.6
Total	153	100.0
Effective total	142	

## 2.a Background characteristics of the CEOs and their businesses

Table 2. *Characteristics of CEOs*

<b>Age groups in years</b>	<b>Frequency</b>	<b>Percent</b>
<40	9	6.4
>=40 <50	36	25.7
>=50 <60	63	45.0
>=60	32	22.9
<b>Total</b>	<b>140</b>	<b>100.0</b>
<b>Gender</b>		
Male	129	90.8
Female	13	9.2
<b>Ownership group</b>		
No current ownership	7	5.1
Sole props and proxy sole props	38	27.9
Internally shared (no external ownership)	48	35.3
External and internally shared	43	31.6
<b>Total</b>	<b>136</b>	<b>100.0</b>

**The CEOs:** CEOs taking part in both surveys were predominantly male with an average age in 2001 of 53. Two thirds of the businesses were collaborative ventures involving more than one owner/founder. These were evenly divided between those in which ownership was shared wholly internally and those in which some ownership was held externally.<sup>2</sup>

Table 3. *Characteristics of the Businesses*

<b>Activity</b>	<b>Frequency</b>	<b>Percent</b>
<b>Manufacturing</b>	<b>95</b>	<b>66.9</b>
Instruments	52	36.6
Computers, electrical and electronics	18	12.7
Other manufacturing	25	17.5
<b>Services</b>	<b>47</b>	<b>33.1</b>
Computer activities and telecommunications	20	14.1
R&D & technical testing	27	19.0
Total	142	100.0
<b>Date of founding</b>		
Since 1990	26	18.3
1989 -1980	52	36.6
Before 1980	64	45.1
Total	142	100.0
<b>Turnover size group</b>		
> £1 million	44	35.2
>= £1m <£5m	61	48.8
>=£5m	20	16.0
Total	125	100.0
<b>Employment size group</b>		
<20 employees	45	32.6
>=20 <50 employees	62	44.9
>=50 employees	31	22.5
Total	138	100.0

**The Firms:** Two thirds of the firms were in manufacturing with instrument manufactures accounting for more than half of these. Service sector firms were roughly evenly divided between those engaged in telecommunications and computer software<sup>3</sup> (CST) and technical testing and R&D firms (RDT). Three quarters of the firms had been founded before 1990, over 80% had turnover of less than £5 million in 2001 and almost 80% employed fewer than 50 people. Median firm age was 18.5 years, median turnover size £1.6 million and median employment size was 27 employees. There were significant differences between firms in different sectors: manufacturing firms tended to be older and larger, in terms of employment, but RDT firms were smaller in terms of revenue<sup>4</sup>.

## 2.b Recent Performance

Respondents were asked to give the percentage change in real turnover and employment, and average pre-tax profits recorded during the two years prior to the 2001 survey. Just over half of the firms recorded growth in turnover in the period and just under half recorded growth in employment. Median turnover growth

during the 2 years prior to the study was 20% and the comparable figure for employment was 15%<sup>5</sup>. Over 40% of the firms recorded average pre-tax profits of more than 10%; median profit rate was 9.2%. Eleven firms recorded losses.

To differentiate firms on the basis of performance account was taken of size and sector. Accordingly firms were allocated to relative performance groups in respect of turnover and employment growth within size bands<sup>6</sup>. Size was not important in respect of profits but sector was. Significant differences were found in average levels of profitability between manufacturing and service sector firms. (Average pre-tax profits in manufacturing were 10.7% compared to 27.5% and 30.5% respectively for firms in the two service sectors). Relative performance of profits was judged in relation to sector.

Table 4. *Performance 1999-2001*

<b>Turnover growth (real)</b>	<b>Frequency</b>	<b>Percent</b>
Decreased	31	22.8
Unchanged	30	22.1
Increased	75	55.1
Total	134	100.0
<b>Employment growth</b>		
Decreased	25	19.1
Unchanged	47	35.9
Increased	59	45.0
Total	131	100.0
<b>Average Pre-tax profits</b>		
Loss/negligible (<2%)	19	17.1
2- 5%	16	14.4
>5%- 10% or less	29	26.1
>10%	47	42.3
Total	111	100.0

### **3. Entrepreneurial orientation (EO)**

Although later extended by Lumpkin and Dess (1996) the dimensions of entrepreneurial orientation with which this paper is concerned are innovativeness, pro-activeness and openness towards risk (Miller, 1983; Covin and Slevin, 1986,1989). Lumpkin and Dess suggest that EO represents key entrepreneurial processes and is concerned with **how** new ventures are undertaken, whereas entrepreneurship refers to the content of decisions taken: what is undertaken. Most empirical studies of entrepreneurial orientation have utilized the instrument developed by Miller (1983) and extended by Covin and Slevin (1986; 1988; 1989).

This instrument has been criticized on the grounds of mixing perceptual or subjective evaluations, such as current attitudes held by CEOs, with self-reporting of more objective information relating to past organisational behaviour (Brown *et al.* 2001). The approach adopted in this paper was to focus primarily on reported organisational behaviour as a demonstration of EO and second to set the subjective intentions and objectives held by the CEOs in relation to the levels of EO demonstrated.

### **3.a Pro-activeness**

Pro-activeness is concerned with ‘first mover’ and other actions aimed at seeking to secure and protect market share and with a forward-looking perspective reflected in actions taken in anticipation of future demand (Miller, 1983; Covin and Slevin, 1989; Lumpkin and Dess, 2001). The indicators of pro-activeness used here comprised collaboration; incidence and extent, innovations, (in particular the incidence of ‘novel’ innovations); activities designed to protect intellectual property and market structure.

**Collaboration:** Information was sought about formal or informal collaboration or alliances with other organisations during the two years prior to the 2001 study and the purpose of collaboration. Over half of the firms reporting collaboration had relationships with at least one of the following: ‘*firms in the same line of business*’ ‘*customers*’ and ‘*suppliers*’. The majority (more than two thirds) reporting collaborative partnerships gave more than one purpose. However regardless of the type of organisation collaborated with, the purpose of collaboration was dominated by market-related issues. Of 74 CEOs giving reasons for collaboration 62 mentioned either ‘*to expand the range of products/services*’ and/or ‘*to provide access to new markets*’. Half of the remaining CEOs gave ‘*meeting current customer/client needs*’ as the purpose of collaboration. Given that market-related issues dominated reasons for collaboration, firms were assessed for pro-activeness in terms of the diversity of organisations with which they had collaborated.

**The Incidence of Innovation:** Pro-activeness is concerned with ‘first mover’ actions. The 2001 survey asked about innovation in product/service, logistics, and/or delivery and whether innovations constituted changes ‘new to both the firm and the industry’ or changes ‘new only to the firm’. The former were termed ‘novel innovation’ and can be seen to demonstrate pro-activeness.

**The level of IP activity:** Over 60% of firms undertook no activity concerned with protecting intellectual property in the two years prior to the 2001 survey. Among the minority of firms that were active there was a clear distinction between those applying for, or being granted such protection in relation to an individual development and those firms in which this was a more generalized activity and often combined with licensing.

**Market structure - Niche market effect:** In common with other studies of small businesses (Kitson and Wilkinson, 2000) the majority of firms (60%) could be classified as operating in 'niche markets': confronting 5 or fewer serious competitors. Although striving to establish dominance in a niche market may demonstrate pro-activeness, account also needs to be taken of the extent to which that market is dominated by one or two customers, on which the firm is highly dependent. Few firms (13%) were dependent on a single customer for more than 50% of turnover, however in more than a third the top 3 customers accounted for more than 50% of turnover.

It can be suggested that the ideal 'niche market' sought is where customer dependence is relatively low and serious rivals few. Such situations were considered to have a 'positive' niche market effect. The reverse situation: relatively high customer dependence combined with higher numbers of serious rivals was considered to have a 'negative' effect and intermediate situation a 'neutral' effect.

On the basis of the above indicators the firms were 'scored' in terms of their level of pro-activeness.

Table 5. *Pro-activeness indicators*

<b>Collaboration</b>	<b>Frequency</b>	<b>Percent</b>
No collaboration	63	45.0
Collaboration with only one type of organisation	29	20.7
Collaboration with more than one type of organisation	48	34.3
Total	140	100.0
<b>Innovation</b>		
Non innovator	26	18.6
Low level (non-novel)	39	27.9
High level (novel)	75	53.6
Total	140	100.0
<b>Level of IP activity</b>		
None undertaken	82	62.1
Less active	19	14.4
More active	31	23.5
Total	132	100.0
<b>Number of serious competitors</b>		
2 or fewer	36	26.7
3-5	45	33.3
More than 5	54	40.0
Total	135	100.0
<b>Dependence on top three customers</b>		
< 25% of turnover	48	35.0
>=25% <50% of turnover	40	29.2
>=50% of turnover	49	35.8
Total	137	100.0
<b>Niche market effect</b>		
Negative: high dependence/many rivals	46	34.1
Neutral: even dependence and rivals	53	39.3
Positive: low dependence/few rivals	36	26.7
Total	135	100.0

### 3.b Innovativeness

Innovativeness is concerned with supporting and encouraging new ideas, experimentation and creativity likely to result in new products, services or processes (Miller and Friesen, 1983). The indicators used to assess innovativeness comprised the level of involvement in R&D, the extent of innovation and qualifications of the workforce.

**Level of involvement in R&D:** Firms were asked to indicate their level of involvement in R&D. For a small number of firms (13) R&D was their primary activity. In total, almost 60% claimed to be highly involved in R&D, although quarter undertook no R&D.

**Extent of innovation:** The 2001 survey asked the nature of innovations as between product/service, process and logistics or delivery of service. Some firms recorded innovative activity across a broad spectrum whereas others recorded innovations only in respect of product or service. The diversity or extent of innovative activity was considered an important indicator of innovativeness.

Table 6. *Innovativeness indicators*

<b>Engaged in R&amp;D</b>	<b>Frequency</b>	<b>Percent</b>
Yes our primary activity	13	9.3
Yes continuously	68	48.6
Yes occasionally	24	17.1
No	35	25.0
Total	140	100.0
<b>Extent of innovation (score max 3)</b>		
No innovation	26	18.6
1	41	29.3
2	32	22.8
3	41	29.3
Total	140	100.0
<b>Full-time employees with degrees</b>		
None	29	21.4
<10%	33	24.4
>=10% <25%	22	16.3
>=25% <50%	21	15.6
>=50% <75%	15	11.1
>=75%	15	11.1
Total	135	100.0

**Qualifications of the Workforce:** Firms in the study operated in technology sectors. It has been argued that ‘individual intellectual capacity’ influences innovation in technology-based firms (Briggs and Keogh, 1999). In this context qualification of the workforce, and in particular the proportion qualified to degree level or above, was considered an important factor likely to influence innovativeness. In almost 40% of firms full-time employees qualified to first-degree level or above comprised more than 25% of the workforce. Again firms were compared on the basis of their employment size, since in many firms employing less than 20 employees with a degree accounted for more than 50% of the total workforce, such percentages were rare in firms employing more than 50.

As with pro-activeness the above indicators were used to ‘score’ the firms in terms of innovativeness.

### 3.c Risk-taking

Measuring the extent to which individuals differ in their willingness to take risk is contentious. Early work in small business research tended to be focused on various psychological characteristics such as locus of control (Rotter, 1966) and tolerance of ambiguity (Gasse, 1982). CEOs' subjective evaluation of their approach towards risk is also fraught with difficulty since what one person regards as a 'calculated' approach another may regard as 'aversion'. Others have suggested that the differentiating factor is the way risks are calculated (Norton and Moore, 2002). This study focused on behaviour which might indicate willingness to take risks, namely seeking venture capital, and two indicators of willingness to invest with uncertain returns: level of spending on R&D and investment in training as indicated by the level of off-job training for full-time employees.

**R&D Spending:** Just over half of the firms undertaking R&D spent an average of less than 10% of turnover on R&D in the 2 years prior to the 2001 study but a quarter recorded levels of more than 10% of turnover.

**Venture Capital:** Few firms (28) had sought venture capital and those that had were evenly divided in terms of success. Seeking venture funding was regarded as indicative of a willingness to take risks.

**Off-Job Training:** The impact of involvement in technology sectors was evident from the incidence and extent of training undertaken. Many studies of small firms suggest that they do not train (Voss *et. al*, 1998). However like other recent studies (Barnett and Storey, 2000) the incidence of training in the firms in this study was high. Almost two thirds provided some off-job training for full-time employees and in a quarter over 20% of full-time employees were given such training. As with employment growth and qualification of the workforce, relative training performance was assessed in respect of employment size.

Table 7. *Indicators of Risk Taking Behaviour*

<b>R&amp;D spending</b>	<b>Frequency</b>	<b>Percent</b>
No R&D undertaken	35	29.2
<10% of turnover	54	45.0
>=10% of turnover	31	25.8
Total	120	100.0
<b>Seeking Venture Capital</b>		
Not sought	110	79.7
Sought	28	20.3
Total	138	100.0
<b>Percentage of Full-Time Employees Given Off-Job Training</b>		
None	42	35.3
10% or less	22	18.5
>10% <=20%	26	21.8
>20%	29	24.4
Total	119	100.0

Indicators were combined to derive a risk-taking behaviour ‘score’, however in this case greater weight was given to seeking venture capital.

On the basis of the raw scores derived from the indicators outlined above the dimensions were positively related to each other. Innovativeness and pro-activeness were particularly strongly related and risk-taking was slightly more strongly related to innovativeness than pro-activeness.

Table 8. *Relationship between EO Dimension Scores*

<b>Spearman's rho (Using raw scores)</b>		<b>Risk</b>	<b>Pro-activeness</b>
Pro-activeness	Correlation Coefficient	.244	
	Sig. (2-tailed)	.005	
	N	130	
Innovativeness	Correlation Coefficient	.372	.497
	Sig. (2-tailed)	.000	.000
	N	135	136

#### **4. Entrepreneurial Orientation and Recent Performance**

For the purposes of analysis the firms were allocated to simple high : low dichotomous groups for each dimension on the basis of the median score. For pro-activeness and innovativeness this resulted in roughly equal sized groups but less so in the case of risk-taking. As conventionally measured EO is regarded as having a positive impact on firm performance however empirical tests of this

relationship and using a variety of performance measures have yielded inconsistent results (Covin and Slevin 1986; 1989; Zahra, 1991; Smart and Conant, 1994; Covin *et. al.*, 1994 and Zahra and Covin 1995). Furthermore studies of the impact on growth of innovation in small firms have pointed to ‘temporal asymmetry’ arising out of the lagged nature of the impact of innovation (Cosh, *et. al.* 1996). Hence given the extremely short time period no strong relationships were expected, nevertheless weak relationships did emerge.

Table 9. *EO Dimensions and Recent Performance*

	Pro-activeness		Innovativeness		Risk-taking	
	Low	High	Low	High	Low	High
	%	%	%	%	%	%
<b>Turnover Growth</b>			**	**		
No growth	48.5	40.6	55.2	34.8	41.1	50.9
Low growth	26.5	26.6	22.4	30.3	31.5	16.4
High growth	25.0	32.8	22.4	34.8	27.4	32.7
Total	68	64	67	66	73	55
<b>Employment Growth</b>	*	*	*	*		
No growth	59.4	49.2	60.3	49.3	54.2	54.5
Low growth	26.6	20.0	25.4	20.9	26.4	20.0
High growth	14.1	30.8	14.3	29.9	19.4	25.5
Total	64	65	63	67	72	55
<b>Profits</b>	**	**				
Loss/Insignificant	30.9	48.2	31.4	46.7	30.9	49.1
Low	32.7	28.6	33.3	28.3	36.4	24.5
High	36.4	23.2	35.3	25.0	32.7	26.4
Total	55	56	51	60	55	53

(\*\*p =<0.05 \* p=<0.1 )

Both pro-activeness and innovativeness were weakly positively related to employment growth and innovativeness was positively related to turnover growth. In particular over half of the firms judged to have shown relatively low levels of innovativeness had experienced no growth in turnover between 1999 and 2001 compared to about a third of their more innovative counterparts. A weak negative relationship emerged between pro-activeness and profits. About half of the firms judged to be highly pro-active made losses or recorded low pre-tax profits compared to 30% of less pro-active firms.

## 5. Personal Characteristics and Experiences of CEOs

Early research on entrepreneurship focused on the characteristics and experiences of individual entrepreneurs as determinants of survival and success. The 1998 survey focused on the antecedents to entrepreneurship including previous work experience, qualifications, family background, and first and subsequent experiences of entrepreneurship. Confirming the findings of others such factors appeared to have little impact on organisational behaviours associated with EO (Cooper and Gascon 1992). The only exceptions to this were the level of educational attainment of the CEO and whether the firm's founding team had included someone who had previously worked in the research base organisation. The latter experience was weakly positively related to innovative behaviour. Firms headed by CEOs with no tertiary educational qualifications were likely to have been less open to risk and less innovative.

Table 10. *EO Dimensions and CEO Characteristics and Experiences*

	Pro-activeness		Innovativeness		Risk-taking	
	Low	High	Low	High	Low	High
	%	%	%	%	%	%
<b>Age of CEO</b>	No differences					
<b>Age when started first business</b>	No differences					
<b>Number of businesses founded</b>	No differences					
<b>Parent entrepreneur</b>			**	**		
Yes			31.3	47.0		
Total			67	66		
<b>Diversity of prior experience</b>	No differences					
<b>Prior sales/marketing experience</b>	No differences					
<b>Prior R&amp;D work experience</b>					*	*
Yes					27.9	45.0
Total					61	40
<b>Worked in Research Base</b>			**	**		
Yes			17.4	36.6		
Total			46	52		
<b>Qualifications</b>			**	**	**	**
No tertiary			45.5	24.2	40.9	21.7
Degree level			27.3	33.9	31.8	30.4
Post graduate qual.			27.3	41.9	27.3	47.8
Total			55	62	66	46

(\*\*p < 0.05 \* p < 0.1)

## 6. Entrepreneurs' objectives and intentions

With the exceptions noted above there was little evidence that the background of the CEO had a marked impact on the pro-active, innovative or risk-taking behaviour displayed by his/her firm. Does this point to EO being outside of the influence of the CEO in small high-tech businesses? While background may not be important the objectives and intentions that entrepreneurs hold may have a greater influence. Three types of objectives held by entrepreneurs are likely to shape the actions of their organizations:

- reasons for starting a business
- personal objectives for the self and the business
- growth objectives

### 6.a Starting the Business

Respondents to the 1998 survey were asked to rate 16 reasons for starting a business in terms of their importance using a 3-point Likert scale: “insignificant”, “significant” and “crucial”. Factor analysis suggested 5 underlying groups:

- Autonomy and material advancement
- Personal and family enjoyment
- Perception of opportunities
- Exercise and development of skills
- Altruism

The three most important individual reasons for starting the business given were ‘*a strong future seen for this*’ (perception of opportunity), ‘*to be my own boss*’ (autonomy/advancement) and ‘*something worthwhile investing my energy in*’ (altruism). Higher levels of support for reasons to do with increasing income, getting on in the world and managing a business meant that overall autonomy and advancement reasons were the most strongly supported. Such reasons for starting a business are universal. Together with reasons related to personal and family happiness and the exercise and development of personal skills they are likely to be equally strongly held by lifestyle entrepreneurs as those seeking to create growth-oriented businesses. By and large this is reflected in the results. No marked differences were found between CEOs of businesses judged to differ in levels of EO in respect of reasons for starting the business related to autonomy and

advancement or the exercise of personal skills and only minor differences in respect of reasons relating to personal and family happiness.

Table 11. *Reasons for starting the business*

<b>Reasons</b>	<b>N</b>	<b>Mean</b>	<b>S. D.</b>
<b>Autonomy and material advancement (mean scores)</b>	<b>113</b>	<b>2.14</b>	<b>0.6360</b>
To be my own boss	118	2.39	0.74
To increase my income	112	2.07	0.78
To get on in the world	110	2.02	0.87
To manage a business	109	2.01	0.80
<b>Personal and Family Enjoyment (mean score)</b>	<b>109</b>	<b>2.00</b>	<b>0.6718</b>
To enjoy my life	111	2.13	0.76
For the happiness of my family	113	1.92	0.76
<b>Perception of Opportunity (mean score)</b>	<b>114</b>	<b>1.92</b>	<b>0.6038</b>
Saw a strong future in this work	116	2.43	0.68
To provide a new service	109	1.78	0.82
To commercialise existing technology	107	1.73	0.80
To commercialise a new technology	111	1.73	0.84
<b>Exercise and development of skills(mean score)</b>	<b>110</b>	<b>1.77</b>	<b>0.5635</b>
To use own technical skills	111	1.88	0.74
To use own marketing skills	109	1.72	0.71
To use own management skills	109	1.70	0.73
<b>Altruism (mean score)</b>	<b>109</b>	<b>1.75</b>	<b>0.4836</b>
To do something worthwhile	112	2.39	0.68
To do something useful for society	109	1.50	0.65
For the development of science & technology	110	1.38	0.61

Marked and statistically significant differences were found in the importance placed on perception of opportunity as a reason for starting the business between CEOs of businesses demonstrating more innovative, pro-active and risk-taking behaviour. In particular businesses judged to have been highly pro-active, were far more likely to have been founded by people seeking to commercialise new technology. Interestingly differences also emerged in the importance placed on altruistic reasons, however this was related to the evaluation of ‘*contributing to science and technology*’.

Table 12. *EO Dimensions and Reasons for Starting the Business*

Reasons for starting the business (Mean Scores)	Pro-activeness		Innovativeness		Risk-taking	
	Low	High	Low	High	Low	High
<b>Personal enjoyment</b>						
To enjoy my life						
For the happiness of my family	2.03	1.78 *				
<b>Perception of opportunity</b>						
Saw strong future in this work			1.71	2.08 ***	1.78	2.09 ***
To provide a new service			2.27	2.57 **	2.31	2.54 *
To commercialise existing technology	1.58	1.86 *	1.63	1.91 *	1.60	1.93 **
To commercialise a new technology	1.43	2.02 ****	1.46	1.96 ***	1.48	2.00 ***
<b>Altruistic reasons</b>						
To do something worthwhile investing my energy in	1.63	1.86 **	1.61	1.88 ***	1.68	1.84 *
To do something useful for society			1.37	1.64 **		
For the development of science & technology	1.16	1.57 ****	1.17	1.55 ***	1.28	1.49 *

(\*\*\*\* p =< 0.001, \*\*\* p=<0.01, \*\* p =< 0.05, \* p=<0.1)

## 6.b Personal Objectives

Respondents to the 2001 survey were asked to rate the importance of 12 personal objectives on a 5-point Likert scale ranging from ‘not at all’ to ‘crucial’. Factor analysis suggested 4 main groups for 10 of the objectives: reflecting an ‘Enterprise Focus’, concerned with ‘Personal Satisfaction’, concerned with ‘Financial Returns’ and two objectives which received little support but may reflect an ‘Idealised Technology Business Focus’.

Table 13. *Personal Objectives*

<b>Personal objectives</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>
<b>Enterprise focus</b>		<b>4.26</b>	<b>0.662</b>
Build a business with a reputation for excellence	129	4.60	0.68
Provide a positive/stable environment for employees	130	4.08	0.82
Build a business that can exist without me	131	4.09	1.05
<b>Personal satisfaction focus</b>		<b>4.01</b>	<b>0.656</b>
Conduct business on the basis of fairness and moral integrity	132	4.32	0.77
To maximize my enjoyment and satisfaction from work	131	4.22	0.83
To maintain my personal involvement	130	3.51	1.02
<b>Financial focus</b>		<b>3.49</b>	<b>1.043</b>
Maximise current and future returns for the owners	127	3.60	1.21
Increase the value of the business for potential capital gains	129	3.40	1.21
<b>Idealised technology business focus</b>		<b>2.13</b>	<b>0.934</b>
To contribute to the development of science and technology	131	2.58	1.29
To prepare the business for future stock exchange/AIM listing	129	1.72	1.06
Enable people to maintain a balance between work and home	129	3.81	0.83
Build a business which contributes to the well-being of society	131	3.21	1.13

The top five individual objectives receiving most support were ‘*to build a business with a reputation for excellence*’ (Enterprise Focus), ‘*conduct business on the basis of fairness and moral integrity*’ and ‘*maximize my enjoyment and satisfaction from work*’ (both Personal Satisfaction) and ‘*build a business which can exist without me*’ and ‘*provide a positive and stable environment for employees*’ both Enterprise Focus. Overall the strongest level of support was found for objectives reflecting an Enterprise Focus followed by those relating to Personal Satisfaction.

Table 14. *EO Dimensions and Personal Objectives*

Personal objectives (Mean scores)	Pro-activeness		Innovativeness		Risk-taking	
	Low	High	Low	High	Low	High
<b>Enterprise focus</b>			4.13	4.39 **		
Provide a positive/stable environment for employees			3.93	4.26 **		
Build a business that can exist without me	3.90	4.30 **	3.93	4.26 *		
<b>Financial focus</b>			3.34	3.65 *	3.37	3.70 *
Maximise current and future returns for the owners					3.27	3.63 *
Increase the value of the business for potential capital gains	3.23	3.64 **	3.24	3.59 *		
<b>Idealised technology business focus</b>	1.80	2.53 ****	1.7	2.58 ****	1.94	2.37 ***
To contribute to the development of science and technology	2.01	3.14 ****	1.94	3.14 ****	2.28	2.86 ***
To prepare the business for future stock exchange/AIM listing	1.58	1.94 **	1.45	2.04 ***		
Build a business which contributes to the well-being of society			2.96	3.46 ***		
<b>Ownership Group</b>	%	%	%	%	%	%
				**		
Sole/proxy sole proprietor			35.5	22.7		
Internal ownership			43.5	31.8		
Some external ownership			21.0	45.5		
Total			62	66		

(\*\*\*\* p < 0.001, \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1)

Differences were found in the importance ascribed to personal objectives by CEOs of business differing in EO. As indicated, objectives that can be seen as reflecting concern for the enterprise and in particular those relating to the environment for employees and the existence of the business beyond the CEO's personal involvement, were among the most strongly held. But CEOs of businesses that had demonstrated high levels of innovativeness and more pro-activeness ascribed significantly higher levels of support to these objectives. This stronger enterprise as opposed to purely personal focus may also be reflected in the finding that the ownership of more innovative businesses was more dispersed to include external owners.

CEOs of businesses demonstrating higher levels of EO were also more likely to give higher levels of support for financial objectives. However the largest differences were found in respect of the objects relating to contributing to science and technology and preparing the business for IPO<sup>7</sup>. Businesses which had been more innovative, pro-active and more open to risk appeared to be headed by CEOs more committed to advancing science and technology and to a lesser extent who held, as a long term goal, the objective of stock exchange floatation. Interest in, and commitment to, new technology appeared to carry over from being a reason for founding to current objectives for CEOs of more innovative and pro-active businesses. As did the differential found in respect of altruistic concerns.

### 6.c Growth objective

In contrast to much that has been written about small firms in general the majority of the high-tech small businesses in this study sought growth (Storey, 1994). The principal difference lay in whether ‘moderate’ or ‘substantial’ growth was sought.

Table 15. *Growth Objective*

<b>Growth objective</b>	<b>Frequency</b>	<b>Percent</b>
No growth	23	16.4
Moderate growth	64	45.7
Substantial growth	53	37.9
<b>Total</b>	<b>140</b>	<b>100.0</b>

As can be seen the desired level of growth sought by CEOs was very strongly positively related to the innovative and pro-active behaviour displayed by their businesses. In particular very few CEOs of businesses judged to have been highly pro-active were aiming for no growth.

Table 16. *EO Dimensions and growth objective*

	<b>Pro-activeness</b>		<b>Innovativeness</b>		<b>Risk-taking</b>	
	<b>Low</b>	<b>High</b>	<b>Low</b>	<b>High</b>	<b>Low</b>	<b>High</b>
<b>Growth objective</b>	****		****		**	
	%	%	%	%	%	%
No growth	27.1	4.4	26.1	7.1	22.1	7.1
Moderate growth	51.4	39.7	50.7	40.0	41.6	50.0
Substantial growth	21.4	55.9	23.2	52.9	36.4	42.9
<b>Total</b>	<b>70</b>	<b>68</b>	<b>69</b>	<b>70</b>	<b>78</b>	<b>57</b>

(\*\*\*\* p =< 0.001, \*\*\* p=<0.01, \*\* p =< 0.05, \* p=<0.1)

## Conclusions

This paper sought to examine the innovativeness, pro-activeness and willingness to take risk demonstrated by a group of high-tech small firms and to assess the extent to which such behaviour was related to the objectives and intentions held by their CEOs. The approach adopted departed from that normally used to assess EO by focusing on reported behaviours. Questions for further research remain as to the extent to which the normal instruments used are reflected in activities such as innovation, R&D and collaboration. The personal characteristics and experiences of CEOs appeared to have little impact on how their businesses behaved but their intentions and objectives did. The findings were generally stronger in respect of innovative and pro-active than risk-taking behaviour.

More innovative and pro-active businesses were more likely to have been founded by entrepreneurs with a clear perception of an opportunity related to the commercialization of a new or existing technology, to hold personal objectives reflecting an enterprise focus: with a concern for employees, and a perception of the business as an entity existing outside of and beyond themselves and who aimed for substantial growth.

Both in respect of reasons for starting the business and what they were currently seeking to do the CEOs of more entrepreneurially oriented businesses regarded technology as more important than their counterparts in less entrepreneurially oriented businesses. The findings provide support for the notion of 'technology policy' as being important in relation to innovativeness in particular. Zahra and Covin (1993) expressed this as the firm's 'commitment to acquiring, developing and employing technology'.

The importance to innovation of a personal 'technology policy' has implications for national policy, not only in terms of how to foster such a perspective but also in terms of the potential impact of developments in secondary and tertiary education. The growth of entrepreneurship courses in general and in particular those aimed at technical/scientific graduates is an important positive development. But at the same time the numbers of students opting to take science and technology subjects at tertiary level needs to be encouraged otherwise the pool of potential entrepreneurs committed to and enthusiastic about technology will diminish.

Pro-activeness in competition, innovativeness and willingness to take risks are increasingly seen as crucial activities in the development of competitiveness by all types of business but for technology and high value added businesses they are arguably even more important. Not all firms are equally innovative, pro-active or open to risk. This paper sought to shed some light on the possible factors influencing these activities within the context of small high-tech businesses in which founder(s) strongly shape business activity.

## Notes

- <sup>1</sup> These were defined according to Butchart (1987).
- <sup>2</sup> Sole founders were situations where the respondent alone held 100% of the equity, proxy sole founders were businesses in which the only other shareholder was the respondent's spouse. Externally owners were those not actively involved in running the businesses.
- <sup>3</sup> Firms engaged in 'routine computer bureau services' were not included in the study.

<sup>4</sup>

<b>Median</b>	<b>Age</b>	<b>Turnover (£s Million)</b>	<b>Employment</b>
Manufacturing	22	2.0	32
CST	13	1.3	17
RDT	14	0.4	9

- <sup>5</sup> Mean annual growth: 34.9% sd 49.7% and mean employment growth 21.1% sd 14.7.
- <sup>6</sup> The average annual growth in turnover recorded by firms with turnovers of less than £1million was 55% compared to 32% for firms with turnovers over £1 million. Similarly firms employing less than 20 had expanded employment by on average 32% as compared to between 20% and 16% in larger firms.
- <sup>7</sup> Although not a realistic option today it was at the time of the 2001 survey.

## References

- Acs, Z. J. and Audretsch, D. B. 1999, *Small Firms and Entrepreneurship: An East-West Perspective*, Cambridge University Press, Cambridge.
- Acs, Z. J., Carlsson, B. and Karlsson, C. (eds.) 1999, *Entrepreneurship, Small and Medium-Sized Enterprises in the Macroeconomy*, Cambridge University Press, Cambridge.
- Ajzen, I., 1991, 'Theory of planned behavior' *Organisational Behaviour and Human Decision Processes*, **50**, 170-211.
- Bagozzi, R., Baumgartner, H. and Yi, Y. 1989, 'An investigation into the role of intentions as mediators of the attitude-behavior relationship' *Journal of Economic Psychology*, **10** 35-62.
- Barnett, E. and Storey, J. 2000, 'Managers' accounts of innovation processes in small and medium-sized enterprises' *Journal of Small Business and Enterprise Development*, **7**, (4) 315-324
- Briggs, S. and Keogh, W., 1999, 'Integrating Human Resource Strategy and Strategic Planning to Achieve Business Excellence' *Total Quality Management*, **10**, 4/5, 447-454.
- Brown, T. E., Davidsson, P. and Wiklund, J., 2001, 'An operationalisation of Stevenson's conceptualization of entrepreneurship as opportunity-based firm behavior', *Strategic Management Journal*, **22** 953-968.
- Butchart, R. L. 1987, 'A new UK Definition of the high Technology Industries' *Economic Trends*, No. 400, February.
- Cooper, A. C. and Gascon, F., 1992 'Entrepreneurs, processes of founding and new-firm performance', in *The state of the art of entrepreneurship*, (eds.) D Sexton and J Kasarda, PWS-Kent, Boston.
- Cosh, A., Hughes, A, and Wood, E., 1996 'Innovation in UK SMEs: Causes and consequences for firm failure and acquisition' ESRC Centre for Business Research Working Paper No. 48, University of Cambridge, Cambridge.
- Covin, J. G. and Slevin, D. P., 1986 'The development and testing of an organization-level entrepreneurship scale', in *Frontiers of Entrepreneurship Research*, (eds.) R Ronstadt, J. A. Hornaday, R. Peterson and K. H. Vesper M.A. Babson College, Wellesley.
- 1989 'Strategic management of small firms in hostile and benign environments' *Strategic Management Journal*, **10**, 75-87.
- (1991). "A Conceptual Model of Entrepreneurship as Firm Behaviour." *Entrepreneurship Theory and Practice* **16**(1): 7-25.

- Covin, J. G., Slevin, D. P. and Schultz, R. L. 1994, 'implementing strategic missions: Effective strategic, structural and tactical choices.' *Journal of Management Studies*, **31** (3) 481-505.
- DTI, 2001 'UK Competitiveness Indicators' Second Edition HMSO London.
- Gasse, Y., 1982, 'Elaborations on the psychology of the entrepreneur', in *Encyclopaedia of Entrepreneurship*, (eds.) C. Kent, D. Sexton and K. Vespers, Prentice Hall, Englewood Cliffs, NJ
- Hannan, M. T., Burton, D. and Baron, J., 1996 'Inertia and Change in the Early Years: Employment Relations in Young, high Technology Firms', *Industrial and Corporate Change*, **5** 503-536.
- Khandwalla, P.N., 1977 *The Design of Organizations*, Harcourt Brace Jovanovich, New York.
- Krueger, N. F., Reilly, M. D. and Carsrud, A. L., 2000, 'Competing models of entrepreneurial intentions', *Journal of Business Venturing* **15** 411-432.
- Kitson, M and Wilkinson, S. F. 2000 'Markets, Competition and Collaboration' in *British Enterprise in Transition*, (eds.) A. Hughes and A. Cosh, ESRC Centre for Business Research, University of Cambridge, Cambridge
- Loveman, G. and Sengenberger, W, 1991, 'The Re-emergence of Small Scale Production: An International Comparison' *Small Business Economics*, **3** (1) 1-39.
- Miller, D. 1983, 'The correlates of entrepreneurship in three types of firms', *Management Science*, **29**, (7) 770-791.
- Miller, D. and Friesen, P 1983, 'Strategy making and environment: The third link' *Strategic Management Journal*, **4**, 221-235.
- Norton, W. I. And Moore, W. T. 2002, 'Entrepreneurial Risk: Have we been asking the wrong questions', *Small Business Economics* **18** (4) 281-288.
- Phillips, B. D. 1991, 'The Increasing Role of Small Firms in the High Technology Sector: Evidence from the 1980s' *Business Economics*, 40-47
- Rotter, J.B., 1966, 'Generalised expectancies for internal versus external control of reinforcement', *Psychological Monograph*, 80, 1-28.
- Smart, D.T and Conant, J. S., 1994, 'Entrepreneurial orientation, distinctive marketing competencies and organisational performance', *Journal of Applied Business Research*, **10** (3) 28-38.
- Storey, D. J. 1994, *Understanding the Small Business Sector*, London, Routledge.
- Voss, C., Blackman, K. L. Caglian, R., Hanson, P and Wilson, F., 1998, 'Made in Europe: Small Companies', *Business Strategy Review*, **9** (4) 1-19.
- Wren, C., 2001, 'The Industrial Policy of Competitiveness: A Review of Recent Development in the UK', *Regional Studies*, **35** (9) 847-860.

- Zahra, S. A. 1991, 'Predictors and financial outcomes of corporate entrepreneurship: An exploratory study', *Journal of Business Venturing*, **6** 259-285.
- Zahra, S. A., and Covin, J. G., 1993, 'Business strategy, technology policy and firm performance', *Strategic Management Journal*, **14**, 451-478.
- Zahra, S. A., and Covin, J. G., 1995, 'Contextual influences on the corporate entrepreneurship-performance relationship: A longitudinal analysis', *Journal of Business Venturing*, 10, 43-58.